

## 2026 PROGRAMS



ENGINEERING



ONCOLOGY



MULTISPECIFICS



IMMUNOTHERAPY



EXPRESSION



ANALYTICAL



IMMUNOGENICITY



EMERGING THERAPEUTICS



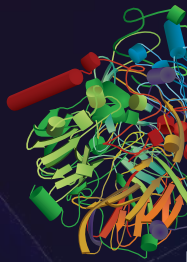
MACHINE LEARNING



SHORT COURSES



Training SEMINARS



22<sup>ND</sup> ANNUAL

# PEGS BOSTON

MAY 11-15, 2026 | BOSTON, MA + VIRTUAL  
OMNI HOTEL BOSTON AT THE SEAPORT

The Essential Protein & Antibody Engineering Summit



### PLENARY KEYNOTE

CARs 2026: New Models and New Runway

MICHEL SADELAIN, MD, PhD  
Columbia University Irving Medical Center

### PLENARY FIRESIDE CHAT

How to Think About Designing Smart Biologics in the Age of GenAI:  
Integrating Biology, Technology, and Experience



Moderator:  
Christopher J.  
Langmead, PhD,  
Amgen



Panelists:  
Surge Biswas, PhD,  
Nabla Bio, Inc.



Rebecca  
Croasdale-Wood PhD,  
AstraZeneca



Joshua Meier, PhD,  
Chai Discovery



Maria Wendt, PhD,  
Sanofi

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TABLE OF CONTENTS

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## Welcome to PEGS Boston

The PEGS Boston Summit is where the future of biologics takes shape. For over 20 years, PEGS is the go-to event for protein and antibody engineering, drug development, immunotherapy, radiotherapy, and AI/ML-driven biologics research. New in 2026: a dedicated focus on peptides, spotlighting their therapeutic power, design innovations, and expanding role in drug discovery.

With 350+ presentations, breakout sessions, and interactive training seminars, PEGS delivers the insights and connections you need to stay ahead. The exhibit hall buzzes with top technology and service providers, giving you a front-row seat to the tools transforming the industry.

Don't just follow the science—be part of it. Join us at the 2026 PEGS Boston Summit and connect with the leaders shaping what's next in biologics and beyond.

[VIEW CONFERENCE AT-A-GLANCE](#)

[VIEW PLENARY KEYNOTE SPEAKERS](#)

[VIEW POSTER SUBMISSIONS](#)

[VIEW 2026 SPONSORS](#)

[VIEW MEDIA PARTNERS](#)

[VIEW SPONSOR & EXHIBIT INFORMATION](#)

[VIEW VENUE & TRAVEL INFORMATION](#)

[VIEW REGISTRATION INFORMATION](#)

## 2026 CONFERENCE PROGRAMS

### ENGINEERING [VIEW](#)

- Display of Biologics
- Engineering Antibodies
- Machine Learning for Protein Engineering

### MULTISPECIFICS [VIEW](#)

TRAINING SEMINAR:

- Intro to Multispecific Antibodies
- Advancing Multispecific Antibodies
- Engineering Bispecific and Multispecific Antibodies

### EXPRESSION [VIEW](#)

- Difficult-to-Express Proteins
- Optimizing Protein Expression
- Maximizing Protein Production Workflows

### EMERGING THERAPEUTICS [VIEW](#)

- Biologics for Autoimmune Diseases
- Frontiers in Radiopharmaceutical Therapy
- Emerging Peptide Therapeutics

### MACHINE LEARNING [VIEW](#)

- ML and Digital Integration in Biotherapeutic Analytics
- Predicting Immunogenicity with AI/ML Tools
- Machine Learning for Protein Engineering

### ONCOLOGY [VIEW](#)

- Antibodies for Cancer Therapy
- Emerging Targets for Oncology and Beyond
- Antibody-Drug Conjugates

### IMMUNOTHERAPY [VIEW](#)

- Emerging T Cell Engagers
- Advances in Immunotherapy
- Next-Generation Immunotherapies

### ANALYTICAL [VIEW](#)

- ML and Digital Integration in Biotherapeutic Analytics
- Biophysical Methods
- Characterization for Novel Biotherapeutics

### IMMUNOGENICITY [VIEW](#)

TRAINING SEMINAR:

- Introduction to Immunogenicity
- Predicting Immunogenicity with AI/ML Tools

TRAINING SEMINAR:

- Bioassay Development and Analysis

### SC SHORT COURSES

### Training SEMINARS

## ELEVATE YOUR PROTEIN & ANTIBODY ENGINEERING RESEARCH

### 2026 PROGRAMS

- ENGINEERING**
- ONCOLOGY**
- MULTISPECIFICS**
- IMMUNOTHERAPY**
- EXPRESSION**
- ANALYTICAL**
- IMMUNOGENICITY**
- EMERGING THERAPEUTICS**
- MACHINE LEARNING**

SUNDAY  
MAY 10

PRE-CONFERENCE SHORT COURSES

TUESDAY  
MAY 12

DINNER SHORT COURSES

#### PART A

MONDAY -  
TUESDAY AM (MAY 11-12)

Display of Biologics
Antibodies for Cancer Therapy
TS: Introduction to Multispecific Antibodies
Emerging T Cell Engagers
Difficult-to-Express Proteins
ML and Digital Integration in Biotherapeutic Analytics
TS: Introduction to Immunogenicity
Biologics for Autoimmune Diseases
ML and Digital Integration in Biotherapeutic Analytics

#### PART B

TUESDAY PM -  
WEDNESDAY (MAY 12-13)

Engineering Antibodies
Emerging Targets for Oncology & Beyond
Advancing Multispecific Antibodies and Combination Therapy to the Clinic
Advances in Immunotherapy
Optimizing Protein Expression
Biophysical Methods
Predicting Immunogenicity with AI/ML Tools
Frontiers in Radiopharmaceutical Therapy
Predicting Immunogenicity with AI/ML Tools

#### PART C

THURSDAY – FRIDAY AM  
(MAY 14-15)

Machine Learning for Protein Engineering
Driving Clinical Success in Antibody-Drug Conjugates
Engineering Bispecific and Multispecific Antibodies
Next-Generation Immunotherapies
Maximizing Protein Production Workflows
Characterization for Novel Biotherapeutics
TS: Bioassay Development & Analysis
Emerging Peptide Therapeutics
Machine Learning for Protein Engineering

### Training SEMINARS

By Cambridge Healthtech Institute

TS3A: Introduction to Multispecific Antibodies: History, Engineering, and Applications

TS7A: Introduction to Immunogenicity

TS9A: Introduction to Machine Learning for Biologics Design

TS10A: Introduction to Protein Engineering

TS11A: Antibody Drug Discovery: From Target to Lead

TS9B: AI-Driven Design of Biologics: A Hands-On Guide to Using State-of-the-Art ML Protein Models

TS10B: Introduction to Antibody-Drug Conjugate Design: Targets, Payloads, and Linkers

TS7C: Bioassay Development and Analysis

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MONDAY, MAY 11 - 4:15 - 5:55 PM

## PLENARY KEYNOTE



### CARs 2026: New Models and New Runways

**MICHEL SADELAIN, MD, PHD**

Director, Columbia University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center

WEDNESDAY, MAY 13 - 8:25 - 9:15 AM

## PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL

### Innovation in Protein Science with Young Scientist Visionaries



MODERATOR:

**JAMES A. WELLS, PHD**

Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco



PANELIST:

**MARTIN PACESA, PHD**

Assistant Professor, Pharmacology, University of Zurich



PANELIST:

**JAMIE SPANGLER, PHD**

Associate Professor, Johns Hopkins University



PANELIST:

**KIPP WEISKOPF, MD, PHD**

Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center



PANELIST:

**TIMOTHY WHITEHEAD, PHD**

Professor, University of Colorado



PANELIST:

**XIN ZHOU, PHD**

Assistant Professor, Harvard Medical School

## YOUNG SCIENTIST KEYNOTE



### Deep Learning-Based Binder Design to Probe Biology

**MARTIN PACESA, PHD**

Assistant Professor, Pharmacology, University of Zurich

THURSDAY, MAY 14 11:35 AM - 12:35 PM

## PLENARY FIRESIDE CHAT

### How to Think about Designing Smart Biologics in the Age of GenAI:

Integrating Biology, Technology, and Experience



MODERATOR:

**CHRISTOPHER J. LANGMEAD, PHD**

Executive Director, AI & Data for Engineered Biologics, Amgen



PANELIST:

**SURGE BISWAS, PHD**

Founder & CEO, Nabla Bio, Inc.



PANELIST:

**REBECCA CROASDALE-WOOD, PHD**

Senior Director, Augmented Biologics Discovery & Design, Biologics Engineering, Oncology, AstraZeneca



PANELIST:

**JOSHUA MEIER, PHD**

Co-Founder, Chai Discovery



PANELIST:

**MARIA WENDT, PHD**

Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi

\*Separate registration required.

SUNDAY, MAY 10 2:00-5:00 PM

### SC1: In silico and Machine Learning Tools for Antibody Design and Developability Predictions

Instructors:

Clare Gillis, DPhil Student in Statistics, University of Oxford

Mani Jain, Principal Data Scientist, Amgen Inc

Vinodh B. Kurella, PhD, Research Scientific Associate Director, Global Biologics, Takeda Pharmaceuticals, Inc.

Valentin Stanev, PhD, Associate Principal Data Scientist, AstraZeneca

Given the exciting pace in the evolution of machine learning tools towards antibody design and developability predictions, we plan to present an overview in this field specificity geared towards antibody design and developability predictions. There will be a live demo as well as few ML tools.

### SC3: Challenges and Opportunities in Solid Tumor and Autoimmune Disease Therapeutics

Instructor:

Tony R. Arulanandam, DVM, PhD, CEO and Founder, Synaptimmune Therapeutics

This course offers advanced insights into developing next-generation immunotherapies for solid tumors and autoimmune diseases, focusing on identifying new targets, therapeutic methods, and emerging biology. It includes detailed analyses of the solid tumor microenvironment and the autoimmune diseases space, addressing challenges and showcasing successful therapeutic strategies across T cell engagers, blocking bispecific antibodies, ADCs, CAR-Ts, radioligand therapy and targeted protein degraders.

### SC4: Unlocking Immunity: Mastering Epitope Analysis and Prediction with IEDB and CEDAR Tools & Insights

Instructors:

Ibel Carri, PhD, Postdoctoral Fellow, La Jolla Institute for Immunology

Lindy Edwards, Document Specialist, La Jolla Institute for Immunology

This short course offers an in-depth introduction to the Immune Epitope Database and Analysis Resource (IEDB) and Cancer Epitope Database and Analysis Resource (CEDAR), designed to help scientists harness their full potential for immunological research. Participants will receive two focused presentations—one on navigating the IEDB (<https://iedb.org/>) and CEDAR ([cedar.iedb.org](https://cedar.iedb.org)) databases and another on using powerful prediction

and analysis tools, including both the classic Analysis Resource (<http://tools.iedb.org/main/>) and the cutting-edge Next-Generation Tools (<https://nextgen-tools.iedb.org/>). The course will feature live demonstrations to guide attendees through real-world applications of these resources, empowering them to integrate epitope data and predictive modeling into their own research workflows.

### SC5: Safety & Efficacy of Bispecifics and ADCs

Instructor:

Rakesh Dixit, PhD, DABT, CEO & President, Bionavigen Oncology, LLC; CSO, TMAB Therapeutics, Regio Biosciences

Bispecific immunotherapies and ADCs are the two most rapidly advancing therapeutics in the war against cancer. However, efficacy and safety challenges limit their therapeutic effectiveness in resistant and refractory cancers. The short course will discuss five rights of the targets, effector arms, and constructs for attaining the best therapeutic index for bispecifics and ADCs. Special focus will be on attaining the best efficacy with minimal toxicities.

TUESDAY, MAY 12 6:30-9:00 PM

### SC6: Developability of Bispecific Antibodies

Instructor:

Nimish Gera, PhD, Founder and Principal Consultant, MABS R US Consulting

Bispecific antibodies are a rapidly growing and clinically validated class of antibodies with marketed drugs and multiple candidates in clinical trials. Targeting multiple antigens in a synergistic manner can confer enhanced therapeutic benefit and potentially uncover novel biological mechanisms. However, multiple formats and a tedious candidate selection process to select functional and developable bispecific antibodies makes such programs cumbersome. This short course highlights the rapid growth in the field, therapeutic applications, and focuses on challenges with discovery and development of bispecific antibodies. We will use an approved bispecific antibody as a case study to understand the varied aspects of discovery and development of bispecific antibody programs.

### SC7: Targeting the Target: Aligning Target and Biologic Format Biology to Achieve Desired Outcomes

Instructor:

Tariq Ghayur, PhD, Tariq Ghayur Consulting, LLC; Entrepreneur in Residence, FairJourney Biologics

Receptor–ligand interactions have co-evolved to maintain specificity of downstream signaling. However, biologics are not natural ligands and, therefore, different biologics to the same target (receptor or ligand) can have distinct outcomes. Recent advances in various high-throughput analytical technologies, biologic-based therapeutic formats, and our understanding of disease heterogeneity are & will challenge us to “re-evaluate” our discovery and development paradigm(s). In this course we will explore, with examples, potential avenues on how to apply these new technologies/understanding to select “better” lead candidates to achieve “better” desired outcomes.

### SC8: The Dark Proteome: Unlocking Novel Targets for Next-Generation Biologics

Instructor:

Sudhakaran Prabakaran, Co-Founder & CEO, NonExomics

The dark proteome—comprising over 250,000 novel proteins from noncoding regions—represents an untapped frontier for therapeutic discovery. This course provides protein engineers and drug developers frameworks to identify and exploit dark antigens: cryptic, noncanonical, and post-translationally modified epitopes that enable novel-binding interfaces. Participants will learn AI-driven discovery methods, target validation strategies, and design principles for engineering biologics against hidden epitopes, with applications across oncology, infectious disease, and autoimmunity.

### SC9: Automation in Action: Hands-on, Liquid Handling for Protein & Antibody Engineering

Instructors:

Curtis Walton, PhD, Director of Automation and Process Optimization, Institute for Protein Innovation

Eloy Salinas, Senior Lab Automation Engineer, Institute for Protein Innovation

This short course introduces the principles, techniques, and key considerations of automated liquid handling. Participants will learn how to develop and optimize an automated assay through an interactive experience and live demonstration. The course is offered by experts from the Institute for Protein Innovation (IPI), a leader in applying cutting-edge automation to advance protein science. Participants are encouraged but not required to attend Friday off-site hands-on session.

Please note: \*A laptop is required to participate

# Training SEMINARS

MONDAY, MAY 11, 2026 8:30 AM - 6:00 PM  
TUESDAY, MAY 12, 2026 8:30 AM - 12:45 PM

## TS3A: Introduction to Multispecific Antibodies: History, Engineering, and Applications

Instructor:

G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company

Introduction to Multispecific Antibodies is an informative and practical guide to getting up to speed on critical aspects of multispecific antibody therapeutics. Topics will include historical successes, failures, and lessons learned. Specific practical instruction will span mechanisms of action, engineering, developability, regulatory considerations, and translational guidelines. Perspectives on ideal implementation of multispecifics as targeted and immunomodulatory approaches will be discussed.

## TS7A: Introduction to Immunogenicity

Instructors:

Chloé Ackaert, PhD, Senior Scientist, Immunogenicity, IQVIA Laboratories

Timothy Hickling, PhD, Consultant, Quasor Ltd.

Sofie Pattyn, Founder & CTO, IQVIA Laboratories

This 1.5-day training seminar provides a practical, comprehensive overview of immunogenicity—the causes, how to assess, predict, and prevent, and what to do if you observe immunogenicity during preclinical, clinical, and post-market approval. The seminar begins by detailing the science behind immunogenicity, the latest international guidance, followed by assay and bioanalytical assessment strategies for traditional and emerging biologics. Other topics include predictive models, the role of AI/ML, and reporting immunogenicity.

## TS9A: Introduction to Machine Learning for Biologics Design

Instructors:

Francis Gaudreault, PhD, Associate Research Officer, Human Health Therapeutics, National Research Council Canada

Wanlei Wei, PhD, Research Officer, Computer-Aided Drug Discovery, National Research Council Canada

This course offers an introduction to concepts, strategies, and machine learning methods used for biologics design. It includes presentations and demonstrations of the methods used in the field, covering techniques such as triaging sequences, modulating

affinity, and designing antibody libraries, along with increasing manufacturability. The course is directed at scientists new to the field and protein engineers wanting an introduction to how machine learning can aid in guiding biologics design.

## TS10A: Introduction to Protein Engineering

Instructor:

David Bramhill, PhD, Founder, Bramhill Biological Consulting LLC

This course presents a comprehensive tutorial in the concepts, strategies, and latest tools of protein engineering applied to biotherapeutic research and development, particularly antibody-related products. The class is for scientists new to industry or working in support roles, academics, and protein scientists wanting a detailed update on the current state of the field.

## TS11A: Antibody Drug Discovery: From Target to Lead

Instructor:

Zhiqiang An, PhD, Professor, Robert A. Welch Distinguished University Chair in Chemistry; Director, Texas Therapeutics Institute; Director, CPRIT Core for Antibody Drug Discovery; Vice President, Drug Discovery, University of Texas Health Science Center at Houston

Over 200 antibody-based therapies have been approved for treating almost all major human diseases. Drug modalities include, but are not limited to, mAbs, bispecifics, ADCs, CAR-Ts, antibody-protein fusions, and fragments. Half of the top 20 bestselling prescription medicines in 2024 are antibodies. More than 50% of the new drugs in clinical development are antibody-based. This course will comprehensively review state-of-the-art concepts, methodologies, and trends in therapeutic antibody discovery and development.

TUESDAY, MAY 12, 2026 2:20 PM - 6:10 PM  
WEDNESDAY, MAY 13, 2026 10:00 AM - 6:20 PM

## TS9B: AI-Driven Design of Biologics: A Hands-On Guide to Using State-of-the-Art ML Protein Models

Instructor:

David P. Nannemann, PhD, Vice President, Rosetta Commons Foundation

Since 2021, artificial intelligence models have revolutionized AI-driven biologics development, enabling breakthroughs in structure prediction, sequence design, and protein engineering. This course equips researchers and professionals with the expertise to leverage cutting-edge tools for structure prediction

## Training Seminars Will Be Held In Person Only

To ensure a cohesive and focused learning environment, moving between conference sessions and the training seminars is not allowed

(AlphaFold, ImmuneBuilder), protein engineering with protein language models (ESM, AntiBERTy) and structure-based design (ProteinMPNN and RFDiffusion). Through a blend of lectures and hands-on exercises, participants will learn best practices for tool selection, method optimization, and design selection. By exploring real-world applications and emerging techniques, such as BindCraft and RFAntibody, attendees will gain a practical understanding of performance capabilities, limitations, and effective workflows.

## TS10B: Introduction to Antibody-Drug Conjugate Design: Targets, Payloads, and Linkers

Instructors:

Robert J. Lutz, PhD, CDO, Synthis Therapeutics

L. Nathan Turney, PhD, Associate Professor, Pharmaceutical Sciences, SUNY Binghamton

In this training seminar, your instructors will take you on a journey through the history of ADC technology, the current status of the ADC field, and the most promising up-and-coming technologies that will shape the ADCs of tomorrow. We will place particular emphasis on design principles that can be applied to next generation ADC programs, whether in oncology applications or in a myriad of other therapeutic applications. We will introduce various assay strategies, experimental approaches, and technical insights that will enable participants to have both a practical and a theoretical understanding of the inner-workings of a successful ADC program. Your instructors are seasoned ADC experts that have been involved in numerous ADC programs in academia, in big pharma, and in biotechnology companies.

THURSDAY, MAY 14, 2026 8:30 AM - 5:40 PM  
FRIDAY, MAY 15, 2026 8:30 AM - 12:15 PM

## TS7C: Bioassay Development and Analysis

Instructor:

Steven Walfish, Principal CMC Statistician, Iovance Biotherapeutics

This course will focus on factors to be considered in the design, development, and validation of bioassays. The course introduces terminology and important statistical tools and best practices. Examples and case studies will be provided to help solidify understanding on the topics of design and development, robustness, validation, and post-validation. Relevant pharmacopeial and EUA regulations will be highlighted.

# ENGINEERING STREAM

## Engineering Novel Biologics with Precision Targeting

The Engineering Stream at the PEGS Boston Summit brings together leaders in protein and antibody engineering to highlight novel discovery platforms and their applications, enabling precision targeting and conditional activation, and approaches combining experimental with *in silico* methods. Be informed of the latest trends and technologies to gain insights into strategies to improve the function and targeting of antibodies.



ENGINEERING  
STREAM  
CONFERENCES

MAY 11-12

## Display of Biologics

AGENDA

MAY 12-13

## Engineering Antibodies

AGENDA

MAY 14-15

## Machine Learning for Protein Engineering

AGENDA



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

**SC1: In silico and Machine Learning Tools for Antibody Design and Developability Predictions**

\*Separate registration required. See short course page for details.

## MONDAY, MAY 11

7:00 am Registration and Morning Coffee

8:20 Organizer's Opening Remarks

## NEW TECHNOLOGIES

8:25 Chairperson's Remarks

Andrew R.M. Bradbury, MD, PhD, CSO, Specifica, an IQVIA business

8:30 New Insights into Antibody-Mediated Immunity

Arturo Casadevall, PhD, Professor &amp; Chair, Molecular Microbiology &amp; Immunology, Johns Hopkins University

Antibodies have now been shown to modulate microbial function and to digest microbial antigens through catalytic activity. These findings suggest new ways to harness antibody-mediated immunity in the design of therapeutic immunoglobulins and protective vaccines.

**9:00 KEYNOTE PRESENTATION: History of Checkpoint Blockade Therapy for Cancer**

Nils Lonberg, PhD, CEO, Tripeaks Therapeutics;

Executive in Residence, Canaan Partners

The recent emergence of immunotherapy as a new pillar of cancer treatment is largely due to the success of immune-checkpoint blockade drugs, which block receptors such as CTLA4 and PD1, and ligands, such as PDL1, involved in pathways that attenuate T cell activation. Improvement over the first generation of these drugs was frustratingly slow over the last decade; however, exciting new drugs and combinations are now beginning to appear.

**9:50 FIRESIDE CHAT: Recent Progress and Current Challenges in Checkpoint Blockade Therapy**

Moderator: Andrew R.M. Bradbury, MD, PhD, CSO, Specifica, an IQVIA business

Panelists:

Nils Lonberg, PhD, CEO, Tripeaks Therapeutics; Executive in Residence, Canaan Partners

**10:00 Discovery and Engineering of Highly Selective HLA-A\*03 DARKFOX TCRm x CD3 Engager**

Nikolai Suslov, VP Antibody Div, Antibody Div, Alloy Therapeutics

DARKFOX is a novel tumor antigen arising from an alternative open reading frame of FOXM1. Using ATX-Gx transgenic mice and the KEYWAY™ TCR-mimetic discovery platform, we identified highly selective pMHC-binding antibody clonotypes, confirmed by yeast pHLA Xscan and experimental validation. Leads were affinity-matured via DMS combinatorial libraries and proprietary AI/ML design, then reformatted as bispecific T cell engagers demonstrating potent functional activity *in vitro* and *in vivo*.

**10:30 Networking Coffee Break****11:00 KEYNOTE PRESENTATION: Fifty Years of Monoclonals: From Hybridomas to Next-Generation Antibody Therapeutics**

Paul J. Carter, PhD, Genentech Fellow, Antibody Engineering, Genentech

The invention of hybridoma technology by Köhler and Milstein in 1975 ultimately led to over 200 antibody therapeutics, bringing benefit to millions of patients. This keynote will trace the remarkable rise of antibody therapeutics including bispecifics, antibody-drug conjugates, and CAR T cells. Future progress with antibody therapeutics will surely be accelerated by artificial intelligence, including multi-parameter optimization.

**11:30 A Universal Monoallelic Human Leukocyte Antigen Class II Immunopeptidomic Platform for Defining Therapeutic Protein Immunogenicity Potential**

Robert Siegel, PhD, Vice President, Laboratory for Experimental Medicine, Eli Lilly and Company

Defining the exact sequences presented by HLA Class II molecules is essential for understanding immunogenicity potential of biotherapeutics. HLA heterozygosity complicates connecting the sequences associated with alleles and percentage of patients with potential anti-drug responses. This presentation will describe a diverse, robust, and reproducible monoallelic HLA-DRB1 system in professional antigen-presenting cells capable of examining the immunogenic potential of any human IgG. A case study with adalimumab will be discussed.

**12:00 pm Session Break****12:10 LUNCHEON PRESENTATION: Driving Biologics Discovery with AI and the AtlaX Database**

Barry Duplantis, VP, Business Development, Business Development, Ailux

Ailux is an AI-native biologics innovation company advancing the next generation of biotherapeutics through the seamless integration of data, artificial intelligence, and experimental science. In this presentation, we will describe our end-to-end biologics design platform, anchored on AtlaX, our proprietary biologics database, and driven by state-of-the-art AI models working in concert with specialized wet lab capabilities. We will also showcase how high-throughput experimental data and curated synthetic data can fuel our AI-driven approach to complex antibody discovery and engineering challenges.

**12:40 LUNCHEON PRESENTATION: Automating Antibody Discovery on the Opentrons Flex**

Leslie Mitchell, CSO, Opentrons

Developed by the team behind Sc2.0's synthetic yeast genome, neoSwitch is a yeast strain that flips between surface display and secretion with a simple media change—eliminating antibody reformatting and host switching. Neo offers high-diversity naïve VHH and scFv libraries (>10<sup>9</sup>) for rapid, first-pass discovery, and we routinely design, build, and transform custom libraries for partners. Paired with the Opentrons Flex, neoSwitch enables turnkey, automatable workflows—including protein purification—to accelerate hit-to-lead.

**1:10 Session Break****NAVIGATING EPISTASIS IN PROTEIN ENGINEERING****1:15 Chairperson's Remarks**

K. Dane Witttrup, PhD, C.P. Dubbs Professor, Chemical Engineering &amp; Bioengineering, Massachusetts Institute of Technology

**1:20 Advancements in Machine Learning-Assisted Protein Fitness Optimization**

Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology

Here, I present frameworks for iterative, ML-assisted protein optimization: Active Learning-assisted Directed Evolution (ALDE) and Steered Generation for Protein Optimization (SGPO). Besides showing strong *in silico* performance, three rounds of wet-lab experimentation with ALDE enabled rapid optimization of five

Ailux  
Lighting the Path to Care



epistatic residues in the active site of an enzyme, yielding an ideal variant with a non-obvious (non-additive) combination of mutants.

#### 1:50 The Cause and Consequence of Epistasis in Protein Evolution

*Nobuhiko Tokuriki, PhD, Professor, Michael Smith Laboratories, University of British Columbia*

I will discuss key molecular properties that can be associated with evolvability of proteins, the ability of proteins to promptly evolve a new function. Especially, I will discuss the causes and consequences of mutational epistasis, interactions between mutational effects that affect the pathways and outcomes of evolution.

#### 2:20 AI-Generated Protein-Function Prediction with Therapeutic Applications

*Lucy J. Colwell, PhD, Research Scientist, Google UK Ltd.*

#### 2:50 Presentation to be Announced

#### 3:20 Networking Coffee & Refreshment Break

#### 4:05 Transition to Plenary Keynote Session



### PLENARY KEYNOTE



#### 4:15 Plenary Keynote Introduction

*G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company*



#### 4:25 CARs 2026: New Models and New Runways

*Michel Sadelain, MD, PhD, Director, Columbia University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center*

T cell engineering holds great promise for the treatment of cancers and other pathologies. The original chimeric antigen receptor (CAR) prototypes targeting CD19 are now giving way to further refined receptors endowed with greater sensitivity and combinatorial possibilities. Emerging new targets and engineering tools augur favorably for broadening the use of CAR therapies.

### YOUNG SCIENTIST KEYNOTE



#### 5:10 Deep Learning-Based Binder Design to Probe Biology

*Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich*

Protein-protein interactions are central to biology and drug discovery, yet traditional antibody generation is slow and costly. BindCraft is an open-source, automated computational pipeline for *de novo* protein binder design that routinely yields nanomolar binders with 10-100% experimental success, without high-throughput screening or maturation. We illustrate applications to peptides, cell-surface receptors, allergens, and gene editors, and outline how deep-learning workflows can accelerate next-generation therapeutics, diagnostics, and bioprocessing.

#### 5:55 Welcome Reception in the Exhibit Hall with Poster Viewing

### YOUNG SCIENTIST MEET-UP

#### Young Scientist Meet-Up

*Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University*

*Gian Marco Visani, PhD Graduate Student, University of Washington*

*Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology*

This young scientist meet-up is an opportunity to get to know and network with mentors of the PEGS community.

This session aims to inspire the next generation of young scientists by giving direct access to established leaders in the field.

- Get to know fellow peers and colleagues
- Make connections and network with other institutions
- Discuss the role of mentors and peers role models in the field

#### 7:15 Close of Day

## TUESDAY, MAY 12

#### 7:45 am Registration and Morning Coffee

### ENGINEERING FOR RADIOPHARM AND CHEMOTHERAPY

#### 8:30 Chairperson's Remarks

*Jennifer R. Cochran, PhD, Senior Associate Vice Provost for Research and Macovski Professor of Bioengineering, Stanford University*

#### 8:35 Engineering Cyclotides as Orally Bioavailable Inflammatory Cytokine Antagonists

*K. Dane Wittrup, PhD, C.P. Dubbs Professor, Chemical Engineering & Bioengineering, Massachusetts Institute of Technology*

The first naturally occurring cyclotide, a circularized disulfide-rich protein, was discovered as the active ingredient of a folk medicine brewed as a tea. These small cyclic proteins exhibit remarkable oral bioavailability. Combining this property with antibody-like recognition of arbitrary targets would enable new oral therapeutic modalities for interrupting inflammatory cytokine cascades. We will present our progress in designing pre-immune cyclotide repertoires, minimizing polyspecificity, and accelerating lead optimization.

#### 9:05 Discovery and Development of ECM-Specific Nanobodies for Targeted Radioligand Therapy

*Noor Jailkhani, PhD, CEO & Co-Founder, Matrisome Bio*

We are targeting the disease-associated extracellular matrix or ECM within tumors and metastases, which offers a compelling new therapeutic avenue. This talk will highlight the discovery of high-affinity nanobodies (via phage-display) against ECM proteins and their subsequent engineering as radioisotope carriers, enabling the precise delivery of highly differentiated radioligand therapies.

### EVERYTHING BUT VANILLA IgGs: AN OVERVIEW OF THE RISING THERAPEUTIC POTENTIAL OF PEPTIDES AND VHH

#### 9:35 Chairperson's Remarks

*Andrew Buchanan, PhD, FRSC, Head of Discovery, Stealth Mode Biotech*

#### 9:36 Towards Multi-Specifics by Design: Large-Scale Data Generation Enabling AI-Based Multi-Specific Design

*Norbert Furtmann, PhD, Head, Biologics AI & Design, Large Molecules Research, Sanofi*

The design of multispecific protein therapeutics presents unique challenges that remain largely unaddressed by current computational approaches. We discuss critical data gaps in this field and present strategic approaches for generating fit-for-



purpose datasets specifically tailored for multispecifics. Through practical examples and case studies, we demonstrate how targeted computational and machine-learning strategies can support the optimization of next-generation multispecific therapeutics.

#### 10:05 Talk Title to be Announced

Eric Furfine, CSO, Leadership, Mosaic Biosciences



#### 10:35 Coffee Break in the Exhibit Hall with Poster Viewing

#### EVERYTHING BUT VANILLA IgGs (Cont.)

#### 11:15 Bicycle Molecules as Precision Guided Therapeutics, from Libraries to Leads and Beyond

Katie Gaynor, PhD, Principal Scientist, Bicycle Therapeutics

Bicycle's proprietary phage display-screening platform uses synthetic biology to rapidly screen large libraries of chemically-stabilised bi-cyclic peptides against a wide spectrum of targets, including those which conventional small molecules and biologics have not proven optimal. High-quality hits are chemically optimized using structural and computation tools into leads with drug-like properties. Conjugation of payloads including toxins, radioisotopes, and oligonucleotides, has created therapeutic modalities some of which have progressed to the clinic.

#### 11:45 Anti-Von Willebrand Factor NANOBODY® Compound Cablivi Story from Conception to Commercialization

Benedikte Serruys, PhD, Global Head Biologics Innovation, Large Molecule Research Platform, Sanofi

Caplacizumab, a revolutionary anti-von Willebrand Factor NANOBODY compound, emerged from two decades of innovation at Sanofi. This presentation chronicles the complete development journey from llama immunization in 2003, through major regulatory approvals, starting with EMA (2018) and FDA (2019). The HERCULES pivotal trial demonstrated significant clinical benefits in aTTP patients. As the first approved NANOBODY therapeutic, caplacizumab has established a new treatment paradigm for this rare blood disorder.

#### 12:15 pm From Target to Therapeutic: Cryo-EM as a Catalyst for Antibody Development



Christopher Arthur, CSO, Structural Biology, FairJourney Biologics SA

#### 12:45 Session Break

#### 12:50 LUNCHEON PRESENTATION: 100+ Undruggable Targets Unlocked through Parallel MAb Engineering



Ross Chambers, Vice President, Antibody Discovery, Integral Molecular

We developed CDR-scanning, a high-throughput method that mutates each antibody CDR residue to all 19 other amino acids. Variant analysis generates a dataset that guides engineering to improve binding, developability, and other properties. Testing against orthologs enables engineering of cross-species reactivity, facilitating preclinical evaluation. CDR-scanning also strengthens antibody genus patent claims by supporting enablement and written description. The resulting datasets can train AI/ML models to improve antibody performance and design.

#### 1:20 LUNCHEON PRESENTATION: Leveraging High-Throughput Data for Next-Gen Biotherapeutic Discovery



Colby Souders, CSO, Biopharma, Twist Bioscience

AI/ML for biotherapeutics is constrained by the scale and quality of training data. In this session, Twist Bioscience will present multiple workflows for strategies to bridge this gap using high-fidelity synthetic DNA platforms and bespoke data outputs that integrates next-generation synthesis, production and characterization directly into the Design-Make-Test-Learn cycle. Case studies will illustrate how LLMs are validated using Twist "off-the-shelf" data sets, how high-throughput iterations of make-test cycles can be used to compare and train new models, and when *in silico* (*de novo*) designed libraries coupled with wet-lab panning and screening can simultaneously generate lead therapeutic candidates while also validating and training generative models. Learn how scalable and innovative antibody services transform ML into a powerful engine for rapid biotherapeutic discovery.

#### 1:50 Close of Display of Biologics Conference

#### 6:30 Recommended Dinner Short Course

#### SC7: Targeting the Target: Aligning Target and Biologic Format Biology to Achieve Desired Outcomes

\*Separate registration required. See short course page for details.



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

**SC1: In silico and Machine Learning Tools for Antibody Design and Developability Prediction**

\*Separate registration required. See short course page for details.

## TUESDAY, MAY 12

1:50 pm Networking Coffee &amp; Dessert Break in the Exhibit Hall with Poster Viewing

2:20 Organizer's Opening Remarks

**PROGRESS IN ADVANCING SMALL PROTEIN SCAFFOLDS**

2:25 Chairperson's Remarks

*Christopher M. Koth, PhD, Vice President, Biotherapeutics, Discovery Sciences, Denali Therapeutics Inc.*

2:30 Lessons Learned from Comprehensive Biophysical Profiling of Clinical Stage Single Domain Antibodies

*Gilad Kaplan, PhD, Director, Protein Analytics & Developability, Biologics Engineering, AstraZeneca*

Single-domain antibodies (sdAbs) are compact, stable, single-chain biologics increasingly used in diagnostics, radio-immunoconjugates, and multispecifics. As a newer therapeutic format, the developability rules for sdAb containing Biologics are still emerging. We share lessons from the comprehensive biophysical profiling of >30 clinical-stage sdAbs in the VHH-Fc and VHH formats, spanning developability and manufacturability metrics, alongside preliminary *in vivo* PK results.

3:00 Language Model Aided DARPIn Maturation toward Hostile Biological Environment

*Zhilei Chen, PhD, Professor, Medicinal Protein Lab, Texas A&M University*

Enteric diseases are common human ailments. However, conventional biologics are not suited for enteric applications due to their susceptibility to degradation in the protease-rich hostile environment of the GI tract. Using click display, which directly links the protein library to the coding cDNA, and a language model to access "naturalness," we report the engineering of protein-stable DARPins for potent neutralization of *C. difficile* toxin TcdB as oral therapeutic candidates.

3:30 Next-Generation Bispecific Antibody Manufacturing Based on an Innovative Modular Toolbox

*Stefan Schmidt, CEO, evitria AG*

4:00 Refreshment Break in the Exhibit Hall with Poster Viewing

4:10 Speed Networking

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

**SPEED NETWORKING**

Speed Networking: How Many New Contacts Can You Make?

*Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute*

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

**ENGINEERING DELIVERY TO THE BRAIN**

4:40 Next-Generation Antibody Shuttles for CNS Protein and Nucleic Acid Delivery

*Peter M. Tessier, PhD, Albert M. Mattocks Professor, Pharmaceutical Sciences & Chemical Engineering, University of Michigan*

The modest ability of antibodies to penetrate the blood-brain barrier severely limits their use in therapeutic applications. We are developing antibody shuttles that target CNS proteins to mediate enhanced and selective CNS targeting and, in some cases, long-lived CNS retention. Here we will discuss our recent progress in engineering next-generation transferrin receptor and CD98hc-targeted CNS shuttles, as well as their application for delivering proteins and nucleic acids for therapeutic applications.

5:10 Identification of Variable Lymphocyte Receptors That Target the Blood-Brain Barrier

*Eric V. Shusta, PhD, Howard Curler Distinguished Professor, Chemical & Biological Engineering, University of Wisconsin, Madison*

The blood-brain barrier presents a major obstacle to brain drug delivery. We have developed an enabling platform for the identification of blood-brain barrier targeting antibody-like molecules known as Variable Lymphocyte Receptors (VLRs). These VLRs could ultimately be used to ferry drug cargo into the brain. Here we will describe our recent efforts to identify and validate such

blood-brain barrier targeting VLRs.

5:40 Mechanisms Underlying Enhanced Brain Exposure by Dual-Targeting the Transferrin Receptor and CD98hc

*Christopher M. Koth, PhD, Vice President, Biotherapeutics, Discovery Sciences, Denali Therapeutics Inc.*

Targeting blood-brain barrier receptors enables brain delivery of biologics. We engineered an Fc-based dual transport vehicle (TV) that targets transferrin receptor (TfR) and CD98hc, combining rapid TfR-driven uptake with CD98hc-mediated retention. Dual TVs achieve higher brain concentrations than single-receptor formats. Adjusting TfR/CD98hc affinities tunes exposure kinetics and biodistribution. A mechanistic model links architectural designs to brain PK, guiding optimization of brain-penetrant biologics.

6:10 Close of Day

6:30 Recommended Dinner Short Course

**SC7: Targeting the Target: Aligning Target and Biologic Format Biology to Achieve Desired Outcomes**

\*Separate registration required. See short course page for details.

## WEDNESDAY, MAY 13

8:00 am Registration Open

**PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL**

8:25 Chairperson's Remarks

8:30 Innovation in Protein Science with Young-Scientist Visionaries

*Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco*

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.

**Panelists:**

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School

Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder

Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School

**9:15 Coffee Break in the Exhibit Hall with Poster Viewing****MENTORING MEET-UP****Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship**

Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

**PANEL DISCUSSION****10:05 PANEL DISCUSSION: Near-Term Challenges for ML/ AI in Biotherapeutic R&D**

Moderator: Peter M. Tessier, PhD, Albert M. Mattocks Professor, Pharmaceutical Sciences & Chemical Engineering, University of Michigan

This panel will examine the state of AI and machine learning in biologics R&D, focusing on the data foundations needed for trustworthy models, the technology's ability to tackle complex targets, and the limits of current predictive power. Our group will explore practical design strategies, evaluate zero-shot versus iterative workflows, and highlight where AI already delivers value—and where future advances such as accurate immunogenicity prediction may emerge.

**Panelists:**

Andrew Buchanan, PhD, FRSC, Head of Discovery, Stealth Mode Biotech

Norbert Furtmann, PhD, Head, Biologics AI & Design, Large Molecules Research, Sanofi

Konrad S. Krawczyk, PhD, Founder & CSO, NaturalAntibody SA

Andrew C.R. Martin, DPhil, Emeritus Professor of Bioinformatics and Computational Biology, University College London

Melody Shahsavarian, PhD, Director, Data Strategy & Digital Transformation, Biotherapeutics Discovery Research, Eli Lilly & Company

Bernhardt L. Trout, PhD, Professor, Chemical Engineering, Massachusetts Institute of Technology

**11:05 Accelerating Antibody Discovery: Integrating microfluidics, HT Expression, and Early Developability Platform**

Lei Shi, SVP, R&D, Biointron

Increasingly, antibody drug development requires quick and holistic assessment from the discovery stage with a powerful platform, which demands experienced scientists making smart and strategic choices. We will discuss how Biointron's unique single B cell sorting-based antibody screening can help identify a population of diverse and functional hits with shortend timeline. Intergrated with our high-through-put expression, validation and developability assay platforms, the path from hits to candidate can be more efficient with data beyond just binding and time less spent

**11:35 Session Break****11:40 LUNCHEON PRESENTATION: A Binder Is Not Enough: Combining Antibody Discovery and Engineering through Celestive**

John Kenney, President, Antibody Solutions

Over the last 10 years, antibody discovery has become increasingly complex: difficult targets, different antibody sources, and diverse therapeutic modalities are just some considerations. This, combined with short timelines and shifting priorities, makes completing a project ever more challenging. Celestive™ couples antibody discovery with engineering to address difficult targets and exploit different B-cell types and format options in a fast, efficient, flexible, and cost-effective manner.

**12:10 pm LUNCHEON PRESENTATION: The Specifica Gen3 Bispecific Platform: Functional, Developable Bispecific Constant Light-Chain Antibodies**

Adeline Fanni, Associate Principal Scientist, Lab Science, IQVIA Laboratories

**INTERACTIVE BREAKOUT DISCUSSIONS****12:40 Find Your Table and Meet Your Discussion Moderator****12:50 Interactive Roundtable Discussions**

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

**TABLE 1: Optimizing the CNS Delivery of Biotherapeutics**

Christopher M. Koth, PhD, Vice President, Biotherapeutics, Discovery Sciences, Denali Therapeutics Inc.

**TABLE 2: Strategies and Metrics for Discovering Drug-Like Internalizing Antibodies**

Jie Zhou, PhD, Assistant Professor, Radiation and Cellular Oncology, Chemistry, University of Chicago

**MACHINE-LEARNING USE CASES IN PROTEIN ENGINEERING****1:35 Chairperson's Remarks**

Gilad Kaplan, PhD, Director, Protein Analytics & Developability, Biologics Engineering, AstraZeneca

**1:40 PROPERMAB: An Integrative Framework for *in silico* Prediction of Antibody Developability Using Machine Learning**

Bian Li, PhD, Principal Scientist, Therapeutic Proteins, Regeneron

Accurately predicting developability characteristics is a pivotal yet challenging task in antibody therapeutic development. To overcome the limitations of small training datasets, we designed and implemented an integrative antibody feature engineering and machine learning framework called PROPERMAB. Using



this framework, we developed predictive models for antibody hydrophobic interaction chromatography retention time and high-concentration viscosity. We also demonstrate the potential to scale our approach to repertoire-scale sequence datasets.

### 2:10 Leveraging Experimental Affinity Data to Train AI for High-Affinity Antibody Design

*Yejin Kim, PhD, Associate Professor, Department of Health Data Science and Artificial Intelligence, University of Texas Health Science Center at Houston*

Experimental affinity data provide valuable guidance for AI-driven antibody design. We introduce an AI model that integrates structural context with experimentally measured affinities to guide sequence generation. Our model improves predicted binding affinity compared to a general protein language model in *in silico* validation, and ongoing experimental studies are revealing important insights into the interplay between affinity optimization and antibody developability.

approach to advanced antibody engineering. This presentation provides our realistic and evidence-based perspective on AI's impact on developing next-generation antibody therapeutics.

### 3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing

## CHALLENGING TARGETS AND PATHWAYS

### 4:20 Engineering Cytokine Agonists for Therapeutic Applications

*Shion Lim, PhD, Principal Scientist & Group Leader, Genentech*

Cytokines are vital for anti-tumor immunity but face several limitations as therapeutic molecules, including pleiotropic activity, poor stability and half-life, and dose-limiting toxicity. Different engineering approaches to modify the cytokine or turning to alternative formats such as antibody mimetics exist to address these limitations. In this talk, we describe engineering approaches undertaken to develop cytokine Fc fusion and mimetics for IL-27 agonism.

### 4:50 Harnessing Endocytosis with Viral Display to Select Highly-Developable Internalizer for Precision Therapy

*Jie Zhou, PhD, Assistant Professor, Radiation and Cellular Oncology, Chemistry, University of Chicago*

Internalizing antibodies underpin multiple targeted therapeutic modalities, including receptor-downregulating antagonists, antibody-drug conjugates (ADCs), extracellular targeted protein degraders (eTPDs), and targeted cargo delivery systems. Yet most antibody discovery platforms optimize binding rather than the ability to induce rapid, productive endocytosis, which is governed by epitope, binding geometry, and downstream trafficking. We present a lentiviral selection platform that couples receptor-mediated endocytosis to a genetic readout, enabling direct enrichment of internalizing, developable antibodies.

### 5:20 De novo Design of a Peptide Modulator to Reverse Sodium Channel Dysfunction Linked to Cardiac Arrhythmias and Epilepsy

*Manu Ben-Johny, PhD, Assistant Professor, Physiology and Cellular Biophysics, Columbia University*

Voltage-gated sodium channels initiate action potentials in neurons and muscle. Dysfunction of these channels leads to sustained sodium influx that underlies various human diseases, including cardiac arrhythmias and epilepsy. We used *de novo* protein design to engineer a peptide modulator that restores the proper function of these ion channels. These studies demonstrate the

therapeutic potential of rationally designed biologic agents for correcting ion-channel dysfunction across cardiac and neurological disease settings.

### 5:50 Presentation to be Announced Antibodies Expand the Scope of GPCR Pharmacology

*Meredith A. Skiba, PhD, Assistant Professor, Biological Chemistry, University of Michigan*

G protein-coupled receptors (GPCRs) are among the most successful therapeutic targets, but their pharmacological landscape is dominated by small molecules. Antibodies have the potential to target GPCRs with enhanced specificity and differing pharmacokinetic properties, but few antibodies modulate GPCR function. We developed several strategies to discover functionally active, GPCR-targeting, synthetic antibody fragments. These antibodies exhibit rich and readily evolvable pharmacology, attesting to their potential as next-generation GPCR therapeutics.

### 6:20 Networking Reception in the Exhibit Hall with Poster Viewing

### 7:20 Close of Engineering Antibodies Conference



### 2:40 KEYNOTE PRESENTATION: Unbiased Deep Screening of Antibody-Antigen Interactions

*Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder*

Massive, quantitative datasets on sequence-binding potency are necessary for training AI to learn antibody-antigen molecular recognition. My group has developed quantitative cDNA and yeast display platforms for evaluating antibody-antigen interactions at scale. In unpublished work, we use yeast-based MAGMA-seq (Petersen et al, NCOMMS 2024; Kirby et al PNAS 2025) to identify antigen sequences recognized by the germline-encoded human antibody repertoire. I'll also describe a new cDNA-based library on library assay.

### 3:10 End-to-End AI Applications for Advanced Antibody Engineering



*Patrick Doonan, Director, Alliance Management, Alliance Management, Ailux*

Ailux is an AI-native biologics innovation company advancing the next generation of biotherapeutics through the seamless integration of data, artificial intelligence, and experimental science. Ailux's platform synergistically combines the best of our comprehensive wet lab, AtlaX biologics database, and three proprietary AI engines. We will present our latest case studies that exemplify our AI-driven



## SUNDAY, MAY 10

## 2:00 pm Recommended Pre-Conference Short Course

SC1: *In silico* and Machine Learning Tools for Antibody Design and Developability Predictions

\*Separate registration required. See short course page for details.

## THURSDAY, MAY 14

## 7:30 am Registration Open

## 7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast

Moderator: Catharine Smith, Executive Director, Termeer Foundation

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

Panelists:

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Noor Jaikhani, PhD, CEO &amp; Co-Founder, Matrisome Bio

## 8:30 Transition to Sessions

## 8:40 Organizer's Remarks

USE OF AI IN COMPLEX MODALITIES:  
MULTISPECIFICS AND NOVEL SCAFFOLDS

## 8:45 Chairperson's Remarks

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi

## 8:50 Presentation to be Announced

## 9:20 Accurate Protein-Binder Design Using BindCraft

Lennart Nickel, Graduate Student, Biotechnology & Bioengineering, École Polytechnique Fédérale de Lausanne

Protein-protein interactions are fundamental to biology but remain difficult to design due to their structural complexity. We introduce BindCraft, an open-source platform for *de novo* protein-binder design that achieves high-affinity binding without experimental optimization or prior binding information. BindCraft enables the generation of functional binders for diverse targets including receptors, allergens, and nucleases, advancing a "one design one binder" paradigm with broad potential in therapeutics, diagnostics, and biotechnology.

## 9:50 Designing Biochemical Function with Generative AI

Rohith Krishna, PhD, Postdoctoral Fellow, Computational Biology & Machine Learning, University of Washington

Deep learning has accelerated protein design, but most existing methods are restricted to generating protein backbone coordinates and often neglect interactions with other biomolecules. I will present the next generation of protein design methods that include side-chain coordinates for design of more complex biomolecular function. Finally, I will show a series of applications of these algorithms to design of experimentally characterized functional proteins.

## 10:20 LensAI: A Multi-Parametric AI Platform for Integrated Antibody Discovery, De-Risking, and Engineering



Shuji Sato, VP of Innovative Solutions, Business Development, MindWalk

This approach enables antibody discovery from sequence only, with traceable outputs across discovery stages. LensAI™, powered by HYFT®, applies multi-parametric analysis by integrating AI models with large-scale lab and *in silico* data. It supports triaging hits from *in vivo*, *in vitro*, and repertoire sequencing, performs clone clustering, and evaluates epitope and paratope features with developability, manufacturability, and immunogenicity predictors for sequence-level mapping toward engineered preclinical leads.

## 10:35 Multimodal Fusion of Empirical Structural Data and Deep Learning for Improved Modeling of Antibody-Antigen Complexes



Dan Benjamin, CTO & CoFounder, R&D, Immuto Scientific

We present a multimodal AI framework that fuses radical footprinting data with deep learning to more accurately model antibody-antigen complexes, including disordered and hypervariable interfaces. Using Immuto's high-throughput radical footprinting platform, large-scale structural datasets, comprising hundreds of protein complexes, are generated to train AI systems, providing solution-state, dynamic data across all protein classes, including multipass transmembrane proteins. These experimental constraints enable advanced, actionable models for antibody engineering, affinity maturation, and specificity design.

## 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

## ENTREPRENEUR MEET-UP

## Fostering Entrepreneurship and Models for Start-Ups

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Catharine Smith, Executive Director, Termeer Foundation

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

## PLENARY FIRESIDE CHAT



## 11:35 Plenary Fireside Chat Introduction

Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.

## 11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience



Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation

The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

Panelists:

Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

Rebecca Croasdale-Wood, PhD, Senior Director, Augmented Biologics Discovery & Design, Biologics Engineering, Oncology, AstraZeneca

Joshua Meier, Co-Founder & CEO, Chai Discovery

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi



12:35 pm Networking Luncheon in the Exhibit Hall and Last Chance for Poster Viewing

## DEVELOPABILITY AT-SCALE

### 2:05 Chairperson's Remarks

*M. Frank Erasmus, PhD, Head, Bioinformatics, Specifica, an IQVIA business*

### 2:10 Predicting sdAb Biophysical and Developability Properties

*Andrei Kamenski, PhD, Senior Data Scientist, InSilico Biologics Discovery, Novo Nordisk R&D UK*

Single-domain antibodies (sdAbs), such as camelid VHH, are a strong focus area in biologics discovery due to their small size and modularity. However, the link between sdAb sequence, structure, and developability is poorly understood. To bridge this gap, we trained machine learning models on custom early-stage developability datasets, predicting key properties such as thermostability, hydrophobicity, and polyreactivity. In this talk, we will share our latest scientific and modelling insights.

### 2:40 Application of AI to Developability Screening, a Skeptic's View

*Andrew C.R. Martin, DPhil, Emeritus Professor of Bioinformatics and Computational Biology, University College London*

AI has been used in bioinformatics since the early 1990s, but recent advances, driven by approaches such as protein-language and generative models, have revolutionized many areas of life. There have been several publications that use such approaches for *ab initio* antibody design, but I for one remain skeptical. Nonetheless, there are clear applications for modern AI techniques around antibody developability, and improving candidate antibody-based drugs.

### 3:10 TherAbDesign: Bridging AI and Biophysics for Antibody Developability Optimization

*Amy Wang, PhD, Senior ML Scientist, Prescient Design, Genentech*

Antibodies are promising protein therapeutics, but successful development requires meeting strict developability criteria. We present TherAbDesign, a machine-learning method that evaluates and optimizes antibodies based on sequence alone, proposing modifications that mimic the biophysical properties of successful therapeutics. This approach circumvents computationally expensive structure prediction and physics-based calculations. We show that this method improves known developability liabilities, such as viscosity, without explicitly modeling their mechanism of action.

### 3:40 Scalable, Robust and Easy to Use Biologics Discovery & Development with Generative AI

*Eli Bixby, Co Founder & Head of ML, ML Research & Engineering, Cradle*

Generative AI is redefining what's possible in biologics discovery – enabling scientists to explore protein sequence space more efficiently, design higher-performing molecules, and accelerate the path from concept to candidate. At Cradle, we are developing intuitive software tools that allow protein engineers to directly leverage generative AI models within their existing workflows. This presentation will showcase how Cradle's technology enables scalable and reproducible protein design, combining advanced AI architectures with user-centered design to reduce cycle times and ultimately create better biologics.

### 4:10 Networking Refreshment Break

## INNOVATION SHOWCASE

### 4:40 Innovation Showcase Talk Title to be Announced

*Elise Pepermans, CEO and cofounder, immunopeptidomics, ImmuneSpec*

### 4:45 Innovation Showcase Presentation to be Announced

## DEVELOPABILITY AT-SCALE (CONT.)

### 5:10 Benchmarking Language Models for Antibody and Nanobody Tasks

*Koji Tsuda, PhD, Professor, Computational Biology & Medical Sciences, University of Tokyo*

Recent advances in protein language models (PLMs) have demonstrated strong performance on structure and function prediction. To evaluate their performance in nanobody-related tasks, we developed a comprehensive benchmark suite, NbBench. Benchmarking of eleven models revealed that antibody language models excel in antigen-related tasks, while thermostability and affinity-related tasks remain challenging across all models. We further discuss how PLMs and their benchmarks could impact on antibody research.



### 5:40 PANEL DISCUSSION: Are *In Silico* Tools Truly Reducing Clinical Failure and Accelerating Development?

*Moderator: M. Frank Erasmus, PhD, Head, Bioinformatics, Specifica, an IQVIA business*

- Validity of Proxies
- Manufacturing vs. Efficacy
- Generative Bias:
- The Negative Data Gap
- False Positives
- The MHC Limitation
- Predicting Tolerance

*Panelists:*

*Hunter Elliott, PhD, Senior Director, Machine Learning, BigHat Biosciences*

*Sandeep Kumar, PhD, Senior Vice President, Digital Biologics, Natural Antibody*

*Andrei Kamenski, PhD, Senior Data Scientist, InSilico Biologics Discovery, Novo Nordisk R&D UK*

### 6:10 Close of Day

## FRIDAY, MAY 15

### 7:15 am Registration Open

## INTERACTIVE ROUNDTABLE DISCUSSIONS

### 7:30 Interactive Roundtable Discussions with Continental Breakfast

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.



### TABLE 1: The Alntibody Challenge: Inaugural Results and What's New in Challenge 2

Andrew R.M. Bradbury, MD, PhD, CSO, Specifica, an IQVIA business  
M. Frank Erasmus, PhD, Head, Bioinformatics, Specifica, an IQVIA business

- Review final results from the initial Alntibody Challenge, which included >30 teams across pharma, biotech, academia and AI companies. The final manuscript will be submitted in February and published later in Nature Biotech
- Evaluate target affinity, developability (minimum score), and submission time
- Discuss plans for the second challenge

### TABLE 2: From Binding to Application: What Will It Take for De Novo Binders to Succeed?

Lennart Nickel, Graduate Student, Biotechnology & Bioengineering, École Polytechnique Fédérale de Lausanne

- Are *de novo*-designed miniproteins moving beyond academic proof-of-concept toward robust, reproducible therapeutic platforms?
- What technical, biological, and manufacturing hurdles must still be addressed for *de novo* formats to truly rival antibody-derived scaffolds?
- In which applications do antibodies and miniproteins naturally coexist, and where do miniproteins provide superior performance or design freedom?
- What do we know and how much can we predict the immunogenicity of *de novo* protein binders?

## LAB-IN-THE-LOOP

### 8:25 Chairperson's Remarks

Victor Greiff, PhD, Associate Professor, University of Oslo; Director, Computational Immunology, IMPRINT

### 8:30 Better Antibodies Engineered with a GLIMPSE of Human Data

Lance Hepler, PhD, Co-Founder, R&D, Infinimmune Inc.

Infinimmune presents GLIMPSE, an antibody language model trained on proprietary human data that achieves state-of-the-art performance. We used GLIMPSE within our lab-in-a-loop platform to engineer an anti-IL-13 antibody, enhancing its drug-like properties including potency, extended half-life, affinity, stability, and manufacturability via liability removal. This work demonstrates the practical application of language models for optimizing therapeutics while maintaining their humanness, moving beyond typical proof-of-concept studies.

### 9:00 Training Data Composition Determines Machine-Learning Generalization and Biological Rule Discovery

Victor Greiff, PhD, Associate Professor, University of Oslo; Director, Computational Immunology, IMPRINT

We evaluated how different negative-class definitions affect generalization and rule discovery in antibody-antigen binding using synthetic structure-based data. Models trained with negatives more similar to positives had reduced in-distribution performance but markedly better out-of-distribution generalization. Ground-truth analyses revealed that inferred binding rules shift with negative set choice, and experimental validation confirmed these findings, emphasizing dataset design for robust, biologically meaningful models.

### 9:30 Computational Design of Antibody Repertoires

Ariel Tennenhouse, Graduate Student, Biomolecular Sciences, Weizmann Institute of Science

We are developing a new strategy for designing repertoires of billions of structurally diverse and stable human antibodies. I will first describe two methods we developed for atomistic antibody design that enable this strategy and show that each method can optimize antibodies across a variety of criteria without prior mutational data. This shows that optimizing native-state energy is an excellent first approach for antibody optimization.

### 10:00 Unify and Accelerate AI-Powered Lab-in-the-Loop Drug Discovery with Amazon Bio Discovery

Jiwon Kim, Amazon Web Services

Drug discovery takes 10 years and \$2.6B per approved therapeutic. Amazon Bio Discovery unifies the full Lab-in-the-Loop workflow — AI model access, experiment design, *in silico* candidate optimization, wet-lab ordering, and closed-loop learning all in one platform. Accelerate your antibody discovery pipeline with a free 30-day trial.

### 10:30 Networking Coffee Break

## DE NOVO BIOLOGICS DESIGN: USING AI TO CREATE BRAND-NEW ANTIBODIES AND PROTEINS FROM SCRATCH

### 10:44 Chairperson's Remarks

Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

### 10:45 From Proof-of-Concept to Proof-of-Productivity and Scale

Hans M. Bitter, PhD, Head Computational Science, Data Strategy, Takeda Pharmaceutical Co. Ltd.

Proof-of-concept has been demonstrated, showing how AI methods can be used to design and optimize large molecules. We must shift our focus to scaling to maximize the productivity and innovation gains. This talk will cover a selection of PoCs and then how we are scaling digital biologics at Takeda across our portfolio.

### 10:55 Massively Multiplexed *in vivo* Screening of AI-Designed Proteins Enables Programmable Tissue Targeting

Pierce J. Ogden, PhD, Co-Founder & CSO, Manifold Biotechnologies Inc.

At Manifold Bio, we've built a direct-to-*vivo* platform that connects AI-driven protein design to functional data from living systems. Using this approach, we generate and evaluate thousands of designed binders to novel targets simultaneously *in vivo*. This massively multiplexed framework has yielded functional brain shuttles capable of crossing the blood-brain barrier, and we are now extending it to other tissues to enable selective delivery of diverse therapeutics.

### 11:05 Push-Button Biologics Design

Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

We recently announced JAM-2, which can design antibodies with drug quality properties with high success rates. We'll discuss these results, and also share examples of what successful deployment on real drug discovery programs partnered with large pharma looks like. We'll discuss roadblocks and share practical lessons/advice for how to build teams and infrastructure to ensure AI driven biologics discovery delivers real drugs not just headlines.

### 11:15 PANEL DISCUSSION: *De novo* Biologics Design: Using AI to Create Brand-New Antibodies and Proteins from Scratch

Moderator: Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

Panelists:

Hans M. Bitter, PhD, Head Computational Science, Data Strategy, Takeda Pharmaceutical Co. Ltd.

Pierce J. Ogden, PhD, Co-Founder & CSO, Manifold Biotechnologies Inc.

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi

### 12:15 pm Close of Summit



# ONCOLOGY STREAM



ONCOLOGY STREAM  
CONFERENCES

## Emerging Modalities and Targets Driving Precision Oncology

The Oncology Stream at the PEGS Boston Summit 2026 will present cutting-edge advances in antibody-based therapeutics and targeted cancer modalities, bringing together leaders from academia, biotech, and pharma to drive the next wave of innovation. Across three focused conferences—Antibodies for Cancer Therapy, Emerging Targets for Oncology and Beyond, and Driving Clinical Success in Antibody-Drug Conjugates—attendees will explore the latest breakthroughs in T cell engagers, bispecifics, conditional antibodies and novel scaffolds; uncover novel tumor-associated, intracellular and “undruggable” targets with the help of AI-enabled discovery platforms; and take a deep dive into the evolving ADC landscape, including dual payloads, next-generation linkers, and conjugates that integrate degraders, cytokines, and oligonucleotides. With case studies of recent clinical successes, insights into translational challenges, and showcases of innovative formats and designs, this stream offers a comprehensive view of how oncology biologics are reshaping treatment paradigms and accelerating precision medicine.

MAY 11-12

## Antibodies for Cancer Therapy

AGENDA

MAY 12-13

## Emerging Targets for Oncology & Beyond

AGENDA

MAY 14-15

## Driving Clinical Success in Antibody-Drug Conjugates

AGENDA



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

## SC5: Safety &amp; Efficacy of Bispecifics and ADCs

\*Separate registration required. See short course page for details.

## MONDAY, MAY 11

7:00 am Registration and Morning Coffee

8:20 Organizer's Opening Remarks

COMPARING AND COMBINING TCEs, ADCs,  
CAR Ts AND RADIOIMMUNOTHERAPY

8:25 Chairperson's Remarks

Daniel A. Vallera, PhD, Lion Scholar; Director, Section on Molecular Cancer Therapeutics; Professor, Therapeutic Radiology, University of Minnesota Masonic Cancer Center



## 8:30 KEYNOTE PRESENTATION: Comparing TCEs and CAR T Cell Therapies: What Have We Learned So Far?

Patrick Baeuerle, PhD, Chief Scientific Advisor, Cullinan Therapeutics, Inc.

T cell-engaging antibodies (TCEs) are bispecific, antibody-based adaptor proteins that connect any kind of cytotoxic T cells with select target cells for redirected lysis. Over the last three years, TCEs have seen an unparalleled surge in approvals as a standalone therapy. A total of twelve TCEs are now approved that very effectively treat hematological as well as solid-tumor indications. I will in-depth compare TCEs with CAR-T cell therapies.

## 9:00 Optimal Method of Targeting TRBC Alleles in T Cell Malignancies: Comparing CAR Ts and ADCs

Suman Paul, MBBS, PhD, Associate Professor, Oncology, Johns Hopkins University

T cell cancers are often fatal. Targeting TRBC1 can kill T cell cancers while preserving sufficient healthy T cells to maintain immunity. However, the first-in-human clinical trial of anti-TRBC1 CAR T cells reported a low response rate and unexplained loss of anti-TRBC1 CAR T cells. We further show that the generation of TRBC1-targeting ADCs bypasses this limitation and may produce superior responses in patients with T cell cancers.

## 9:30 Radioimmunotherapy: Engineered Antibody Formats, Fusion Proteins, and Combination Therapy

Anna M. Wu, PhD, Chair and Professor, Immunology & Theranostics, Center for Theranostic Studies, City of Hope

The development of antibodies for radiopharmaceutical therapy continues apace, with recent progress in engineered antibody formats and fusion proteins adding versatility to treatment approaches. Combination therapies are likely to provide the greatest efficacy, and prospects for combining radioimmunotherapy with modalities including external beam therapy and immunotherapies will be described. Clinical examples include targeting CD25 and CD38 in hematologic malignancies and CEA in colorectal and other adenocarcinomas.

## 10:00 From AI Designs to Oncology Leads in Days: Screening and Scaling Antibodies and RTKs with ALiCE®



Jonathan Fauerbach, Head of R&D, R&D, LenioBio GmbH

As AI expands the oncology drug design space, LenioBio's cell-free ALiCE® platform helps preclinical teams keep pace. ALiCE® delivers correctly folded antibodies and complex membrane proteins with eukaryotic modifications in a matter of hours—no cell-line development needed. ALiCE® HTPE closes the screening expression gap in lab in the loop workflows for AI designed molecules, integrating DNA generation, expression, purification, and analytics into high throughput, automation ready processes that compress antibody discovery cycles from weeks to days. Case studies highlight AI-generated antibody screening and challenging RTK targets like FGFR3-TACC3 and glioblastoma VHHs.

## 10:30 Networking Coffee Break

## NEXT-GENERATION DRUG CONJUGATES

## 11:00 Overcoming the Tumor Penetration Challenge: Nanofitin-Based Drug Conjugates for Deep and Efficient Tumor Engagement

Mathieu Cinier, PhD, CSO, Afflogic

Treating cancer requires balancing cytotoxicity, immune activation, and safety to eradicate malignant cells while sparing healthy tissue. Nanofitin-based drug conjugates combine antibody-like specificity with the superior tumor penetration of small scaffolds. Their rapid clearance minimizes off-target toxicity while ensuring efficient payload delivery. In preclinical models, weekly MMAE-Nanofitin dosing achieved complete tumor inhibition, overcoming diffusion and resistance barriers to reach poorly vascularized regions and enabling next-generation targeted cancer therapeutics.

## 11:30 Coupling Tumor-Specific Payload Delivery with a Novel Target for Immune Engagement

John Burg, PhD, Senior Director, Protein Sciences, Pheast Therapeutics

Achieving specificity and efficacy remain key challenges in immuno-oncology. We have developed a bispecific antibody-drug conjugate (ADC), integrating a tumor targeting arm with a functional arm that enhances immune engagement by a novel mechanism. This strategy enables selective payload delivery while amplifying the immune response in the tumor microenvironment. Preclinical studies demonstrate potent *in vitro* and *in vivo* activity.

## 12:00 pm Session Break

## 12:10 LUNCHEON PRESENTATION: Antibody Discovery for Complex Membrane Antigens



Ernest Smith, General Manager, Vaccinex, Inc

Our Activmab technology enables the direct incorporation of multi-pass membrane proteins such as GPCRs and ion channels into the membrane of two antigenically distinct poxviruses. The protein of interest is correctly folded and expressed in the cell-derived viral membrane and does not require any purification before downstream use. Antigen expressing virus can be used for antibody selection using any *in vitro* display platform. Antigen virions can also be used for *in vivo* antibody discovery. Immunization with either viral strain produces potent antibody responses. The resulting immune cells can then be used for Single B Cell sorting, or to create an immunized phage library for *in vitro* panning.

## 12:40 LUNCHEON PRESENTATION: The Retrogenix Cell Microarray, a Foundation for Safer and Targeted Biologic Development



Mark Aspinall-O'Dea, Associate Director, Advanced Modalities, Charles River

Late-stage clinical attrition often results from unforeseen off-target toxicity. The Retrogenix platform shifts risk identification upstream, enabling better early-stage decisions and confident progression of safer, FDA-accepted therapeutics. This unique and versatile cell-based microarray technology assesses interactions with over 6,500 native, full length plasma membrane and secreted proteins. Discover how integration with TCR further strengthens drug safety profiling.

## 1:10 Session Break

## DUAL-TARGETING STRATEGY

### 1:15 Chairperson's Remarks

Mathieu Cinier, PhD, CSO, Afflogic

### 1:20 Next-Generation 4-1BB T Cell Engaging Bispecific Antibody (Grabody T) Demonstrated Clinical Activity and Safety Profile

Sang Hoon Lee, PhD, CEO & Founder, ABL Bio Inc.

Ragistomig (ABL503/TJ-L14B) is a bispecific combining PD-L1 checkpoint pathway with 4-1BB agonistic activity to overcome the current limitation of PD-(L)1 therapy and 4-1BB related toxicity. ABL503 is full length anti-PD-L1 mAb (Fc-silenced human IgG1) fused with scFv of anti-4-1BB engaging mAb. Givastomig (ABL111/TJ033721) is a bispecific designed to target tumors with CLDN18.2 expression and engage 4-1BB through a unique conditional activation mechanism at the tumor sites to avoid systemic toxicities.

### 1:50 Dual-Ig: A Novel Next-Generation T Cell Engager Targeting Both CD3 and CD137

Hiroaki Nagano, PhD, Pharmacology Researcher, Discovery Pharmacology, Research Division, Chugai Pharmaceutical, Co. Ltd.

TA/CD3 bispecific antibody is a potent approach in cancer treatment, but its efficacy is limited to tumors with less T cell infiltration. Dual-Ig binds to both CD3 and CD137 in the same Fab non-simultaneously, providing Signal 1 and Signal 2 to overcome this limitation while preventing off-target killing of TA-negative cells. We present the mechanism underlying this non-simultaneously binding and demonstrate advantages over conventional bispecific antibodies.

### 2:20 Simultaneous Targeting of Critical Immune Checkpoints and Activator by a Novel Multifunctional Fusion Protein for Cancer Therapy

Xiaodong Xiao, PhD, CEO, Jecho Laboratories, Inc.

We report a novel fusion protein, V5, for cancer immunotherapy. V5 contains an enhanced PD-1 ectodomain and a CD80 domain. The synergy of PD-1 blockade and T cell activation through CD80 led to inhibition of tumors in various animal models and induced immune memory. V5 also activates tumor-specific T cells via APCs and PD-L2 signaling. Preclinical studies in cynomolgus monkeys show a promising safety profile, supporting V5s in human studies.

### 2:50 Atlas Antibody Discovery: Unlocking Rapid Development of Human Therapeutics

Kit Fuhrman, Associate Director, Business Portfolio Management, JAX Mice and Clinical & Research Services, The Jackson Laboratory  
Dan Rohrer, CTO, AbTherx

Atlas™ Antibody Discovery Mouse Platform enables rapid, in-house discovery of high-affinity, developable antibodies with broad human sequence diversity. The platform supports the development of monoclonal and bispecific antibodies. The Atlas Binary Fixed Light Chain model enables efficient hit discovery while maintaining strong developability by broadening pairing possibilities with a wide range of heavy chains. Built by the experts at AbTherx, Atlas is now accessible to diverse immune-oncology programs through the Jackson Laboratory.

The Atlas Binary Fixed Light Chain model broadens pairing possibilities by accommodating a wide range of heavy chains, facilitating efficient hit discovery and maintaining strong developability.

### 3:20 Networking Coffee & Refreshment Break

### 4:05 Transition to Plenary Keynote Session

## PLENARY KEYNOTE



### 4:15 Plenary Keynote Introduction

G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company



### 4:25 CARs 2026: New Models and New Runways

Michel Sadelain, MD, PhD, Director, Columbia University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center

T cell engineering holds great promise for the treatment of cancers and other pathologies. The original chimeric antigen receptor (CAR) prototypes targeting CD19 are now giving way to further refined receptors endowed with greater sensitivity and combinatorial possibilities. Emerging new targets and engineering tools augur favorably for broadening the use of CAR therapies.

## YOUNG SCIENTIST KEYNOTE



### 5:10 Deep Learning-Based Binder Design to Probe Biology

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Protein-protein interactions are central to biology and drug discovery, yet traditional antibody generation is slow and costly. BindCraft is an open-source, automated computational pipeline for *de novo* protein binder design that routinely yields nanomolar binders with 10-100% experimental success, without high-throughput screening or maturation. We illustrate applications to peptides, cell-surface receptors, allergens, and gene editors, and outline how deep-learning workflows can accelerate next-generation therapeutics, diagnostics, and bioprocessing.

### 5:55 Welcome Reception in the Exhibit Hall with Poster Viewing

## YOUNG SCIENTIST MEET-UP

### Young Scientist Meet-Up

Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University

Gian Marco Visani, PhD Graduate Student, University of Washington

Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology

This young scientist meet-up is an opportunity to get to know and network with mentors of the PEGS community. This session aims to inspire the next generation of young scientists by giving direct access to established leaders in the field.

- Get to know fellow peers and colleagues
- Make connections and network with other institutions
- Discuss the role of mentors and peers role models in the field

### 7:15 Close of Day

**TUESDAY, MAY 12**

7:45 am Registration and Morning Coffee

**IMPROVING T CELL ENGAGER ANTIGEN SELECTIVITY AND ANTI-TUMOR ACTIVITY****8:30 Chairperson's Remarks***David Cole, Head of Research, Accession Therapeutics Inc.; Honorary Professor, Cardiff University***8:35 CBX250, a Novel Cathepsin G Peptide-HLA-Targeting T Cell Engager that Exhibits High Tumor Antigen Selectivity and Potent Antileukemic Activity *in Vivo****Scott Chunhua Shi, PhD, Associate Director Institute & Head of Biological Discovery, ORBIT Therapeutic Discovery, MD Anderson Cancer Center*

TCRm represent a promising modality for tumor-therapeutics. We have developed a robust TCRm discovery pipeline that enabled identification of the CTSG peptide-HLA-A\*02 complex from AML blasts, leading to the clinical candidate CBX250 (in collaboration with Crossbow Therapeutics). CBX250 demonstrates potent *in vitro* and *in vivo* efficacy without detectable cross-reactivity, and US Phase I trials are ongoing. A first-in-class TCRm×CD3 targeting CCNB1 is also in IND-enabling studies to benefit more patients.

**9:05 Addressing Solid-Tumor Heterogeneity: TROCEPT-Mediated Activation of a Universal Bispecific T Cell Engager via IV Delivery***David Cole, Head of Research, Accession Therapeutics Inc.; Honorary Professor, Cardiff University*

Tumors are very heterogenous and include immunosuppressive cell types, limiting the ability of current therapies to target all cells in the tumor with high potency. TROCEPT is a novel immuno-virotherapy that only targets cancer cells, and turns them into drug factories. We have used this technology to deliver a novel universal bispecific T cell engager, that can target all cancer cells, only inside the tumor.

**9:35 Combining CD3 and CD28 T Cell Engagers for Enhanced Anti-Tumor Activity***Gregory L. Moore, PhD, Executive Director, Protein Engineering, Xencor, Inc.*

CD3 T cell engagers activate T cells through Signal 1, but solid tumors generally lack the costimulatory signals required for full activation, potentially leading to anergy and reduced efficacy. Tumor-targeted CD28 bispecific antibodies that strictly depend on concurrent Signal 1 for costimulatory activity represent a key advancement in immunotherapy. Adding targeted costimulation

enhances cytokine production, proliferation, survival, restores activity in restimulation settings, and drives stronger anti-tumor responses in preclinical models.

**10:05 From High-Throughput Screening to Kinetics Directly on Cells: Streamlining Antibody Discovery with Biophysical Insights***Rafael Levin, Applications Scientist, Bruker*  
*Sven Malik, SPR Sales & Customer Service, Bus Dev, Bruker*

As antibody formats grow more complex, precise biophysical characterization becomes essential. We present a workflow combining high-throughput SPR for epitope binning and interaction screening, switchSENSE® for affinity vs. avidity and ternary complex detection, and single-cell Interaction Cytometry for real-time kinetics on living cells in native context. Together, these tools support informed antibody design and selection.

**10:35 Coffee Break in the Exhibit Hall with Poster Viewing****NOVEL FORMATS AND ALTERNATIVE APPROACHES****11:15 Cytotoxic PD-L1/PD-L2 Dual-Specific Antibodies Couple Tumor Stroma Remodeling with Checkpoint Blockade to Drive Rejection of "Cold" Cancers***Michael A. Curran, PhD, Founder and SAB Chairman, ImmunoGenesis; Associate Professor, Immunology, MD Anderson Cancer Center*

PD-1 and PD-L1 blocking antibodies have revolutionized immunotherapy of immune-infiltrated cancers through their capacity to revive, amplify and sustain T cell responses. Unfortunately, thousands of subsequent trials have shown that these drugs cannot overcome the multifactorial stromal barriers that mediate T cell exclusion and anergy in "cold" cancers. We show that PD-L1/PD-L2 dual-specific antibodies can combine complete PD-1 blockade with cytotoxic depletion of immune suppressive stroma to overcome cold cancers.

**11:45 Beyond IgG: The Therapeutic Potential of IgE and IgA Antibodies and Their Derivatives***Kevin FitzGerald, PhD, CSO, Epsilogen Ltd.*

Epsilogen develops therapeutic IgE and therapeutic IgA antibodies. Our lead antibody, MOv18 IgE, targets folate receptor alpha and has completed a phase 1 clinical trial. It is currently in a phase Ib trial treating PROC patients. Epsilogen also has IgE and IgA antibodies undergoing pre-clinical studies and it has a number of proprietary platforms including bispecific IgE and hybrid antibodies that combine IgE or IgA with IgG functionality.

**12:15 pm Conversion of Polyclonal Anti-Idiotypes into Characterized Recombinant Antibodies***Dr. Thierry Le Bihan, PhD, Principal Scientist, Polyclonal Antibody Sequencing*

Anti-idiotype antibodies are critical tools for therapeutic drug monitoring of biologics. Using adalimumab as proof-of-concept, we developed a proteomics-driven MS platform combining BCR sequencing and gel-based fractionation for anti-idiotype discovery. Recombinant candidates were classified as blocking, non-blocking, or partially blocking via ELISA and TNF-α competition, then further characterized by SPR and HDX-MS.

**12:45 Session Break****12:50 LUNCHEON PRESENTATION: Advancing Oncology Drug Discovery through Samsung Organoids and Integrated CDO Capabilities***Seahee Kim, Director, Organoid Technology Group, Samsung Biologics*

Samsung Organoids, our patient-derived organoid (PDO)-based screening service, provides physiologically relevant models that capture the complexity and heterogeneity of individual tumors. In this session, we highlight how organoid-based approaches enable predictive evaluation of anticancer drug candidates, supported by correlations with patient tumor characteristics and clinical response. Using Samsung Organoids-based screening, drug efficacy can be assessed across diverse tumor profiles, enabling more informed candidate prioritization while supporting early risk mitigation in development. We will also present functional data demonstrating the service's ability to capture biologically relevant responses. Moreover, the integration of DEVELOPICK, our developability assessment platform, enables simultaneous evaluation of drug efficacy and key developability attributes, supporting more efficient candidate selection and de-risking of development. Importantly, this service is seamlessly connected to our CDO capabilities, enabling a streamlined transition from early candidate evaluation to process development and manufacturing. This integrated Samsung Organoids-CDO approach supports more efficient decision-making and accelerates oncology drug development.

**1:50 Close of Antibodies for Cancer Therapy Conference****6:30 Recommended Dinner Short Course****SC6: Developability of Bispecific Antibodies**

\*Separate registration required. See short course page for details.

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SAMSUNG  
BIOLOGICS

**SUNDAY, MAY 10****2:00 pm Recommended Pre-Conference Short Course****SC3: Challenges and Opportunities in Solid Tumor and Autoimmune Disease Therapeutics**

\*Separate registration required. See short course page for details.

**TUESDAY, MAY 12****1:50 pm Networking Coffee & Dessert Break in the Exhibit Hall with Poster Viewing****2:20 Organizer's Opening Remarks****NOVEL TARGETS LANDSCAPE****2:25 Chairperson's Remarks**

*Daniel A. Vallera, PhD, Lion Scholar; Director, Section on Molecular Cancer Therapeutics; Professor, Therapeutic Radiology, University of Minnesota Masonic Cancer Center*

**2:30 IGSF8, an Emerging Target for Cancer Immunotherapy**

*Xiaole Shirley Liu, PhD, CEO, GV20 Therapeutics*

Despite the exciting clinical benefits of immune checkpoint inhibitors, only a minority of cancer patients respond. We integrate AI, functional genomics, and cancer immunology for drug discovery. Our STEAD platform computationally extracts antibodies from patient tumor RNA-seq profiles and pairs targets with antibodies *in silico*. Our lead program, GV20-0251, targets novel checkpoint IGSF8 and reached IND in three years, demonstrating favorable safety and promising monotherapy efficacy in metastatic cancer patients.

**3:00 GPC2 as a Target for Antibody- and Cell-Based Therapies in Childhood Cancers**

*Mitchell Ho, PhD, Senior Investigator & Deputy Chief, Laboratory of Molecular Biology; Director, Antibody Engineering Program, National Cancer Institute (NCI), National Institutes of Health (NIH)*

Glypican-2 (GPC2), an oncofetal antigen expressed in childhood cancers such as neuroblastoma, is a new target whose inhibition blocks Wnt/ $\beta$ -catenin signaling and N-Myc activity. I will also describe the engineering of T cells expressing novel antibody-TCR hybrids that incorporate a humanized CT3 Fab specific for GPC2, linked to TCR  $\alpha$  and  $\beta$  chains. These cells outperform CAR T cells in low-antigen tumors and have broad potential for solid tumor therapy.

**3:30 High-Throughput Immunotherapy Drug Discovery based on RNA Splicing to Identify Next-Generation Cancer-****specific Targets**

*Gayatri Arun, PhD, Exec VP Biology, Biology, Envisagenics Inc*

The audience will gain insights into how Envisagenics' SpliceCore platform leverages AI to discover and validate novel, tumor-specific targets through alternative splicing, offering a new approach to immunotherapy development. This presentation will walk the audience through the end-to-end process from target discovery to rigorous target validation showcasing SpliceCore's ability to identify actionable therapeutic targets with high specificity and safety.

**4:00 Refreshment Break in the Exhibit Hall with Poster Viewing****4:10 Speed Networking**

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

**SPEED NETWORKING****Speed Networking: How Many New Contacts Can You Make?**

*Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute*

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

**4:40 Next-Generation T Cell Receptor Bispecific (TCER) Targeting COL6A3 on the Stroma of Solid Tumors**

*Felix Unverdorben, PhD, Associate Director, TCR Discovery and Bispecifics, Immatix Biotechnologies GmbH*

Complementing Immatix' broad PRAME franchise, the presented T cell receptor bispecific (TCER) is directed against the stromal pHLA target COL6A3 Exon 6, aiming to disrupt the cancer's protective barrier providing an innovative approach for cancer treatment. TCR potency and specificity are assessed throughout TCR identification and TCER engineering, demonstrating strong thermal stability, high affinity target binding and killing of target positive tumor cell lines.

**5:10 Breaking the Sweet Silence: TACA Targeting Therapeutics against Tumor-Glycan Shields**

*Peter Sondermann, PhD, CSO, Tacalix GmbH*

Tumor-associated carbohydrate antigens (TACAs) are defined oligosaccharide structures, derived from changes in glycosylation pathways, that are expressed on the surface of cancer cells. Tacalix

develops antibodies against these difficult-to-target structures with the goal of spearheading the next generation of targeted anti-cancer therapeutics and will present its advancements in their current lead programs.

**5:40 Clean Cancer Targets for Better Therapeutics: Going beyond the Proteome**

*Hans H. Wandall, Co-Founder & CSO, Discovery, GO Therapeutics*

Most targeted cancer therapies rely on proteins overexpressed on tumors, but these are rarely truly cancer-specific, limiting safety and efficacy. GO Therapeutics leverages cancer-selective aberrant O-glycosylation to overcome this limitation. Using high-resolution O-glycoproteomics, we have defined tumor-restricted Tn-glycoepitopes on a large set of targets, including MUC1, MUC4, cMET, LAMP1, and CD44. Antibodies and ADCs directed to these glycoforms show high selectivity, potent *in vivo* cytotoxicity, and favorable cynomolgus toxicology.

**6:10 Close of Day****6:30 Recommended Dinner Short Course****SC7: Targeting the Target: Aligning Target and Biologic Format Biology to Achieve Desired Outcomes**

\*Separate registration required. See short course page for details.

**WEDNESDAY, MAY 13****8:00 am Registration Open****PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL****8:25 Chairperson's Remarks****8:30 Innovation in Protein Science with Young-Scientist Visionaries**

*Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco*

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science



and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.

**Panelists:**

*Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich*

*Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University*

*Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School*

*Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder*

*Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School*

**9:15 Coffee Break in the Exhibit Hall with Poster Viewing**

**MENTORING MEET-UP**

**Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship**

*Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies*

*Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University*

**NOVEL APPROACHES FOR PROTEIN DEGRADATION**

**10:00 Chairperson's Remarks**

*Mitchell Ho, PhD, Senior Investigator & Deputy Chief, Laboratory of Molecular Biology; Director, Antibody Engineering Program, National Cancer Institute (NCI), National Institutes of Health (NIH)*



**10:05 KEYNOTE PRESENTATION: Novel Approaches for Extracellular Targeted Protein Degradation (eTPD)**

*James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco*

The cell surface proteome, the surfaceome, is a major hub for cellular communication and a primary source of drug targets, both small molecules and biologics. Inspired by the field intracellular targeted protein degradation (iTPD) that brought us PROTACs and molecular glues, there has been a surge of interest in extracellular targeted protein degradation (eTPD). Here, I'll describe novel modalities for eTPD for soluble and membrane bound targets.

**10:35 Mechanisms and Therapeutic Applications of Antibody-Based Degraders**

*Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School*

Cell-surface proteins are key regulators of cellular activity, and one promising way to modulate their function is by controlling endocytosis. Under physiological conditions, cells use endocytosis to maintain homeostasis and tune signaling, yet its therapeutic potential is only beginning to be explored. I will discuss how bispecific antibodies can be designed to modularly control membrane protein endocytosis and signalling, their underlying mechanisms, and the potential therapeutic applications of these molecules.

**11:05 Presentation to be Announced**

**11:35 Session Break**

**11:40 LUNCHEON PRESENTATION: The Application of Nanodisc Technology Platforms to Develop Therapeutic mAbs for Multi-Pass Transmembrane Protein Targets**

*Donghui Ma, CEO & Founder, DIMA Biotechnology LLC*

Many important druggable targets are multi-pass transmembrane proteins. The key challenge is the extreme difficulty in obtaining purified functional proteins. To develop therapeutic lead mAbs on these targets, DIMA has optimized every step of antibody discovery process. In this poster presentation, we will exhibit how we integrate DIMA's Nanodisc technologies, including Syndisc™, PeptiNanodisc™, Single B enrichment and DiLibrary™ Mammalian display technology platforms to develop mAbs against a challenge multi-pass transmembrane target, CLDN18.2.

**12:10 pm Luncheon Presentation** (*Sponsorship Opportunity Available*) or **Enjoy Lunch on Your Own**

**12:40 Find Your Table and Meet Your Discussion Moderator**

**12:50 Interactive Roundtable Discussions**

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions

**TABLE 3: Designing for the Inside and Out: How Scaffold Choice Shapes Target Engagement and Drug Performance**

*Bradley M. Lunde, PhD, Associate Director, Adimab LLC*

The growing diversity of antibody scaffolds—DARPs, nanobodies, affibodies, miniproteins, and engineered fragments—is reshaping how we reach challenging intra- and extracellular targets. This Roundtable will explore

- How scaffold architecture influences target engagement, pharmacokinetics, tissue penetration, and intracellular access
- Design trade-offs between stability, size, and function
- How next-generation scaffolds are unlocking previously inaccessible biology in oncology and beyond.

**AI AND DATA-DRIVEN APPROACHES FOR TARGET DISCOVERY AND THERAPEUTIC DESIGN**

**1:35 Chairperson's Remarks**

*Marie-Eve Beaulieu, PhD, Co-Founder & Chief Development Officer, Peptomyc SL*

**1:40 Illuminating the Disease Surfaceome: Exploiting Conformational Targets for First-in-Class Cancer Therapies**

*Neal Goodwin, PhD, CSO, Research, Immuto Scientific*

Immuto Scientific has advanced technologies that identify cancer-specific protein conformations, called Surface Protein Conformers (SPCs), which expose epitopes that do not present in healthy cells. SPC target discovery through structural proteomics is combined with AI-powered antibody engineering, enabling the development of next-generation biologics, such as ADCs and multispecifics, tailored

for precise disease intervention. The SPC technology provides a key advantage by unlocking previously inaccessible therapeutic targets in challenging indications.

### **2:10 Mapping Cancer Vulnerabilities through the Cancer Dependency Map**

*Francisca Vazquez, PhD, Director, Cancer Dependency Map, Broad Institute*

DepMap systematically links tumor alterations to gene essentiality, supporting both basic and translational research. Many identified dependencies are now under validation or in clinical trials. Our recent work revealed a synthetic lethal interaction between the PELO/HBS1L and SKI complexes, suggesting PELO as a target in SKI-deficient cancers. DepMap continues to expand incorporating organoid models, new multiomics data modalities, and new features towards the goal of accelerating precision cancer medicine.

### **2:40 Beyond SSTR and PSMA: Human Data-Driven Discovery and *in silico* Design of Next-Generation Radiopharmaceutical Therapies**

*Hongyoon Choi, PhD, Associate Professor, Nuclear Medicine, Seoul National University Hospital*

This talk explores a data-centric and AI-driven strategy to identify and develop the next wave of radiopharmaceutical therapy (RPT) beyond SSTR and PSMA. By integrating human omics data, *in silico* modeling, and radioligand pharmacokinetics understanding, we establish a systematic framework for target discovery, ligand optimization, and therapeutic design in oncology. This approach bridges translational biology with computational innovation to accelerate new RPT pipelines.

### **3:10 Developing Highly Specific TCEs against pHLA with Molecular Specificity Mapping**

*Marvin Gee, PhD, Co-Founder & Vice President, Target Discovery, 3T Biosciences*

Peptide-HLAs are highly diverse tumor targets normally recognized by patient T cell immune responses. These targets can be discovered and targeted in solid tumors by leveraging off-the-shelf bispecific T cell engager therapies. We utilize an antibody-based discovery platform combined with high-throughput specificity mapping at the molecular resolution to develop highly potent T cell engagers. Preventing off-target specificity can ultimately improve the therapeutic index against pHLA targets.

### **3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing**

## **TARGETS FOR AUTOIMMUNE, CARDIOVASCULAR, AND OTHER INDICATIONS OUTSIDE CANCER**

### **4:15 Chairperson's Remarks**

*Marie-Eve Beaulieu, PhD, Co-Founder & Chief Development Officer, Peptomyc SL*

### **4:20 Enhanced Inhibition of Ocular Neovascularization with Novel Bispecific Receptor Decoy Proteins that Comprehensively Block Vascular Endothelial Growth Factor Ligands**

*Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University*

Ocular neovascularization causes severe vision loss and is driven by the upregulation of vascular endothelial growth factor (VEGF) ligands; hence therapeutics that antagonize VEGF proteins have greatly advanced ocular disease treatment. However, many patients do not show benefit, in part since current therapies do not comprehensively block VEGF activity. We introduce 2 promising bispecific receptor decoy proteins that inhibit all VEGF ligands and significantly reduce ocular neovascularization in animal models.

### **4:50 Multifunctional Antibody Agonists for the Treatment of Autoimmune Pulmonary Alveolar Proteinosis (Apap)**

*Stefan Zielonka, PhD, Professor, Biomolecular Immunotherapy, Technische Universität Darmstadt*

Autoimmune pulmonary alveolar proteinosis (aPAP) is a rare disorder characterized by myeloid cell dysfunction, pulmonary surfactant accumulation, and impaired innate immunity, resulting from autoantibodies targeting GM-CSF, a cytokine essential for macrophage function. In this talk, the development of GM-CSF receptor agonists engineered to resist neutralization by polyclonal autoantibodies will be presented. These agonists restore the function of macrophages and neutrophils, offering a promising strategy for overcoming immune dysregulation in aPAP.

### **5:20 ANTXR1 Antibodies as a Universal Therapy for Cancer and Cardiovascular Disease**

*Bradley D. St. Croix, PhD, Head Tumor Angiogenesis, Mouse Cancer Genetics Program, NIH*

Heart disease and cancer—the two leading causes of death—share fibrosis as a common culprit. ANTXR1/TEM8, a pathology-induced protein critical for collagen turnover, drives both tumor growth and heart injury. This lecture shows how ANTXR1-neutralizing antibodies, originally developed for cancer, also protect the heart

after myocardial infarction or pressure overload—reversing damage, restoring function, and revealing a shared mechanism linking two of humanity's deadliest diseases.

### **5:50 From Biology to IND: Paradox's Approach to Protein Misfolding Diseases**

*Yulong Sun, PhD, Co-Founder & CSO, Paradox Immunotherapeutics*

The challenge of protein misfolding disease is targeting the often-scarce misfolded and pathological forms of the protein that cause disease, while avoiding the abundant, healthy form which performs important roles in the body. At Paradox Immunotherapeutics, we utilize a validated, structure-based approach to predict misfolding-specific epitopes to generate antibodies that target pathological proteins for clearance while avoiding the natively-folded species to improve organ function in systemic amyloidosis.

### **6:20 Networking Reception in the Exhibit Hall with Poster Viewing**

### **7:20 Close of Emerging Targets in Oncology & Beyond Conference**



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

SC5: Safety &amp; Efficacy of Bispecifics and ADCs

\*Separate registration required. See short course page for details.

## THURSDAY, MAY 14

7:30 am Registration Open

7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast

Moderator: Catharine Smith, Executive Director, Termeer Foundation

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

Panelists:

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Noor Jaikhani, PhD, CEO &amp; Co-Founder, Matrisome Bio

8:30 Transition to Sessions

8:40 Organizer's Remarks

## ENGINEERING NEXT-GENERATION ADCs—BEYOND CYTOTOXIC PAYLOADS

8:45 Chairperson's Remarks

Sepideh Afshar, PhD, Senior Director, Head of Peptide Therapeutics, Genentech Inc.



**8:50 KEYNOTE PRESENTATION: Moving beyond Pan-Cytotoxic Payloads for ADCs: Next-Generation ADCs with Novel Targeted Payloads**

Gail D. Lewis, Distinguished Scientist, Discovery Oncology, Genentech, Inc.

Although ADCs with chemotherapy-like payloads have demonstrated impressive clinical benefit, serious toxicities remain a challenge. ADCs with unique, more targeted payloads may offer efficacious ADCs with an improved therapeutic index compared to traditional ADCs. Approaches for developing novel ADCs with non-pan-cytotoxic payloads will be discussed. The presentation will then focus on one selected intracellular target for an ADC payload and its

applicability across multiple tumor types.

## 9:20 177Lu-Labeled ADC: A Dual-Mechanistic Treatment Modality in Solid Tumors

Kyoji Tsuchikama, Assistant Professor, University of Texas Houston

While ADCs have shown clinical promise, their efficacy is often compromised by variable antigen expression within tumors. Compared to single-drug variants, our ADCs co-loaded with Lu177 and MMAE exhibited superior antitumor effects in xenograft tumor models with low or heterogeneous HER2/TROP2 expression, highlighting its advantage in overcoming heterogeneity-driven resistance. These advancements support our platform's potential to enable more effective and safer therapies for breast cancer and other treatment-resistant malignancies.

## 9:50 Pharmacokinetic Strategies to Increase the Safety and Efficacy of ADC Therapy

Joseph P. Balthasar, PhD, Professor, School of Pharmacy and Pharmaceutical Sciences, University of Buffalo, State University of New York

ADCs have ascended to a leading position among therapeutic modalities for oncology. However, great opportunities exist to engineer improvements in ADC safety and efficacy. This presentation discusses pharmacokinetic strategies that are under development for increasing ADC distribution within tumors, decreasing off-target exposure to payloads, and enhancing the selectivity of ADC delivery to cancer cells. The presentation will include discussion of the use of PBPK to guide engineering of multispecific ADCs.

## 10:20 Advancing Dual-Payload ADC Development with WuXi XDC's Proprietary WuXiDARx, X-LinC, and WuXiTecan-2 Platforms

Marie Zhu, CTO, WuXi XDC

To overcome resistance and narrow therapeutic windows of traditional ADCs, we advance dual-payload ADCs (dp-ADCs) via our proprietary platform (WuXiDARx for flexible DAR control, X-LinC stable connector, and hydrophilic WuXiTecan-2 payload-linker). This enables the streamlined generation of dp-ADCs in various formats (e.g., 6+2, 4+4, 4+2) through a simple process that requires no protein engineering. *In vivo*, a dp-ADC candidate shows ~10x wider therapeutic index with superior efficacy—toward safer, more potent cancer therapies

10:50 Coffee Break in the Exhibit Hall with Poster Viewing



## ENTREPRENEUR MEET-UP

Fostering Entrepreneurship and Models for Start-Ups

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Catharine Smith, Executive Director, Termeer Foundation

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

## PLENARY FIRESIDE CHAT



11:35 Plenary Fireside Chat Introduction

Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.

## 11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience



Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation

The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

Panelists:

Surge Biswas, PhD, Founder &amp; CEO, Nabla Bio, Inc.

Rebecca Croasdale-Wood, PhD, Senior Director, Augmented Biologics Discovery &amp; Design, Biologics Engineering, Oncology, AstraZeneca

Joshua Meier, Co-Founder & CEO, Chai Discovery  
Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi



12:35 pm Networking Luncheon in the Exhibit Hall and Last Chance for Poster Viewing

## LOGIC-GATED AND DUAL/MULTI-PAYLOAD ADCs

2:05 Chairperson's Remarks

*Nimish Gera, PhD, Founder and Principal Consultant, MABS R US Consulting*

### 2:10 Synthetic Targets Using Synthbody, a Novel Multivalent Multispecific Antibody-Drug Conjugate Platform That Utilizes Combinatorial Logic-Gated Control Demonstrates Log-Order Increased Internalization and Potency

*Ramesh Baliga, PhD, CSO, Synthetic Design Lab*

We describe a novel-engineered multivalent multispecific therapeutic approach (Synthbody) that enables targeting of combinatorial "synthetic" cancer targets. The Synthbody approach as an ADC leads to log order greater internalization and *in vitro* potency when compared with an approved benchmark or bispecific ADC approaches with its component binders. We highlight the streamlined discovery, layered logic-gated architecture, optimized developability, pharmacokinetics, and *in vivo* efficacy using an example Synthbody.

### 2:40 Novel Multi-Payload ADCs Assembled in One Step from Native Antibodies Show High Efficacy and Tolerability *in Vivo*

*Philipp Probst, Director, ADC Research, Araris Biotech AG*

The Araris' site-specific one-step conjugation technology aims at generating safe and highly potent ADCs without the need for antibody engineering. We present a novel Nectin-4 targeting triple-warhead ADC using a combination of MMAE and two different topoisomerase-1 inhibitors designed to treat a broad range of solid tumors, and demonstrate that the combination of multiple payloads in one ADC led to synergistic effects in mouse models while still being well tolerable.

### 3:10 Development of Next-Generation Dual-Payload ADCs

*Marco J Lobba, PhD, Co Founder & CEO, CatenaBio*

CatenaBio has developed highly stable, dual-payload ADC combination therapies, with tunable payload ratios. Our selective Multi-Payload Conjugate (MPC) conjugation platform allows the attachment of distinct payloads targeting different mechanisms of action at three unique sites on antibody scaffolds, replacing the unstable maleimide bond with a more stable C-Y bond. MPCs, targeted combination chemotherapies within a single molecule,

deliver superior efficacy with reduced toxicities to address shortcomings in current ADCs.

### 3:40 Accelerating Dual-Payload ADC Innovation through WuXi XDC's Integrated Discovery Services



*Gang Yin, Head, Discovery Service, WuXi XDC*

Dual-payload ADCs (dpADCs) are gaining momentum to overcome drug resistance and improve efficacy, but their complexity poses significant development challenges. WuXi XDC offers an integrated end-to-end platform to accelerate dpADC discovery and development. Its proprietary WuXiDARx technologies enable precise dual conjugation via interchain cysteines, or alternatively through orthogonal chemistries or branched linkers, each supporting flexible design and streamlined advancement from discovery to commercialization.

### 4:10 Networking Refreshment Break

## ANTIBODY-OLIGONUCLEOTIDE CONJUGATES (AOCs)

### 4:40 Next-Generation ADC for Targeted Immune Modulation: Oligonucleotide Payloads Differentiate from Cytotoxic Agents

*Hong I. Wan, PhD, President, CEO and Co-Founder, Tallac Therapeutics, Inc.*

Aiming to innovate beyond the traditional ADC approach to develop medicines with safer and more durable therapeutic profile, we established a next-generation ADC technology with novel oligonucleotide payloads, extending the therapeutic mechanism beyond cytotoxic agents. The presentation will highlight Tallac's novel Toll-like Receptor Agonist Antibody Conjugate (TRAAC) platform which employs a novel immune modulating oligonucleotide payload.

### 5:10 Next-Generation Antibody Conjugates: Delivery of Oligonucleotides for Neurological Indications

*Kerstin Hofer, PhD, Matrix & Science Lead, F. Hoffmann-La Roche AG*

Antisense-oligonucleotides are a promising drug modality for the treatment of neurological disorders, but their administration via intrathecal delivery is limiting the broader clinical application of ASOs. Our team's research focuses on conjugating the ASO to a Brainshuttle antibody that facilitates access to the central nervous system (CNS) via transcytosis at the blood-brain barrier. *In vivo* experiments suggest broad brain distribution and good duration of action.

### 5:40 Close of Day

## FRIDAY, MAY 15

7:15 am Registration Open

7:30 Chairperson's Remarks

*Gail D. Lewis, Distinguished Scientist, Discovery Oncology, Genentech, Inc.*

### 7:35 PANEL DISCUSSION: The Next Wave of ADCs: How China Is Shaping the Global Landscape



*Moderator: Jing Li, PhD, CEO, VelaVigo*

- R&D innovations driving China's ADC development—TCE-ADC, bispecific ADCs, and dual-payload ADCs
- Clinical development strategies
- Partnering and out-licensing strategies

*Panelists:*

*Yang Qiu, PhD, CSO & US GM, Duality Biologics*

*Ting Xu, PhD, CEO, AlphaMab Oncology Co Ltd.*

*Yongxin Robert Zhao, PhD, CEO & Chairman, Hangzhou DAC Biotech Co Ltd*



### 8:30 KEYNOTE PRESENTATION: The Story of Daiichi Sankyo's Pioneering DXd ADC Pipeline

*Gerold Meinhardt, MD, PhD, Vice President & Head, Global Teams Lead, Early Oncology, Daiichi Sankyo, Inc.*

Trastuzumab deruxtecan, an ADC comprised of a HER2-directed antibody and a topo-I payload, was the first DXd ADC to achieve approvals globally in various HER2-expressing cancers. This presentation will cover the characteristics of trastuzumab deruxtecan leading to its clinical activity and expand on the DXd ADC platform, which consists of several ADCs that combine different antibodies with the same payload to target a broad range of cancers.

## BISPECIFIC ADCs

### 9:00 Development of PD-L1 Centered ADC through Coformulation and 2-in-1 or Bispecific

*Ting Xu, PhD, CEO, AlphaMab Oncology Co Ltd.*

This presentation will showcase 3 assets owned by Innovent Biologics:

- JSKN033 - a high concentration, subcutaneous co-formulation of a PD-L1 inhibitor and a HER2 biparatopic ADC
- JSKN022 - a novel "2-in-1" bispecific ADC targeting PD-L1 and ITGB6
- JSKN027 - a tetravalent bispecific ADC targeting PD-L1 and VEGF2.

### 9:30 Preclinical and Clinical Development of ABL/NEOK Bio's Bispecific ADCs

Mayank Gandhi, CEO, NEOK Bio

Bispecific ADCs represent cutting-edge advancement whose design involves the intelligent choice of target antigens, antibody formats, linker, payload, and conjugation technology. We report on this dual-targeting strategy's potential to target a wider range of tumors, overcome drug resistance, increase internalization rates and cell killing, and improve the safety profile by increasing selectivity and reducing off-tumor toxicity

### 10:00 First-in-Class Bispecific ADC Programs from VelaVigo

Jing Li, PhD, CEO, VelaVigo

Two programs are showcased in this presentation. One is a FIC bispecific ADC targeting both CD79b and CD20, with preclinical data demonstrating superior efficacy compared to Polatuzumab Vedotin (PV) in both PV sensitive and resistant models, and excellent tumor inhibition in PDX model of Richter's syndrome. The other is a FIC bispecific anti-CDH17/CLDN18.2 ADC therapy, potentially addressing the limitation of targeting CLDN18.2 or CDH17 alone.

### 10:30 Networking Coffee Break

### CELL-FREE ADC MANUFACTURING

#### 10:45 STRO-004, a DAR8 Exatecan ADC Targeting TF

Daniel Calarese, PhD, Exec Dir Drug Discovery & Innovation, Drug Discovery & Innovation, Sutro Biopharma Inc

Exatecan-based ADCs have demonstrated superior antitumor responses across multiple tumor types compared with traditional tubulin inhibitors, yet their impact on progression-free survival (PFS) remains limited. This presentation will highlight clinical updates on STRO-004, a DAR8 Topo1i ADC targeting tissue factor, and preclinical data generated with our most advanced dual-payload ADCs, designed to transform strong initial responses into durable clinical benefit.

### ULTRA-HIGH DAR PLATFORMS FOR LOW-POTENCY WARHEADS

#### 11:15 Antibody-Drug Conjugates with Novel Payloads Are Enabled by an Ultra-High DAR Platform

Antonina Simakova, PhD, Executive Vice President, Research, Myris Therapeutics

Herein, we introduce a new antibody-drug conjugate class (HiDARs) featuring polymer scaffolds that carry 50–200 kinase inhibitor

payloads via cleavable linkers. Anti-HER2 conjugates incorporating PI3K/mTOR inhibitors exhibit potent activity in breast cancer tumor cells and demonstrate *in vivo* efficacy in mouse models. This platform broadens ADC payload diversity, enhancing safety and expanding applications beyond conventional cytotoxic payloads.

### 11:45 Antibody-Bottlebrush Conjugates for Targeted Cancer Therapy

Bin Liu, PhD, Assistant Professor, Biology and Biochemistry, Center for Nuclear Receptors and Cell Signaling, University of Houston

Antibody–drug conjugates are powerful targeted therapies but are limited by narrow payload diversity and chemical constraints. In this talk, I will introduce antibody–bottlebrush prodrug conjugates (ABCs) that overcome these barriers. ABCs feature antibodies covalently linked to polymeric bottlebrush prodrugs carrying diverse, tunable payloads at ultra-high drug-to-antibody ratios. This design enables precise tumor targeting, superior efficacy, and minimal toxicity in preclinical models, offering a promising next-generation therapeutic strategy.

### 12:15 pm Close of Summit

## PRESENT A POSTER

## SAVE \$50!

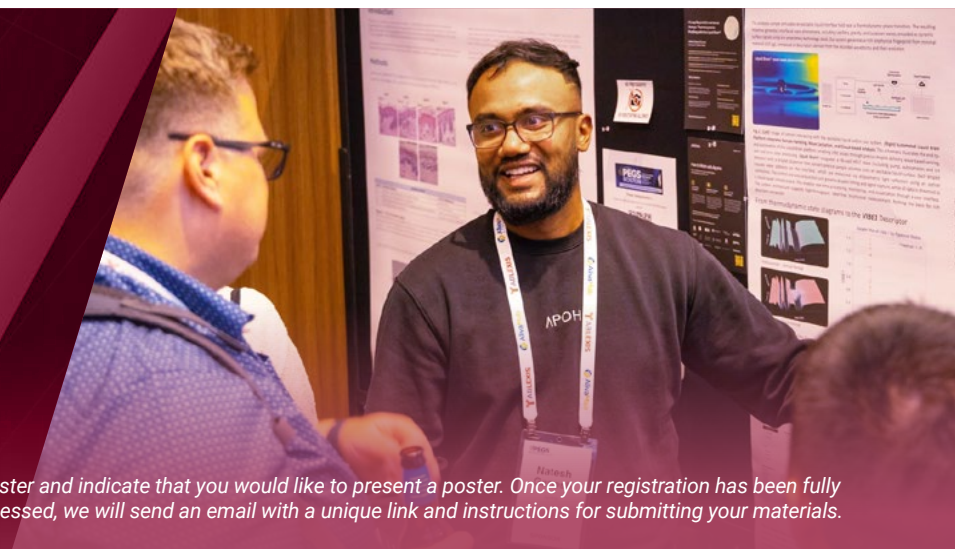
Cambridge Healthtech Institute encourages attendees to gain further exposure by presenting their work in the poster sessions. To secure an onsite poster board and/or ensure your poster is included in the conference materials, your full submission must be received, and your registration paid in full by **March 27, 2026**.

### Reasons you should present your research poster at this conference:

- Your research will be seen by our international delegation, representing leaders from top pharmaceutical, biotech, academic and government institutions
- Discuss your research and collaborate with other attendees
- Your poster will be published in our conference materials
- Receive \$50 off your registration

Register and indicate that you would like to present a poster. Once your registration has been fully processed, we will send an email with a unique link and instructions for submitting your materials.

Please see website for more details. [PEGSummit.com/Poster](https://www.pegsummit.com/Poster)



# MULTISPECIFICS STREAM

## Shaping the Future of Multispecific Antibody Therapeutics

The multispecific antibodies stream at the PEGS Boston Summit will review the latest developments from engineering and platform innovations to preclinical and clinical advancement in this burgeoning field. This year will feature the design of novel constructs, the mitigation of toxicity and optimization of efficacy, the proliferation of conditional activation and masking strategies, and emerging approaches to improved targeting. Don't miss out on the most significant forum of the year to learn about the latest trends and research results and meet face to face with leaders who are changing the future of biologics.



MULTISPECIFICS STREAM  
CONFERENCES

MAY 11-12

TRAINING SEMINAR:

### Introduction to Multispecific Antibodies: History, Engineering, and Applications

AGENDA

MAY 12-13

### Advancing Multispecific Antibodies and Combination Therapy to the Clinic

AGENDA

MAY 14-15

### Engineering Bispecific and Multispecific Antibodies

AGENDA



MONDAY, MAY 11, 2026 8:30 AM - 6:00 PM | TUESDAY, MAY 12, 2026 8:30 AM - 12:45 PM

## Introduction to Multispecific Antibodies: History, Engineering, and Applications

Introduction to Multispecific Antibodies is an informative and practical guide to getting up to speed on critical aspects of multispecific antibody therapeutics. Topics will include historical successes, failures, and lessons learned. Specific practical instruction will span mechanisms of action, engineering, developability, regulatory considerations, and translational guidelines. Perspectives on ideal implementation of multispecifics as targeted and immunomodulatory approaches will be discussed.



*Instructor: G. Jonah Rainey, PhD,  
Associate Vice President, Eli Lilly  
and Company*

### TOPICS TO BE COVERED:

- A brief history of bispecific antibodies: 60 years of progress with critical advances and key pioneers
- Bispecific applications and powerful mechanisms-of-action
- Engineering bispecific antibodies: 100 formats and counting
- Bispecific-specific considerations in preclinical development and regulatory landscape
- Developability, manufacturing, and analytical considerations
- Clinical experience, translation, and regulatory approval
- Current trends and future opportunities in regulating immune checkpoints, cell-based therapies, and personalized approaches

Cambridge Healthtech Institute Training Seminars offer real-life case studies, problems encountered and solutions applied, and extensive coverage of the basic science underlying each topic. Experienced Training Seminar instructors offer a mix of formal lectures, interactive discussions, and activities to help attendees maximize their learning experiences. These immersive trainings will be of value to scientists from industry and academic research groups who are entering new fields—and to those working in supporting roles that will benefit from an in-depth briefing on a specific aspect of the industry.

*Training Seminars will be held in person only. To ensure a cohesive and focused learning environment, moving between conference sessions and the training seminars is not allowed.*



### SUNDAY, MAY 10

#### 2:00 pm Recommended Pre-Conference Short Course

##### SC1: In silico and Machine Learning Tools for Antibody Design and Developability Predictions

\*Separate registration required. See short course page for details.

### TUESDAY, MAY 12

#### 1:50 pm Networking Coffee & Dessert Break in the Exhibit Hall with Poster Viewing

#### 2:20 Organizer's Opening Remarks

### CO-STIMULATORY BISPECIFIC AND TRISPECIFIC ANTIBODIES

#### 2:25 Chairperson's Remarks

Nathan D. Trinklein, PhD, Co-Founder and President, Rondo Therapeutics



#### 2:30 KEYNOTE PRESENTATION: A Novel T Cell Engager for Colorectal Cancer

JoAnn A. Suzich, PhD, Head, Research, Immunocore LLC

Microsatellite stable colorectal cancer (MSS CRC) with liver metastases are immunologically "cold" tumors resistant to immune checkpoint therapy. ImmTACs are a class of T cell engagers that might overcome the immunological barriers in CRC. We have identified and characterized a promising novel CRC target antigen and have employed innovative engineering approaches to generate a highly potent ImmTAC with enhanced specificity that may have therapeutic benefit in MSS CRC.

#### 3:00 EVOLVE: T Cell Engager Designs to Maximize Tumor Engagement with Integrated CD2 Costimulation

Jeremy S. Myers, PhD, Senior Vice President, R&D, EvolveImmune Therapeutics Inc.

Therapeutic design considerations for multiple-tumor antigen targeting to achieve maximal and selective tumor engagement and integration of TCR and selective costimulatory activation for optimal T cell effector activity to restore anti-tumor immunity in cancer patients.

#### 3:30 Accelerating T-Cell Engager Discovery by Functional Screening and AI-Assisted Engineering

Musheng Bao, VP & Head, Biology, Nona Biosciences



T cell engagers (TCEs) represent a transformative class of immunotherapy modalities. Nona leverages clinically validated, fully human HCab and H2L2 antibody building blocks to generate bi and multispecific TCEs. To address the limitations of binding based screens, we established a function based platform that directly measures antigen dependent T cell activation and cytotoxicity, integrated with AI assisted developability and biophysical engineering to accelerate TCE discovery and optimization.

#### 3:45 Beyond mAb: HUGO-Ab Enables Format-Ready Building Blocks for ADCs, TCE, and Multispecifics



Jenny Shan, Chief Scientific Advisor, Antibody Discovery, Cyagen Biosciences

Cyagen's HUGO-Ab is an integrated platform for antibody discovery and multispecific engineering, combining mAb, bispecific, and VHH modalities. Leveraging eKO to overcome immune tolerance, multi-strain immunization to expand epitope diversity, and diverse light chain architectures, it enables high-quality, developable leads. HUGO-Nano further supports rapid nanobody discovery with strong affinity and specificity.

#### 4:00 Refreshment Break in the Exhibit Hall with Poster Viewing

### SPEED NETWORKING

#### Speed Networking: How Many New Contacts Can You Make?

Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

#### 4:40 Advancing Cancer Immunotherapy with CD28-Engaging Bispecific Antibodies

Starlynn Clarke, PhD, Director, Preclinical Biology, Rondo Therapeutics

A new wave of immuno-oncology therapeutics is harnessing T cell costimulatory pathways to achieve transformative outcomes in difficult-to-treat cancers. Rondo Therapeutics' CD28 platform enables precise tuning of CD28 engagement, tailoring costimulation to each therapeutic context to maximize efficacy while preserving safety. Here, we highlight key platform design principles and provide an update on the clinical development of RNDO-564, the first CD28 x Nectin-4 bispecific antibody in development for advanced bladder cancer.

#### 5:10 Novel Costimulatory Bispecific Antibodies for the Combination Treatment of Solid Tumors

Theresa M. McDevitt, PhD, Vice President, Oncology Research, Third Arc Bio

Solid-tumor therapy with CD3-bispecifics remains a promising therapeutic approach; however, progress toward transformative clinical activity has been limited to date. Third Arc Bio has developed novel CD3 and CD28-based multispecific antibodies for the treatment of solid tumors. Lead programs have been developed for ovarian cancer, and preclinical data on our novel CD28 bispecifics demonstrate robust costimulation and synergy with CD3-TCEs including ARC101, a CDLN6xCD3 currently in clinical development.

#### 5:40 Tumor Selective CD47 targeting for the Treatment of Platinum Resistant Ovarian Cancer

Nicolas Fischer, PhD, CEO, Light Chain Bioscience

Blocking CD47 is an attractive therapeutic approach in oncology that has faced setbacks due to ubiquitous expression of this innate immune checkpoint. We have developed a bispecific approach, relying on unbalanced affinity arms to interfere with the SIRPa-CD47 "don't eat me" signal in a tumor antigen dependent way. This approach has now achieved clinical proof-of-concept in heavily pretreated, platinum-resistant ovarian cancer patients.

#### 6:10 Close of Day

#### 6:30 Recommended Dinner Short Course

##### SC6: Developability of Bispecific Antibodies

\*Separate registration required. See short course page for details.

### WEDNESDAY, MAY 13

#### 8:00 am Registration Open

### PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL

#### 8:25 Chairperson's Remarks

**8:30 Innovation in Protein Science with Young-Scientist Visionaries**

*Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco*

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.

**Panelists:**

*Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich*

*Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University*

*Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School*

*Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder*

*Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School*

**9:15 Coffee Break in the Exhibit Hall with Poster Viewing****MENTORING MEET-UP****Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship**

*Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies*

*Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University*

**BISPECIFICS FOR NON-ONCOLOGY APPLICATIONS****10:00 Chairperson's Remarks**

*Frank Comer, PhD, Senior Director, Quarry Thera*

**10:05 Multispecific Molecules Make for Multi Design Considerations: Early-Phase Trials with Lutikizumab**

*Martina Porter, MD, Vice Chair of Research and Academics, Department of Dermatology; Director, Clinical Laboratory for Epidemiology and Applied Research in Skin (CLEARS); Co-Leader, Pathogens, Immunity, and Inflammation Translational Research Hub, Beth Israel Deaconess Medical Center (BIDMC); Assistant Professor of Dermatology, Harvard Medical School*

This talk will explore early-phase clinical trials of lutikizumab, a dual-variable domain IgG targeting IL-1 $\alpha$  and IL-1 $\beta$ , in hidradenitis suppurativa, osteoarthritis, and inflammatory bowel disease. Key topics include the unique design considerations for multispecific antibodies, clinical results to date, strategies for translating across disease states, dosing challenges, and approaches to selecting optimal patient populations for these complex biologic therapies.

**10:35 A Bispecific Antibody that Inhibits PAD2 and PAD4 Activity and the Generation of Citrullinated Autoantigens**

*Gary P. Sims, PhD, Senior Director, Immunology Biosciences, AstraZeneca.*

Anti-citrullinated protein autoantibodies (ACPA) promote inflammation, joint tissue injury and define a poor prognostic group of patients with rheumatoid arthritis (RA). This autoimmune response is driven by citrullinated autoantigens generated by peptidylarginine deiminases (PADs). Herein, we describe the development and characterization of a bispecific antibody which blocks the extracellular enzymatic activity of PAD2 and PAD4 for the treatment of RA.

**11:05 Sequence-Forward Solutions by LAMPIRE for Monoclonal Antibody Discovery across Multiple Species**

*John Majercak, Head, Antibody Discovery, LAMPIRE Biological Labs Inc.*

Leveraging decades of expertise in small and large animal immunization, LAMPIRE Biologicals has deployed a robust, cost-effective solution for monoclonal antibody discovery. Our "Sequence-Forward" approach combines FACS, NGS, sequence analytics, recombinant expression and *in vitro* screening to isolate high-affinity, epitope-diverse heavy + light chain antibodies, chicken IgYs, single-domain vHH nanobodies, and ultra-long CDR3



bovine picobodies. We will provide a comprehensive technical overview of our platform while highlighting recent advancements in mRNA\_LNP *in vivo* campaigns and deep sequencing of the bovine picobody repertoire.

**11:35 Session Break****11:40 LUNCHEON PRESENTATION: Achieving High Titer & Superior Purity across Diverse Bispecific Antibody Formats**

*Jiansheng Wu, Senior Vice President & Head of CRO Services, WuXi Biologics USA LLC*

Bispecific antibodies (BsAbs) are at the forefront of therapeutic innovation, but their production is often hindered by challenges such as low titers and difficult-to-remove impurities like homodimers and mispaired species. Additionally, each BsAb format presents unique complexities in the production process. This presentation will showcase innovative solutions to these challenges, including ultra-high-titer CHO expression systems, optimized chain ratios, and Intact Mass-assisted purification processes tailored for various formats, such as CrossMab and scFv-Fab. Through detailed case studies, we will demonstrate how these approaches consistently achieve over 98% heterodimer purity and endotoxin levels below 0.1 EU/mg.

**12:10 pm Talk Title to be Announced**

*Jason Yasenchak, VP, Strategy for Multimodal Therapeutics, Product, Dotmatics*

**INTERACTIVE BREAKOUT DISCUSSIONS****12:40 Find Your Table and Meet Your Discussion Moderator****12:50 Interactive Roundtable Discussions**

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

**TABLE 4: Masking Approaches to Mitigate Off-Target Effects and Reduce Toxicity of Multispecifics**

*Volker Schellenberger, PhD, Senior Vice President, Research Oncology, Vir Biotechnology, Inc.*



- Preclinical models to show a widened therapeutic index
- Binding masks or steric masks?
- Methods to measure unmasking in tissues
- Design of protease cleavable linkers

#### TABLE 5: Antibodies to Watch in 2026: Mid-Year Update

Janice M. Reichert, PhD, Editor-in-Chief, mAbs

The “Antibodies to Watch” roundtable will focus on updates to the commercial late-stage clinical development, regulatory review, and marketing approval of antibody therapeutics in 2026. Discussion topics include:

- Trends in global antibody therapeutics approvals?
- Global development of innovative antibody therapeutics such as multispecific antibodies and antibody-drug conjugates
- Industry benchmarks such as development times and success rates
- Late-stage pipeline of over 200 antibodies and projections for their transition to marketing approval

### CONDITIONALLY ACTIVE BISPECIFICS: EMERGING STRATEGIES

#### 1:35 Chairperson's Remarks

Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.

#### 1:40 Click-to-Release for Controlled Immune-Cell Activation: Tumor-Targeted Unmasking of an IL12 Prodrug

Marc S. Robillard, PhD, CSO & Founder, Tagworks Pharmaceuticals

We developed a click-activatable IL12 cytokine prodrug by conjugating PEG masks to lysines via trans-cyclooctene linkers, which were designed to be tracelessly released upon click reaction with tetrazine. Intravenous administration of a targeted tetrazine conjugate to tumor-bearing mice, followed 24 hours later by the masked IL12, resulted in efficient unmasking of IL12 in the tumor, while avoiding IL12 activation in blood.

#### 2:10 Highly Selective T Cell Engagers Based on PRO-XTEN Protease-Releasable Masking Technology

Volker Schellenberger, PhD, Senior Vice President, Research Oncology, Vir Biotechnology, Inc.

PRO-XTEN technology enables drug candidates to become active (or unmasked) only where they are needed—in the tumor microenvironment—mitigating off-tumor damage and reducing toxicity. Three T cell engagers based on PRO-XTEN are currently in clinical trials. T cell engagers against multiple additional targets are in preclinical discovery.

#### 2:40 PANEL DISCUSSION: Deep Dive into Cell Engagers and Solid-Tumor Targeting Multispecifics

Moderator: Nina E. Weissner, PhD, Director, Multispecific Antibody Therapeutics, Zymeworks, Inc.

Diving into predictive biomarkers of response to TCE therapy. What T cell populations are driving antitumor responses? Are there mechanistic learnings from TCE responses that can be applied to solid tumors?

Panelists:

Stéphane Champiat, MD, PhD, Associate Professor, Department of Investigational Cancer Therapeutics, The University of Texas MD Anderson Cancer Center

David J. DiLillo, PhD, Executive Director, Immuno-Oncology, Regeneron Pharmaceuticals

JoAnn A. Suzich, PhD, Head, Research, Immunocore LLC

#### 3:10 Presentation to be Announced

#### 3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing



### PROTEASE-ACTIVATED ANTIBODIES

#### 4:19 Chairperson's Remarks

Volker Schellenberger, PhD, Senior Vice President, Research Oncology, Vir Biotechnology, Inc.

#### 4:20 Optimal Design of Masks for Protease-Activated Biologics: What Works, What Doesn't, and Why

Carolina T. Orozco, PhD, Senior Scientist, AstraZeneca

Masked biologics unlock the possibility to target antigens while limiting on-target off-tumor toxicity. When using affinity-based masks activated by proteolytic cleavage, the masks must strike a tough balance: strong inhibition of the antigen binding when the mask is covalently linked, yet also complete activation upon linker cleavage. This talk will elucidate the underlying parameters to reach a compromise between these contradictory objectives and thus enable the design of optimal masks.

#### 4:50 Protease-Activated Antibodies and Other Approaches for Conditional Immune Activation in Cancer Therapy

Sebastian Kobold, MD, Professor, Clinical Pharmacology, Klinikum der Universität München

Bispecific T cell-redirecting antibodies are powerful therapeutics for cancer treatment. However, in a target space dominated by surface antigens most frequently shared with normal cells, the amount of suitable antigens happens to be limited. Use of conditional bispecific formats rendering activation conditional to certain events

has the potential to derisk bispecific antibodies and to extend the target space. I will discuss several approaches from our team.

#### 5:20 Conditional Activation of T Cell Engagers through Tumor-Localized Prodrug Design

Amelia C. McCue, PhD, Postdoctoral Fellow, Translational Tissue Engineering Center, Johns Hopkins University

T cell engagers (TCEs) are potent cancer therapeutics but often cause toxicity due to antigen expression on healthy tissues. We structurally characterize a new anti-CD3 antibody, E10, and use it to engineer a pro-drug TCE activated by matrix metalloproteinase-2 (MMP-2), a tumor-overexpressed protease. MMP-2 cleavage restores T cell binding and tumor-selective killing. This masking strategy can be extended to other clinical anti-CD3 antibodies, offering a generalizable path to safer immunotherapies.

### TARGETED PROTEIN DEGRADATION

#### 5:50 A Novel CD123-Targeting Degradable Antibody Conjugate with Proprietary GSPT1 Degrading Payload for the Treatment of Acute Myeloid Leukemia

Maysoun Shomali, Executive Director, Orum Therapeutics

Acute myeloid leukemia (AML) remains a high-mortality malignancy with limited safe therapies. While gemtuzumab ozogamicin is approved, safety concerns limit its use. CD123 is highly expressed on leukemic blasts and stem cells, making it an attractive target. We developed ORM-1153, a CD123-targeted degrader antibody conjugate delivering a GSPT1 degrader. ORM-1153 shows potent *in vitro* and *in vivo* antileukemic activity, including TP53-mutant disease, with reduced hematopoietic toxicity, supporting further clinical development.

#### 6:20 Networking Reception in the Exhibit Hall with Poster Viewing

#### 7:20 Close of Advancing Multispecifics Conference



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

**SC1: In silico and Machine Learning Tools for Antibody Design and Developability Predictions**

\*Separate registration required. See short course page for details.

## TUESDAY, MAY 12

6:30 pm Recommended Dinner Short Course

**SC6: Developability of Bispecific Antibodies**

\*Separate registration required. See short course page for details.

## THURSDAY, MAY 14

7:30 am Registration Open

**7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast***Moderator: Catharine Smith, Executive Director, Termeer Foundation*

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

*Panelists:**Natalie Galant, PhD, CEO, Paradox Immunotherapeutics**Noor Jailkhani, PhD, CEO & Co-Founder, Matrisome Bio*

8:30 Transition to Sessions

8:40 Organizer's Remarks

**ENGINEERING TRISPECIFIC ANTIBODIES FOR SOLID-TUMOR AND AUTOIMMUNE INDICATIONS**

8:45 Chairperson's Remarks

*Shelley Force Aldred, PhD, Co-Founder and CEO, Rondo Therapeutics***8:50 TriTCE Co-Stim: A Differentiated T Cell Engager Platform with Conditional *cis* CD28 Co-Stimulation and Transferability to Diverse Targeting Strategies***Nina E. Weisser, PhD, Director, Multispecific Antibody Therapeutics, Zymeworks, Inc.*

The design and optimization of a trispecific with conditional CD28 engagement and obligate *cis* T cell binding will be discussed,

including enhanced and sustained T cell functionality and antitumor activity compared to bispecific cell engagers and safety in *in vitro* and *in vivo* models.

**9:20 Trispecific NK and T Cell Engagers: How Target Selection and Format Impact Potency, Safety, and Developability***Harald Kolmar, PhD, Professor and Head, Institute for Organic Chemistry and Biochemistry, Technische Universität Darmstadt*

We established several routes for the design of trispecific engagers with desired biophysical and functional properties. The strategy to discover and design heavy-chain-only binders paired with a common light chain will be highlighted. Alternatively, two-in-one antibodies were established, where two different targets are recognized individually by the VL and the VH domain, followed by amendment of additional binding modules to obtain symmetric trispecifics.

**9:50 From Bi- to Trispecific Antibodies: Reimagining the Next Generation of ADCs***Bonnie J. Hammer, PhD, Executive Vice President, Research & Development, Invenra*

Multispecific antibodies open new avenues of exploration within the ADC field. By targeting multiple tumor antigens, one common route of tumor escape through antigen loss can be avoided. Multispecifics also allow targeting of tumor matrix components alongside tumor antigens to assist in addressing tumors where the ECM prevents access to the tumor. Furthermore, biparatopics as well as conditional binding and internalization strategies can be utilized to enhance safety and efficacy.

**10:20 Structure-Guided Engineering of Secretory IgA Architecture***Sebastian Zoll, Head of Protein Analytics, Development, Icosagen*

Secretory IgA (sIgA) is central to mucosal immunity, but controlling its multimerization is challenging. We engineered framework mutations at Fc-Fc and J-chain interfaces to direct defined assembly states. The resulting variants reproducibly form dimeric, tetrameric, or pentameric sIgA while preserving antigen specificity, stability, secretion, and function. This establishes antibody framework regions as programmable determinants of IgA architecture for tailored multivalent therapeutics.

**10:50 Coffee Break in the Exhibit Hall with Poster Viewing**

## ENTREPRENEUR MEET-UP

**Fostering Entrepreneurship and Models for Start-Ups***Natalie Galant, PhD, CEO, Paradox Immunotherapeutics**Catharine Smith, Executive Director, Termeer Foundation*

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

## PLENARY FIRESIDE CHAT

**11:35 Plenary Fireside Chat Introduction***Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.***11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience***Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation*

The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

*Panelists:**Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.**Rebecca Croasdale-Wood, PhD, Senior Director, Augmented Biologics Discovery & Design, Biologics Engineering, Oncology, AstraZeneca**Joshua Meier, Co-Founder & CEO, Chai Discovery**Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi*



12:35 pm Networking Luncheon in the Exhibit Hall and Last Chance for Poster Viewing

## BISPECIFICS WITH NEW MECHANISMS OF ACTION

### 2:05 Chairperson's Remarks

G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company

### 2:10 Developing Induced-Proximity Strategies to Modulate Receptor Signaling in Inflammation and Cancer

Ricardo A. Fernandes, PhD, Group Lead, CAMS Oxford Institute, University of Oxford

We have developed induced-proximity platforms to modulate surface-receptor activity by recruiting endogenous enzymes. Our approach selectively inhibits immune-checkpoint and oncogenic-receptor signaling through targeted phosphatase recruitment, while conversely enhancing inhibitory receptor function via kinase recruitment. Additionally, we are mapping general principles that drive effective receptor dimerization at the cell surface, enabling modulation of receptor complexes which are not naturally associated.

### 2:40 Discovery and Development of an ALK1-BMPRII Agonistic Clustering Antibody to Treat Hereditary Hemorrhagic Telangiectasia

Melissa Geddie, PhD, Vice President Drug Discovery, Diagonal Therapeutics

Clustering antibodies present a compelling approach to treat diseases driven by defective signaling pathways, but their discovery has been limited by the difficulty of identifying epitopes that successfully trigger receptor signaling. Using a combination of physics-aware deep learning and experimental approaches, we successfully generated bispecific agonist antibodies against ALK1 and BMPRII that activate the signaling complex and treated HHT pathologies in various mouse models.

### 3:10 Bispecific Antibody Mixtures as a Strategy to Selectively Harness T Cell Cytokine Receptors and Co-Stimulation in Cancer Therapy

Walter G. Ferlin, PhD, CSO, Light Chain Bioscience a brand of Novimmune SA

Bispecific antibody mixtures provide a novel means to achieve controlled receptor agonism of T cell cytokine and co-stimulatory pathways. In contrast to native cytokines or monoclonal antibodies, which are constrained by systemic toxicity, this approach enables localized and selective pathway engagement to drive potent

anti-tumor immunity. These findings demonstrate how bispecific antibodies can safely unlock immune mechanisms that have previously been inaccessible for therapeutic intervention.

### 3:40 Presentation to be Announced

### 4:10 Networking Refreshment Break

### 4:40 PANEL DISCUSSION: Engineering CAR Ts and Bispecifics to Achieve Better Outcomes: B Cell Depletion and Beyond

Moderator: G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company

#### Panelists:

Yvonne Y. Chen, PhD, Professor, Microbiology & Immunology & Molecular Genetics, University of California, Los Angeles

Laszlo G. Radvanyi, PhD, Professor, Department of Biochemistry, Microbiology and Immunology, University of Ottawa; Senior Scientist, Ottawa Hospital Research Institute

### 5:40 Close of Day

## FRIDAY, MAY 15

### 7:15 am Registration Open

## INTERACTIVE ROUNDTABLE DISCUSSIONS

### 7:30 Interactive Roundtable Discussions with Continental Breakfast

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

### TABLE 3: Cis-Acting Bispecifics: Rewiring Receptor Signalling at the Cell Surface

Ricardo A. Fernandes, PhD, Group Lead, CAMS Oxford Institute, University of Oxford

- What should cis-bispecifics actually do?
- Can induced proximity reveal new biology?
- Designing for function
- Exploring synergy and combination strategies



## BISPECIFIC CHECKPOINT INHIBITORS

### 8:25 Chairperson's Remarks

Eugene A. Zhukovsky, PhD, Vice President and Site Head, Biologics R&D, Orion Pharma



### 8:30 KEYNOTE PRESENTATION: Engineering Multi-Pronged CAR T Cell Therapy for Cancer

Yvonne Y. Chen, PhD, Professor, Microbiology & Immunology & Molecular Genetics, University of California, Los Angeles

Here, I will discuss the development of next-generation T cells that can target multiple cancer antigens, modify the tumor microenvironment, and/or engage endogenous immunity to overcome tumor-defense mechanisms. This presentation will highlight the potential of synthetic biology in generating novel mammalian cell systems with multifunctional outputs for therapeutic applications.

### 9:00 Enhancing Antitumor Immunity through Simultaneous Blockade of Two Immune Checkpoints Using a Tetravalent Bispecific Antibody

Anil K. Thotakura, PhD, Immuno Oncology Head, R&D, Orion Pharma.

Tetravalent bispecific antibodies (BsAbs) represent an emerging class of immunotherapeutics designed to enhance functional avidity and dual-target engagement compared with conventional bivalent formats.

### 9:30 Leveraging T Cell Co-Stimulation for Enhanced Therapeutic Efficacy of Trispecific Antibodies

Liqiang Pan PhD, Associate Dean and Qiushi Distinguished Professor/ Full Professor, School of Pharmaceutical Sciences, Zhejiang University; Adjunct Professor, The Second Affiliated Hospital of Medical School, Zhejiang University Laboratory of Precision Medicine and Biopharmaceuticals, College of Pharmaceutical Sciences, Zhejiang University

The efficacy of bispecific antibodies against solid tumors is limited by intratumoral T cell dysfunction and inadequate persistence. The co-stimulatory domains of 4-1BB, OX40, and CD28 are widely used in engineering CAR T cells to augment T cell responses. We designed three co-stimulatory trispecific T cell-engaging antibodies that target prostate-specific membrane antigens (PSMAs), CD3, and an additional co-stimulatory receptor, such as OX40, 4-1BB, and CD28, to tune T cell activity.



## NOVEL CONDITIONALLY ACTIVE FORMATS

### 9:59 Chairperson's Remarks

*Mahiuddin Ahmed, PhD, President and CSO, VITRUVIAE*

### 10:00 Single-Chain Fab-Based Prodrug Approaches for Chain-Exchange Conditional Activation of T Cell Engager Functionality

*Ulrich Brinkmann, PhD, Expert Scientist, Pharma Research & Early Development, Roche Innovation Center, Munich*

Prodrug-activating chain exchange (PACE) approaches apply two inactive antibody derivatives that, upon co-accumulation on tumor cells, reconstitute prodrug functionality. Single-chain Fab PACE harbors functional Fc domains to improve pharmacokinetic properties, and places the effector prodrug domains into linker-connected Fab arms which reduces the risk of nonspecific prodrug activation.

### 10:30 Networking Coffee Break

### 10:45 Conditionally Active CD28xVISTA Bispecific Antibodies Promote Myeloid-Driven T Cell Activation

*Edward van der Horst, PhD, Formerly CSO, Sensei Bio*

We developed pH-selective CD28xVISTA bispecific antibodies that conditionally co-stimulate T cells within the acidic, myeloid-rich tumor microenvironment. By engaging VISTA on tumor-associated myeloid cells, our lead bispecific drives localized CD28 activation and enhances anti-tumor immunity. Functional studies demonstrated potent, VISTA-dependent T cell activation without systemic cytokine release. This approach broadens the immunotherapy toolbox, offering a novel paradigm for safe and effective tumor-selective co-stimulation.

### 11:15 Conditional by Design: Engineering Synapse-Gated Trispecific T Cell Engagers for Improved Therapeutic Index

*Even Walseng, PhD, Director, Protein Engineering and Novel Modalities, Biologics Engineering, AstraZeneca R&D*

T cell engagers are potent immunotherapeutic modalities. However, their broad application is constrained by on-target, off-tumor toxicity and CRS, resulting in a narrow therapeutic index. We present the development of a conditional, dual-antigen targeting trispecific TCE (TriMab) that integrates a synapse-gated design with affinity-tuned binding arms to achieve AND-gated tumor selectivity. Our work establishes synapse-gated, dual-targeting trispecifics as a next-generation framework for engineering safer and more precise T cell therapeutics.

### 11:45 Close of Summit



“I found PEGS to be incredibly valuable and highly relevant to my role as a scientist in the pharmaceutical industry. It gave me an industry-wide perspective on current trends and state-of-the-art technologies in the field of drug design, development and analytics.”

Mahalia S., Principal Scientist, Bristol Myers Squibb

# IMMUNOTHERAPY STREAM

## Supercharging the Next Era of Immunotherapies

The Immunotherapy Stream at PEGS brings together the boldest innovations shaping the next era of immunotherapies for cancer, autoimmune disease, and beyond. Across three dynamic tracks, the program showcases breakthroughs in T cell and immune-cell engagers, immune engineering, microbiome, cellular therapies, and *in vivo* reprogramming powered by RNA, viral vectors, and AI. Part 1: T Cell Engagers spotlights the next wave of immune-cell engagers designed for greater safety, efficacy, and precision. Part 2: Advances in Immunotherapy dives into strategies to overcome resistance and persistence, engineer safer, smarter cell therapies, and unlock new opportunities in solid tumors and autoimmune conditions. Part 3: Next-Generation Immunotherapies looks to the rapid rise of *in vivo* immune cell reprogramming, new targets, oncolytic viruses, nanomedicine, and AI/ML-guided discovery of novel targets, including the dark genome. Don't miss out on the latest technologies and science driving the next era of immunotherapies.



IMMUNOTHERAPY  
STREAM  
CONFERENCES

MAY 11-12

## Emerging T Cell Engagers

AGENDA

MAY 12-13

## Advances in Immunotherapy

AGENDA

MAY 14-15

## Next-Generation Immunotherapies

AGENDA



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

**SC3: Challenges and Opportunities in Solid Tumor and Autoimmune Disease Therapeutics**

\*Separate registration required. See short course page for details.

## MONDAY, MAY 11

7:00 am Registration and Morning Coffee

8:20 Organizer's Opening Remarks

**COMPARING AND COMBINING TCEs, ADCs, CAR Ts AND RADIOIMMUNOTHERAPY**

8:25 Chairperson's Remarks

*Daniel A. Vallera, PhD, Lion Scholar; Director, Section on Molecular Cancer Therapeutics; Professor, Therapeutic Radiology, University of Minnesota Masonic Cancer Center***8:30 KEYNOTE PRESENTATION: Comparing TCEs and CAR T Cell Therapies: What Have We Learned So Far?***Patrick Baeuerle, PhD, Chief Scientific Advisor, Cullinan Therapeutics, Inc.*

T cell-engaging antibodies (TCEs) are bispecific, antibody-based adaptor proteins that connect any kind of cytotoxic T cells with select target cells for redirected lysis. Over the last three years, TCEs have seen an unparalleled surge in approvals as a standalone therapy. A total of twelve TCEs are now approved that very effectively treat hematological as well as solid-tumor indications. I will in-depth compare TCEs with CAR-T cell therapies.

**IMPROVING TCE SAFETY AND EFFICACY**

9:00 Chairperson's Remarks

*Alan J. Korman, PhD, CSO, Bluesphere Bio***9:01 FEATURED PRESENTATION: Next-Generation TCEs: Update from Amgen***Andrew Rankin, PhD, Executive Director, Immunology, Amgen Inc.*

Tumor-restricted antigens are essential for safe, effective T cell engagers (TCEs), yet truly tumor-specific targets are rare. Avidity- and dual-targeting designs expand opportunity and

improve tolerability, but the added complexity drives potency-developability tradeoffs. Leveraging an AI-informed protein design strategy informed by large historical datasets can guide TCE engineering, prospectively de-risking biophysical liabilities, accelerating iteration, and increasing the likelihood of candidates with strong molecular quality and robust activity in patients.

**TARGETING SOLID TUMORS****9:30 Leveraging Single-Cell Sequencing to Identify Highly Precise Single and Combination T-Cell Engager Targets***Alexander J Martinko, PhD, Senior Director, Antibody Engineering & Design, Cartography Biosciences Inc.*

TCE progress in solid tumors is often limited by the challenge of identifying targets that combine strong tumor activity with acceptable safety. This presentation will describe approaches that integrate large scale single cell transcriptomic data to guide target discovery and prioritization. The talk will highlight strategies for identifying highly tumor selective antigens and advancing next generation multi specific T cell engager designs aimed at improving precision and therapeutic index.

**10:00 Presentation to be Announced by genOway****10:30 Networking Coffee Break****11:00 Novel CD8-Guided T Cell Engagers for Cancer Therapy***Saso Cemerski, PhD, Head, Immune Cell Engagers, AstraZeneca***11:30 MAIT Engagers Offer a Large Therapeutic Window for the Treatment of Cancer***Simon Plyte, PhD, CSO, R&D, Biomunex Pharmaceuticals*

MAIT cells are an abundant, tissue and tumor resident, potent cytotoxic T cell subset. MAIT engagers (bispecific BiXAb antibodies) induce efficient tumor cytotoxicity but, in contrast to CD3 engagers, do not cause cytokine release. MAIT engagers do not induce regulatory T cell activation and are thus not dampened by increased immune suppression in the tumor. The increased safety and activity, especially in T-reg-rich tumors, affords a large therapeutic window.

**12:00 pm Session Break****12:10 LUNCHEON PRESENTATION: Engineering Trispecific CD3×CD28 T-Cell Engagers: Systematic Optimization of Affinity, Format, and Co-Stimulation***Bryan Glaser, Sr VP Bus Dev, Bus Dev, Invenra Inc*

Bispecific T-cell engagers have transformed treatment of hematologic malignancies, yet solid tumors remain a formidable challenge. A key barrier is T-cell exhaustion, where CD3 engagement alone is insufficient to drive durable anti-tumor responses. Adding CD28 co-stimulation to create trispecific CD3×CD28×TAA antibodies addresses this limitation directly, but optimal activity requires careful engineering of affinity, epitope, and molecular orientation. This talk will present a systematic approach to trispecific TCE design, exploring how CD3 and CD28 affinity combinations and format selection drive tumor killing, T-cell activation, and proliferation. Data from head-to-head comparisons of optimized trispecific and bispecific formats reveal striking activity differences and establish clear design principles for next-generation T-cell engagers.

**12:40 Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own****1:10 Session Break****1:15 Chairperson's Remarks***Alexander J Martinko, PhD, Senior Director, Antibody Engineering & Design, Cartography Biosciences Inc.***1:20 Development of a First-in-Class T Cell Receptor  $\beta$  Chain-Directed T Cell Engager to Treat Solid Tumors***Madan Katragadda, PhD, Senior Vice President & Head, Research and Technology, Marengo Therapeutics*

This presentation will describe the development of a first-in-class T cell engager designed to target the T cell receptor  $\beta$  chain as a novel entry point for treating solid tumors. It will outline the overarching concept, general engineering strategy, and supporting preclinical observations.

**1:50 T Cell Engagers Targeting Common Driver Mutations Enable Tumor-Exclusive Activity***Vipin Suri, PhD, CSO, Clasp Therapeutics*

T cell engagers (TCEs) can redirect immune cells to eliminate solid tumors, but their therapeutic index is limited by the scarcity of truly tumor-specific antigens that remain expressed under immune pressure. Neoantigens from driver mutations are both tumor-exclusive and essential for survival. Clasp's TCEs targeting p53 and KRas neoantigens demonstrate high selectivity and potent anti-tumor activity in preclinical models, offering a precision approach to immunotherapy.

**2:20 EM1032, a First-in-Class Bispecific TCE**



## targeting ALPP/G for the Treatment of Ovarian and Pancreatic Cancers.

Chengbin Wu, PhD, Founder & CEO, EpimAb Biotherapeutics, Inc.

EM1032 is a first in class T cell engager targeting ALPP/G and CD3, with encouraging preclinical activity across solid tumor models. This presentation will provide an overview of the molecule's antitumor potential, including findings in ovarian cancer and KRAS mutant settings, as well as combination strategy insights. The talk will also highlight translational observations on immune infiltration and share preclinical safety data supporting the continued clinical development of EM1032.

## EXPANDING INTO AUTOIMMUNITY AND INFLAMMATION

### 2:50 Luminescence-Based Potency Bioassays for CAR-T and T Cell Engager Therapies in Autoimmune Disease



Julia Gilden, Sr Scientist, R&D Integrated Biology, Promega Corp

CAR-T cells and T cell engagers are emerging treatments for autoimmune conditions, yet potency testing remains a bottleneck. We present two luminescence-based platforms supporting both modalities. The HiBiT Target Cell Killing assay quantifies effector-mediated killing of autoreactive targets for CAR-T and bispecific formats alike. A T cell activation reporter assay provides mechanism-of-action-reflective potency assessment for CAR-T and lentiviral vector programs.

### 3:20 Networking Coffee & Refreshment Break

### 4:05 Transition to Plenary Keynote Session

## PLENARY KEYNOTE



### 4:15 Plenary Keynote Introduction

G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company



### 4:25 CARs 2026: New Models and New Runways

Michel Sadelain, MD, PhD, Director, Columbia University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center

T cell engineering holds great promise for the treatment of cancers and other pathologies. The original chimeric antigen

receptor (CAR) prototypes targeting CD19 are now giving way to further refined receptors endowed with greater sensitivity and combinatorial possibilities. Emerging new targets and engineering tools augur favorably for broadening the use of CAR therapies.

## YOUNG SCIENTIST KEYNOTE



### 5:10 Deep Learning-Based Binder Design to Probe Biology

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Protein-protein interactions are central to biology and drug discovery, yet traditional antibody generation is slow and costly. BindCraft is an open-source, automated computational pipeline for *de novo* protein binder design that routinely yields nanomolar binders with 10-100% experimental success, without high-throughput screening or maturation. We illustrate applications to peptides, cell-surface receptors, allergens, and gene editors, and outline how deep-learning workflows can accelerate next-generation therapeutics, diagnostics, and bioprocessing.

### 5:55 Welcome Reception in the Exhibit Hall with Poster Viewing

## YOUNG SCIENTIST MEET-UP

### Young Scientist Meet-Up

Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University

Gian Marco Visani, PhD Graduate Student, University of Washington

Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology

This young scientist meet-up is an opportunity to get to know and network with mentors of the PEGS community. This session aims to inspire the next generation of young scientists by giving direct access to established leaders in the field.

- Get to know fellow peers and colleagues
- Make connections and network with other institutions
- Discuss the role of mentors and peers role models in the field

### 7:15 Close of Day

## TUESDAY, MAY 12

### 7:45 am Registration and Morning Coffee

## AI/ML APPROACHES, LOGIC-GATED TCEs

### 8:30 Chairperson's Remarks

Rachel Rennard, PhD, Senior Vice President, Research, Stereo Biotherapeutics

### 8:35 AbiLeap—A Platform to Build Logic-Gated CD3-Based Immune Engagers

Allison Nixon, PhD, Head, Platform Sciences, Ability Biotherapeutics

Ability Biotherapeutics developed AbiLeap, an AI-enabled platform that systematically designs conditionally active, logic-gated antibodies. Focusing on CD3 and select tumor antigens such as mesothelin, these molecules overcome key therapeutic limitations by activating only in the tumor microenvironment while remaining inert in normal tissue. We demonstrate how AbiLeap enables on-demand generation of large antibody sets meeting defined design criteria for the efficient creation of logic-gated immune engagers.

### 9:05 Optimizing TCEs for Selective Tumor-Cell Killing through Machine Learning and High-Throughput Functional Screening

Winston Haynes, PhD, Vice President, Computational Sciences and Engineering, LabGenius Therapeutics

LabGenius Therapeutics' platform leverages avidity-driven selectivity to overcome T cell engager (TCE) challenges, including on-target, off-tumor toxicity. We describe how the closed-loop integration of high-throughput experimentation with machine learning has facilitated the discovery and optimization of multispecifics for function and developability. We share *in vitro* data demonstrating selective tumor-cell killing, alongside *in vivo* data highlighting the efficacy and tolerability of our lead asset, a highly tumor-selective bispecific TCE.

## MULTISIGNAL T CELL ACTIVATION

### 9:35 Targeting Alternative T Cell Effector Pathways to Enhance the Anti-Tumor Activity of CD3-Engaging Bispecific Antibodies

David J. DiLillo, PhD, Executive Director, Immuno-Oncology, Regeneron Pharmaceuticals

Preclinical and clinical data support combinations of bispecific antibodies engaging distinct T cell signaling pathways. Co-localizing signal 1 (TCR/CD3) and signal 2 (costimulation) within the tumor microenvironment by combining CD3-engaging and costimulatory



pathway-engaging bispecific antibodies drives superior anti-tumor responses. Integrating signal 3 (cytokine support) through targeted delivery of cytokine signaling also enables deeper and more durable anti-tumor responses.

### **10:05 Optimizing NK Cell Therapy Using Multi-Functional Tri-Specific Killer (TriKE) Engagers to Treat Cancer**

*Jeffrey Miller, MD, Director, Masonic Cancer Center; Professor of Medicine, Division of Hematology, Oncology and Transplantation, University of Minnesota*

NK cells can induce remissions in patients with refractory leukemia. However, they lack specificity. To make NK cells antigen specific, we developed a Trispecific Killer Engagers (TriKEs), that engages NK cells (camelid anti-CD16) and tumor antigen with IL-15 between them. The goal of this therapy is to create immune synapses *in vivo* to target and activate endogenous NK cells to optimally treat leukemia (anti-CD33) and solid tumors (B7H3).

### **10:35 Coffee Break in the Exhibit Hall with Poster Viewing**

### **11:15 Conditionally Active CD3 and Costimulatory T Cell-Engager Programs for Autoimmunity and Solid-Tumor Indications**

*Tony R. Arulanandam, DVM, PhD, CEO and Founder, Synaptimmune Therapeutics*

Synaptimmune Therapeutics, in collaboration with Lyvgen Biopharma, is developing conditionally active CD3 and costimulatory T cell engagers (TCE) for autoimmune diseases and solid tumors. Leveraging our proprietary conditionally active (hidden CD3 binder) and integrated costimulation TCE platform (TROY-Ig), we have developed more potent and safe conditionally active 4-1BB costimulatory CD19 x CD20 TCEs (SYN8034) for autoimmunity and conditionally active CD2 costimulatory DLL3 TCEs (SYN8463) for SLC solid-tumor clinical development.

### **11:45 Next-Generation Small-Format TCRs for Multispecific Immune Cell Engagement**

*Rachel Rennard, PhD, Senior Vice President, Research, Stereo Biotherapeutics*

Tumor heterogeneity limits the efficacy of T Cell Engagers in solid tumors. Stereo has developed a robust, target-agnostic platform to discover and optimize Trackers, soluble small format TCRs. Trackers exhibit target specificity and antibody-like developability, and can be easily reformatted into multispecific T Cell Engagers (TCE). Here we show the robust functional activity of Tracker TCEs, supporting this novel molecule's potential to overcome heterogeneity challenges in solid tumors.

## **RNA-ENCODED TCEs**

### **12:15 pm RNA-Encoded T Cell Engagers for Immunotherapy of Multiple Myeloma**

*Elizabeth Carstens, MD, Instructor, Dana-Farber Cancer Institute*

Oncology has arguably the greatest potential to benefit from mRNA technology, as antibody-based immunotherapies, which can easily be encoded as mRNA, have revolutionized care for many cancer types. Despite recent advances, multiple myeloma (MM) remains a largely incurable malignancy where patients cycle through many therapies. We have developed dual-targeting mRNA-encoded T cell engagers for combination treatment of MM, to improve depth and durability of remission.

### **12:45 Session Break**

**12:50 Luncheon Presentation** (*Sponsorship Opportunity Available*) or **Enjoy Lunch on Your Own**

**1:20 Luncheon Presentation** (*Sponsorship Opportunity Available*) or **Enjoy Lunch on Your Own**

**1:50 Close of Emerging T Cell Engagers Conference**

**6:30 Recommended Dinner Short Course**

**SC8: The Dark Proteome: Unlocking Novel Targets for Next-Generation Biologics**

\*Separate registration required. See short course page for details.

**SUNDAY, MAY 10****2:00 pm Recommended Pre-Conference Short Course****SC3: Challenges and Opportunities in Solid Tumor and Autoimmune Disease Therapeutics**

\*Separate registration required. See short course page for details.

**TUESDAY, MAY 12****1:50 pm Networking Coffee & Dessert Break in the Exhibit Hall with Poster Viewing****2:20 Organizer's Opening Remarks****IMPROVING THE OUTCOME OF IMMUNOTHERAPIES****2:25 Chairperson's Remarks**

*William Redmond, PhD, Member and Director, Immune Monitoring Laboratory, Earle A. Chiles Research Institute, Providence Cancer Institute*

**2:30 KEYNOTE PRESENTATION: Manipulating the Commensal Microbiome to Improve Immunotherapy Efficacy**

*Thomas F. Gajewski, Abbvie Foundation Professor, Pathology & Cancer Research, University of Chicago*

Gut bacteria have been identified that are enriched in anti-PD-1 responders versus non-responders. Mechanistic experiments have demonstrated a causal relationship through immune mechanisms. Anaerobic culture methods are identifying specific bacteria that either promote or inhibit anti-tumor immunity. Prebiotics are being uncovered that can expand favorable bacteria *in vivo*, and metabolites liberated by those bacteria are also being identified and studied for functional effects.

**3:00 HLA-Agnostic T Cell Receptor Recognition of Cancer**

*Andrew Sewell, PhD, Distinguished Research Professor & Wellcome Trust Senior Investigator, Division of Infection and Immunity, Cardiff University School of Medicine*

We identify dominant anticancer T cell clonotypes from patients who clear metastatic cancer. While some recognize HLA-restricted neoantigens, others use a single TCR to target multiple different shared tumor-associated antigens across diverse cancers. Remarkably, some clonotypes recognize many tumor types without

HLA restriction. These HLA-unrestricted TCRs and their ligands overcome a central barrier in T cell immunotherapy, opening new paths toward broadly applicable treatments across patients and cancer types.

**3:30 Mechanism-Driven Cell-Based Assays to Screen & Characterize Bi- and Multispecific Antibodies**

*Jennifer Lin-Jones, Associate Director, Assay Development, R&D Department, Eurofins DiscoverX*

Advances in cancer immunotherapy have driven rapid growth in bi-specific and multi-specific antibodies that drive coordinated immune response modulation. As these modalities gain clinical traction, robust functional assays are essential to accelerate discovery and reduce risk. This presentation highlights cell-based cytotoxicity, receptor dimerization, and signaling assays, with case studies demonstrating mechanistic insight and target-specific validation for individual arms.

**4:00 Refreshment Break in the Exhibit Hall with Poster Viewing****4:10 Speed Networking**

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

**SPEED NETWORKING****Speed Networking: How Many New Contacts Can You Make?**

*Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute*

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

**4:40 Fas Ligand Blockade in Cancer Immunotherapy**

*Matthew Taylor, MD, Full Member, Developmental Cancer Therapeutics Laboratory, Earle A. Chiles Research Institute, Providence Cancer Institute*

T cell homeostasis is regulated in part by the extrinsic cell death pathway mediated by fas ligand (FasL) binding to the Fas receptor. Tumor-specific T cells undergo apoptosis following interaction with FasL. In preclinical studies, blockade of FasL results in improved T cell persistence, tumor infiltration and antitumor efficacy. FasL inhibition may represent a novel cancer immunotherapy and could

augment the efficacy of immune checkpoint inhibitors and adoptive cell therapies.

**NOVEL BISPECIFICS AND IMMUNE CELL ENGAGERS****5:10 High-Throughput Engineering of Novel Bispecific Antibodies for Cancer**

*Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School*

Bispecific antibodies (bsAbs) have emerged as one of the most promising therapeutic modalities in cancer. We have developed a high-throughput platform to engineer and test the function of bsAbs at scale. Our approach has been successfully applied to discover novel bsAbs that target cancer cells, macrophages, or T cells. In the future, this system could be applied to test libraries of 100,000s of bsAbs for cancer or other life-threatening diseases.

**5:40 A Novel Platform Technology for the Development of NK Cell-Based Cellular Immunotherapies—Opportunities for Combinations**

*Matthias Peipp, PhD, Research Head & Mildred Scheel Professor, Stem Cell Transplantation & Immunotherapy, University of Kiel*

This talk will outline a platform designed to support the development of NK cell-based immunotherapies. It will look at how these therapies can be applied across different diseases and where they may offer advantages. The session will also touch on opportunities to combine NK cell therapies with NK cell engagers, highlighting how these approaches may work together to expand treatment options in the future.

**6:10 Close of Day****6:30 Recommended Dinner Short Course****SC8: The Dark Proteome: Unlocking Novel Targets for Next-Generation Biologics**

\*Separate registration required. See short course page for details.

**WEDNESDAY, MAY 13****8:00 am Registration Open**



## PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL

### 8:25 Chairperson's Remarks

### 8:30 Innovation in Protein Science with Young- Scientist Visionaries



Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.

#### Panelists:

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School

Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder

Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School

### 9:15 Coffee Break in the Exhibit Hall with Poster Viewing

## MENTORING MEET-UP

### Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship

Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

## TARGETING SOLID TUMORS

### 10:00 Chairperson's Remarks

Daniel J. Powell Jr., PhD, Professor, Pathology & Laboratory Medicine, University of Pennsylvania

### 10:05 Overcoming Challenges in CAR T against Solid Cancers: Phase I Study and Back to Bench

Moonsoo M. Jin, PhD, Professor of Radiology, Academic Institute, Houston Methodist

I will present our "tune-and-track" CAR T cell platform, engineered with affinity-tuned receptors for selective targeting of tumors overexpressing ICAM1. These CAR T cells also co-express SSTR2, enabling noninvasive imaging via PET/CT. This therapeutic approach has been evaluated in a Phase I clinical trial for patients with advanced thyroid cancer. In addition, I will discuss complementary strategies aimed at enhancing the safety and efficacy of CAR T for solid tumors.

### 10:35 KITv Costimulatory Domain in CAR T Cells Tuned to Solid Tumors Cell Therapy

Prasad Adusumilli, MD, FACS, FCCP, Deputy Chief and Attending, Thoracic Surgery; Vice Chair, Department of Surgery; Director, Mesothelioma Program, Memorial Sloan-Kettering Cancer Center; Associate Professor, Cardiothoracic Surgery, Weill Cornell Medical Center

In solid tumors cell therapy, our preclinical and clinical data to date show that CD28 and 4-1BB costimulatory domains in CAR T cells are insufficient to achieve cytotoxicity against heterogenous antigen expressing cancer cells. We exploited KITv costimulatory domain that functions through IFN-gamma pathway through an IL-2 independent mechanism. Mesothelin-targeted CD28 and KITv costimulated CAR T cells are effective against high, low, and non-antigen expressing cancer cells within the tumor.

### 11:05 A Streamlined Platform for Rapid Functional Discovery of Mono- and Bispecific Antibodies against GPCRs and Complex Targets

Francisco Ylera, Head, R&D New Technologies, Bio Rad Labs

Pressure to accelerate therapeutic antibody discovery and optimization continues to intensify as timelines tighten. We present

an antibody discovery platform that delivers purified antibodies in as little as 4 weeks. SpyTag-enabled modular antibody assembly technology supports rapid and versatile functional screening in various assays, including Fc effector function, internalization assessment, and bispecific antibody pair selection.

### 11:35 Session Break

### 11:40 LUNCHEON PRESENTATION: Precision CD3 Targeting: Next-Generation Functional Lead Discovery with Advanced VLP and Nanodisc Platforms

Anil Kumar, Business Development Manager, DACH Region, KACTUS

Antibody discovery against CD3 is often limited by non-native protein formats that yield non-functional binders. We present precision CD3 tools, including engineered heterodimers, TCR-CD3 VLPs, and nanodiscs, designed to better mimic native structure and signaling. These platforms improve immunization, screening, and characterization, enabling more reliable identification of functional therapeutic leads.

### 12:10 pm LUNCHEON PRESENTATION: From Droplet to Decision in Antibody Discovery: Functional Single-Cell Biology with Envisia

Paul Wylie, Vice President of Product Management, Lightcast

Binding screens are efficient, but they leave function as a late-stage question. By the time a candidate's behaviour is tested in context, significant time and resource are already committed.

Envisia, Lightcast's droplet-based single-cell functional analysis platform, applies function as a continuous lens from the earliest stages of discovery. Functional readouts at the point of screening mean richer, more predictive data at every subsequent decision point.

In this session, Paul Wylie, VP of Product at Lightcast, presents the latest Envisia data across bead-based and cell-based assay formats, alongside initial data from a plasma B-cell campaign with an early access partner in biopharma. He will also share a glimpse of the Envisia roadmap, including early indicators of the platform's potential across cell line development and cell and gene therapy workflows.

## INTERACTIVE BREAKOUT DISCUSSIONS

### 12:40 Find Your Table and Meet Your Discussion Moderator

### 12:50 Interactive Roundtable Discussions

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and

experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

#### TABLE 6: Multispecific and Logic-Gated T-Cell Engagers to Optimize Therapeutic Index

Alexander J Martinko, PhD, Senior Director, Antibody Engineering & Design, Cartography Biosciences Inc.

#### TABLE 7: Unlocking the “Dark Genome” and Leveraging AI to Modernize Therapeutics Development in Oncology, Autoimmune, and Neurodegeneration

William Fanslow III, CSO, DeepTarget Bio

#### 1:35 Chairperson's Remarks

Huan Yang, PhD, Associate Principal Scientist, Discovery Biologics, Merck & Co. Inc.

#### 1:40 Targeting of Intracellular Oncoproteins with CAR T Cells

Daniel J. Powell Jr., PhD, Professor, Pathology & Laboratory Medicine, University of Pennsylvania

This presentation will introduce peptide-centric CAR T strategies designed to recognize intracellular oncoproteins via naturally presented, unmutated peptides. Using recent findings as context, it will outline how immunopeptidome profiling and computational modelling can guide receptor design and support cross-allotype targeting. The talk will broadly discuss preclinical evidence, potential advantages for low-mutation cancers, and key considerations for advancing these approaches toward clinical translation.

### AI/ML CELL THERAPY DESIGN

#### 2:10 Artificial Intelligence Systems to Advance Engineered T Cell Immunotherapy Designs

Zinaida Good, PhD, Assistant Professor, Department of Medicine, Stanford University

Current T cell therapy discovery relies on preclinical models that poorly recapitulate patient biology and often lead to failure in clinical translation. We present tcellMIL, an attention-based multiple instance learning model that predicts patient response from single-cell data and simulates engineered cell states. Applied to CD19-CAR

T products, it improves response prediction and identifies beneficial transcriptional programs, which we validate experimentally. This framework enables clinical data-driven optimization of cellular therapies.

### OVERCOMING RESISTANCE

#### 2:40 Overcoming BCMA CAR T Resistance by Targeting MZB1

Jianzhu Chen, PhD, Professor, Biology, Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology

We have developed one-step construction of allogeneic CAR-NK cells that evade host-mediated rejection by combining selective interference of HLA-I expression, a CAR and PD-L1. CAR-NK cells overexpressing PD-L1 exhibit enhanced anti-tumor activity through upregulation of cytotoxic genes and reduced exhaustion and enhanced safety profile due to the decreased production of inflammatory cytokines involved in cytokine release syndrome. Thus, our approach represents a promising strategy in enabling “off-the-shelf” allogeneic cellular immunotherapies.

#### 3:10 How Specific Are Antibody Drugs? Revealing Insights from a New Generation of Specificity Assays

Alexander Hobby, Strategic Account Manager, Integral Molecular

Off-target binding is a significant hurdle in the development of antibody-based therapies, contributing to both drug attrition and adverse events in patients. Recent analysis from our own work identified a surprisingly high off-target rate across the industry, with up to one third of antibody drugs displaying off-target binding. In this presentation, we will discuss the emergence of cell-based protein arrays, including the membrane proteome array, as an alternative and improved technology to assess antibody specificity.

#### 3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing

### IMMUNOTHERAPIES FOR AUTOIMMUNE DISORDERS

#### 4:20 A Novel TGF-Beta/IL-2 Fusion Protein Targeting Autoimmune Diseases

Ahmet S. Vakkasoglu, PhD, Associate Director, Biologics Discovery and Innovation, Cue Biopharma

CUE-401, our lead autoimmune asset, is a novel bifunctional fusion molecule integrating a clinically validated IL-2 mutein with an attenuated TGF- $\beta$  domain to act as a master switch for Treg

differentiation and immune tolerance. It expands existing Tregs, induces new iTreg subsets, and demonstrates *in vivo* efficacy with favorable manufacturing readiness as it advances toward clinical evaluation.

#### 4:50 Dual Engagement of IL-2 and TGF- $\beta$ Receptors Promotes Treg Induction and Function to Prevent Autoimmunity

Richard J. DiPaolo, PhD, Professor and Chair, Molecular Microbiology & Immunology, Saint Louis University

This talk will present preclinical data demonstrating that CUE-401, a novel bispecific fusion protein comprising an IL-2/TGF- $\beta$  fusion protein, selectively expands, activates, and induces regulatory T cells (Tregs)—including both natural (nTregs) and induced (iTregs)—that are functionally suppressive, phenotypically stable, and effective in ameliorating disease in murine models of autoimmunity.

#### 5:20 FOXP3 Engineered CD4 T Cells for Use in Treg-Based Immunotherapy

Stella Khiew, PhD, Senior Scientist, Merck & Co.

Therapies based on enhancing the function and numbers of Tregs represent one of the most promising approaches to restore tolerance in many immune-mediated diseases. The aim of our study is to reprogram the effector T cells to become Treg-like phenotype, which has not been fully characterized. We also explored novel engineering to increase the stability of Treg reprogramming. Among several constructs tested, some show enhanced Treg-like phenotype and functional profile.

#### 5:50 The Future of Cell Therapy in Autoimmune Disease

Ricardo Grieshaber-Bouyer, Professor, Head of the Clinical Trial Unit, Clinical Systems Immunology, FAU Erlangen-Nürnberg and University Hospital Erlangen

This presentation reviews cell therapies in autoimmunity and the mechanistic basis for cell therapies in mediating deep cell depletion. I will discuss various targets, including CD19, BCMA, emerging targets, and dual-targeting strategies. Modalities such as autologous and allogeneic CAR T, CAR NK, *in vivo* CAR, and T cell engagers will be examined across different disease indications, highlighting future directions that shape the field.

#### 6:20 Networking Reception in the Exhibit Hall with Poster Viewing

#### 7:20 Close of Advances in Immunotherapy Conference



**SUNDAY, MAY 10**

2:00 pm Recommended Pre-Conference Short Course

**SC3: Challenges and Opportunities in Solid Tumor and Autoimmune Disease Therapeutics**

\*Separate registration required. See short course page for details.

**TUESDAY, MAY 12**

6:30 pm Recommended Dinner Short Course

**SC8: The Dark Proteome: Unlocking Novel Targets for Next-Generation Biologics**

\*Separate registration required. See short course page for details.

**THURSDAY, MAY 14**

7:30 am Registration Open

**7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast***Moderator: Catharine Smith, Executive Director, Termeer Foundation*

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

*Panelists:**Natalie Galant, PhD, CEO, Paradox Immunotherapeutics**Noor Jailkhani, PhD, CEO & Co-Founder, Matrisome Bio*

8:30 Transition to Sessions

8:40 Organizer's Organizer's Remarks

**IN VIVO CAR T: PRECLINICAL TO CLINICAL****8:45 Chairperson's Remarks***Adrian Bot, MD, PhD, Former CSO, Executive Vice President, R&D, Capstan Therapeutics***8:50 Immunotherapy Landscape: The *in vivo* Opportunity for Solving Industry-Wide Unmet Need***Branden A Salinas, Vice President, Process Sciences, Umoja Biopharma*

Autologous CAR T cells revolutionized treatment in 2017 with the first FDA approvals, delivering curative outcomes after a decade without new drugs. Yet, access remains limited by complex manufacturing, specialized care sites, and intensive monitoring. *In vivo* CAR T approaches aim to overcome these barriers—advancing the therapy's reach and impact. Umoja's VivoVec platform exemplifies this next wave of innovation in making CAR T therapies more accessible and scalable.

**9:20 Leveraging Targeted Lentiviral Vectors for *in vivo* CAR-Cell Generation***James I. Andorko, PhD, Director, In Vivo Discovery, Kite Pharma (formerly Interius BioTherapeutics Inc.)*

Lentiviral vectors provide a platform for *in vivo* delivery of genetic medicines and a means to simplify CAR T cell therapy. Here, we have designed an engineered delivery system to specifically target and transduce cells directly inside the body following a single intravenous injection. Preclinical mouse and non-human primate models supported advancement to a Phase 1 trial evaluating the safety of INT2104 in refractory/relapsing B-cell malignancies.

**9:50 Development of Novel Chimeric Antigen Receptor (CAR) Products; Historical Perspective and Future Oncology Applications***John Rossi, PhD, SVP, Stealth Co. Former Vice President, Translational Medicine, Capstan Therapeutics*

This presentation will explore the evolution of CAR based therapies from early *ex vivo* engineered approaches to emerging *in vivo* immune cell engineering strategies. It will reflect on development timelines, key lessons learned, and the scientific and translatory insights that have shaped the field to date. The session will also consider how novel *in vivo* platforms may expand future oncology applications, including opportunities and challenges in pursuing solid tumor settings.

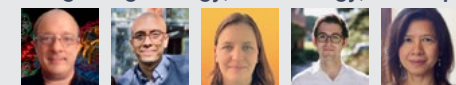
10:20 Sponsored Presentation (*Opportunity Available*)**10:35 Hybrid Adjuvant-LNP mRNA Vaccines Elicit Robust CD8+ T Cells against Neoantigen Tumors and Suppress Tumor Growth***Syed Reza, Scientific & Sales Consultant, NOF AMERICA CORPORATION*

Effective mRNA cancer vaccines require lipid nanoparticles (LNPs) that balance cytoplasmic mRNA delivery with immune stimulation. We present a hybrid LNP platform, LNP(OP/EC), that combines two distinct ionizable lipids: COATSOME® SS-OP, for high transfection efficiency, and COATSOME® SS-EC, containing a Vitamin E scaffold for potent adjuvant effects. This hybrid LNP demonstrated specific cellular immunity against neoantigen tumors while minimizing general inflammatory responses.

10:50 Coffee Break in the Exhibit Hall with Poster Viewing

**ENTREPRENEUR MEET-UP****Fostering Entrepreneurship and Models for Start-Ups***Natalie Galant, PhD, CEO, Paradox Immunotherapeutics**Catharine Smith, Executive Director, Termeer Foundation*

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

**PLENARY FIRESIDE CHAT****11:35 Plenary Fireside Chat Introduction***Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.***11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience***Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation*



The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

Panelists:

Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

Rebecca Croasdale-Wood, PhD, Senior Director, Augmented Biologics Discovery & Design, Biologics Engineering, Oncology, AstraZeneca

Joshua Meier, Co-Founder & CEO, Chai Discovery

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi

**12:35 pm Networking Luncheon in the Exhibit Hall and Last Chance for Poster Viewing**

## IN VIVO CAR T: PRECLINICAL TO CLINICAL

### 2:05 Chairperson's Remarks

Adrian Bot, MD, PhD, Former CSO, Executive Vice President, R&D, Capstan Therapeutics

### 2:10 FEATURED PRESENTATION: Toward the Democratization of CAR T Cell Therapies for Cancer

Kevin M. Friedman, PhD, CEO, Kelonia Therapeutics Inc.

Kelonia's iGPS platform is redefining the CAR T cell landscape by shifting from complex, costly *ex vivo* manufacturing to *in vivo* gene delivery that enables CAR T cell generation directly inside the patient. Preclinical data suggests that by harnessing iGPS technology Kelonia's lead program, KLN-1010, could potentially maintain or even improve the transformative clinical responses that have made CAR T cell therapy a breakthrough for patients suffering from multiple myeloma.

### 2:40 Transforming Immunotherapy through Multi-Immune Cell Programming *in Vivo*

Robert J. Hofmeister, PhD, CSO, CREATE Medicines

CREATE Medicines develops mRNA-based immunotherapies to directly program immune cells *in vivo*, thereby eliminating complex

*ex vivo* manufacturing and reduced time to treatment. Cell-specific CAR mRNA products delivered through lipid nanoparticles enable us to launch a multi-immune cell attack on cancer or autoreactive cells. Preclinical studies in mice and non-human primates highlight the potential of a multi-pronged *in vivo* cell therapy to drive stronger and longer-lasting outcomes for patients.

### 3:10 PANEL DISCUSSION: Learnings from Current *in vivo* CAR T Programs

Moderator: Adrian Bot, MD, PhD, Former CSO, Executive Vice President, R&D, Capstan Therapeutics

Panelists:

James I. Andorko, PhD, Director, In Vivo Discovery, Kite Pharma (formerly Interius BioTherapeutics Inc.)

Kevin M. Friedman, PhD, CEO, Kelonia Therapeutics Inc.

Robert J. Hofmeister, PhD, CSO, CREATE Medicines

Branden A Salinas, Vice President, Process Sciences, Umoja Biopharma

### 4:10 Networking Refreshment Break

## LIPID NANOPARTICLES FOR *IN VIVO* CAR T

### 4:40 Latest Developments in LNP Delivery for *in vivo* Engineering

Hamideh Parhiz, PharmD, PhD, Assistant Professor, Department of Pharmacology, University of Pennsylvania

Targeted delivery of RNA-based therapeutics for *in vivo* cellular reprogramming holds significant potential. In this talk, I will explain how we can selectively target mRNA therapeutics to specific cells and cell subtypes using antibody-modified lipid nanoparticles. Additionally, I will discuss the recent potential applications we've explored with this platform technology.

### 5:10 The Development of a Lipid Nanoparticle Platform for *in vivo* CAR T

Andrew J. Sawyer, PhD, Distinguished Scientist & Oncology Project Lead, Immune Cell Reprogramming, Sanofi Group

CAR T cell therapy has set a new benchmark in patients with certain hematologic malignancies, but significant barriers to patient access remain. In this talk we will present the design and characterization of an LNP system designed to reprogram T cells *in vivo*. This system can specifically transfect T cells with an active CAR *in vitro* and *in vivo* and has the potential to revolutionize patient access to cell therapies.

### 5:40 Extra-Hepatic Delivery of Nucleic Acids via LNPs

Jagesh V. Shah, PhD, Senior Vice President, Head of Platform, Mirai Bio

Extrahepatic targeting for genetics medicines remains a key challenge. Mirai Bio has built an open platform driven by machine intelligence and *in vivo* barcoding to develop next-generation ionizable lipids and formulations. These base LNPs can be tuned for high on-target delivery to chosen cell types and favorable off-target selectivity, specifically reduced liver delivery. Further increases in potency and selectivity are seen through the addition of targeting moieties to the surface.

### 6:10 Close of Day

## FRIDAY, MAY 15

### 7:15 am Registration Open

## INTERACTIVE ROUNDTABLE DISCUSSIONS

### 7:30 Interactive Roundtable Discussions with Continental Breakfast

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

### TABLE 4: *In Vivo* CAR T Therapy - Advances in Targeting and Payload Engineering

Shimobi Onuoha, PhD, CTO, Chimeris UK Ltd.

## BEYOND FIRST-GENERATION *IN VIVO* CAR T

### 8:25 Chairperson's Remarks

Sara M. Mangsbo, PhD, Professor, Pharmacy, Uppsala University

### 8:30 T Cell Targeted Vectors for *in vivo* CAR Delivery

Christian J. Buchholz, PhD, Professor & Head, Molecular Biotechnology & Gene Therapy, Paul Ehrlich Institut

Highly effective, yet complex to manufacture, simplifying CAR T cell generation is at the forefront of current research. The recent progress in generating CAR T cells directly in the patient relies



heavily on vector technology, particularly high selectivity for T lymphocytes. This presentation will discuss different vector platforms focusing especially on engineering strategies for lentiviral vectors, AAV vectors and lipid nanoparticles displaying DARPs recognizing T cell marker as entry receptor.

### 9:00 In vivo Site-Specific of Large DNA Payload to Reprogram T Cells

*Justin Eyquem, PhD, Associate Professor, Department of Medicine, University of California San Francisco*

Here we demonstrate that stable and cell-specific transgene expression can be achieved through *in vivo* site-specific integration of large DNA payloads. We developed a two-vector system to deliver CRISPR-Cas9 and DNA template. We optimized both vectors for specificity of delivery to T cells and knock-in efficiency. By integrating a CAR transgene into a T cell-specific locus we generated *in vivo* therapeutic levels of CAR-T cells in hematological and solid malignancies.

### 9:30 Streamlined Fusion Protein Surface Decorated LNP for Specific Drug Delivery of mRNA Therapeutics

*Sara M. Mangsbo, PhD, Professor, Pharmacy, Uppsala University*

Targeted delivery of lipid nanoparticles (LNPs) using protein-based strategies can expand the clinical use of RNA therapeutics. While antibody conjugation is promising, scalable production remains challenging. We designed a synthetic peptide tag-lipid integration and an ApoE2-tag design enabling subsequent rapid antibody dressing of LNPs. This approach preserves particle integrity during storage and supports scalable production, offering a viable path for precision delivery in RNA-based treatments.

### 10:00 Engineering Armoured *in vivo* CAR T Cells Through Targeted Delivery and Transient mRNA Gating

*Shimobi Onuoha, PhD, CTO, Chimeris UK Ltd.*

In-vivo CAR-T generation using mRNA-loaded lipid nanoparticles offers a scalable alternative to ex-vivo cell therapies but is constrained by transient expression, limited potency, and safety concerns. We describe a CD8-targeted, T-Cell-restricted mRNA-LNP platform that leverages AI-engineered binding domains for both LNP decoration and CAR antigen recognition, enabling titratable, localized cytokine armoring. Preclinical data demonstrate improved specificity, extended functional persistence, and compatibility with reduced frequency redosing in murine and NHP models.

### 10:30 Networking Coffee Break

## NEXT-GENERATION IMMUNOTHERAPIES

### 10:45 Therapeutic mRNA Cancer Vaccine by CATP

*Yingzhong Li, PhD, President, SunVax mRNA Therapeutics*

Achieving sufficient therapeutic payload delivery remains a significant challenge in gene therapy. To address this, we co-deliver self-amplifying mRNA (SamRNA) encoding therapeutic payloads and modified mRNA encoding alphavirus capsids and envelopes (CATP), initiating two waves of amplifications of therapeutic payloads by SamRNA and defective viral particles infection of neighboring cells for secondary payload amplification. The CATP represents a transformative approach to gene therapy and a potent platform for cancer immunotherapy.

### 11:15 Non-Viral Gene-Editing Approaches for Next-Generation CAR T Cell Therapies: Harnessing C4DNA-Mediated Genomic Integration

*Hao Howard Wu, PhD, Co-Founder & CSO, Full Circles Therapeutics*

At Full Circles, we developed C4DNA, a non-viral genome-writing platform generating programmable mini-circular single-stranded DNAs (up to 20 kb) for precise, efficient transgene integration. C4DNA achieves up to 70% knock-in efficiency in iPSCs and primary immune cells using diverse editors. In CAR T and NK cells, it offers high precision, safety, and scalability, addressing key AAV and dsDNA limitations and enabling next-generation non-viral immune cell therapies for cancer and autoimmune diseases.

### 11:45 Drug-Regulated Synthetic Cytokine Receptors for Controlled *in vivo* Expansion of Cell Therapies

*Louai Labanieh, PhD, Assistant Professor, Department of Immunology and Immunotherapy, Icahn School of Medicine at Mount Sinai*

Delivering cytokine signals to engineered T cells expands them to therapeutic levels, but systemic cytokines or constitutive signaling cause toxicities. Tools for safely expanding CAR-T cells using small molecule-inducible systems are lacking. We developed modular synthetic cytokine receptor platforms delivering cytokine signals (gamma chain cytokines and others) via an FDA-approved small molecule. CAR-T cells expressing these receptors demonstrate enhanced expansion, persistence, and anti-tumor efficacy in difficult-to-treat tumor models *in vivo*.

### 12:15 pm Close of Summit

# EXPRESSION STREAM

Enhancing Efficiency, Quality, and  
Cost-Effectiveness

Recombinant protein expression is time-consuming, technically challenging, and underappreciated. Yet its impact is foundational for biological research and biopharmaceutical development. The PEGS Boston Summit Expression Stream explores strategies to overcome expression, production, and purification challenges, compare host systems, implement automation, and refine scalable workflows.



EXPRESSION  
STREAM  
CONFERENCES

MAY 11-12

## Difficult-to-Express Proteins

AGENDA

MAY 12-13

## Optimizing Protein Expression

AGENDA

MAY 14-15

## Maximizing Protein Production Workflows

AGENDA

## SUNDAY, MAY 10

## 2:00 pm Recommended Pre-Conference Short Course

SC1: *In silico* and Machine Learning Tools for Antibody Design and Developability Predictions

\*Separate registration required. See short course page for details.

## MONDAY, MAY 11

## 7:00 am Registration and Morning Coffee

## 8:20 Organizer's Opening Remarks

Mary Ann Brown, Executive Director, Conferences, Cambridge Healthtech Institute

## INTEGRATED STRATEGIES FOR CHALLENGING PROTEIN EXPRESSION

## 8:25 Chairperson's Remarks

Felix Findeisen, PhD, Principal Scientist II, Protein Therapeutics, Gilead Sciences

8:30 *De novo* Design of Therapeutic Grade Antibodies against Challenging Integral Membrane Targets

Connor Blankenship, PhD, Senior Scientist, Nabra Bio Inc.

We present a *de novo* antibody design platform that generates high-affinity, drug-like leads against traditionally challenging targets including GPCRs, transporters, and pMHCs. Our approach leverages high hit rates to enable direct screening in a native cellular context, allowing us to address proteins that are difficult to recombinantly express and purify.

## 9:00 Design of Intrinsically Disordered Region Binding Proteins

Kejia Wu, PhD, Protein Design Lab, University of Washington

Intrinsically disordered proteins (IDPs) and regions (IDRs) control key "undruggable" processes in transcription, phase separation, and aggregation. I will describe a deep-learning-driven design framework that treats IDRs as programmable targets, generating *de novo* binders and proteases to disordered sequences and PTM-defined epitopes with high affinity and specificity. These designer proteins enable targeted inhibition, relocalization, or cleavage of disease-relevant IDRs in cell receptors, oncogene, neurodegenerative-relevant proteins, and viral oncogenic proteins.

## 9:30 Optimizing Baculovirus Expression Vector Systems for Difficult Recombinant Protein Targets

Carissa Grose, Co-Director, Protein Expression Laboratory, Cancer

Research Technology Program, Leidos Biomedical Research Inc

We have been working to improve BEVS by experimenting with different insertion sites in the baculovirus genome and testing alternative baculovirus promoters to improve quality and yield for more complex target proteins. We have also demonstrated significant improvement in stability of the gene of interest over multiple passages.

## 10:00 Overcoming Barriers in Expressing Challenging Proteins with Advanced Expression Systems

Jonathan Zmuda, Senior Director, R&amp;D, Protein &amp; Viral Vector Expression Systems, Thermo Fisher Scientific Inc.

Philipp Cyprys, Thermo Fisher Scientific

Efficient expression of complex protein formats, including bispecific, multispecific, and non-antibody proteins remains a bottleneck in early discovery. We describe a high-throughput transient workflow using the Gibco Expi293 PRO Expression System to enable high yield and reproducible production across diverse protein classes. Expression performance is evaluated alongside key developability assessments, demonstrating how early biophysical characterization supports candidate selection, reduces downstream risk, and accelerates progression from screening to scalable production.

## 10:30 Networking Coffee Break

## 11:00 Innovations in Cell-Free Protein Synthesis for Therapeutic Development

Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University

Cell-free protein synthesis (CFPS) is emerging as a transformative platform for recombinant therapeutic production. Here, we present advances in bacterial CFPS systems that improve yield, scalability, and product quality while accommodating complex modalities, including post-translational modifications like glycosylation. These innovations position CFPS to accelerate therapeutic discovery, streamline development, and enable flexible, distributed biomanufacturing for next-generation biologics.

## 11:30 Effect of Different Cell Culture Media on the Production and Glycosylation of a Monoclonal Antibody from a CHO Cell Line

Jaeweon Lee, Graduate Student, Chemical Engineering, University of Massachusetts Lowell

Three chemically defined media for CHO-K1 production of the VRC01 mAb were compared in this study regarding growth, titer,

and N-glycosylation. ActiCHO P achieved high productivity and the most consistent glycan profiles, closely matching ActiPro, whereas EX-CELL 325 showed lower performance. Because media changes can alter critical quality attributes, comparability is essential. Results indicate ActiCHO P is a reliable alternative medium without compromising product quality.

## 12:00 pm Session Break

12:10 LUNCHEON PRESENTATION: Streamlining Discovery and Development Workflows Using Engineered *P. fluorescens* Strains for ncAA Incorporation and Extracellular Protein Production

Diane Retallack, President &amp; COO, Primrose Bio

Streamlined product discovery and development workflows are critical to facilitate efficient decision making and candidate advancement. Improvements in extracellular (EC) localization and ncAA incorporation within the Pfenex platform can accelerate discovery and development timelines. Engineered host strains show EC production of a wide range of proteins, enabling streamlined recovery and analysis. Further, high fidelity, high titer production of target proteins with 100% ncAA incorporation has been established, with titers up to 15g/L in fermentation.

## 12:40 Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own

## 1:10 Session Break

## ADVANCING DTEP WORKFLOWS FOR DISCOVERY

## 1:15 Chairperson's Remarks

Timothy K. Craig, PhD, Associate Research Fellow, Pfizer Inc.

## 1:20 Establishing GPCR Production Workflows to Support Large- and Small-Molecule Discovery Programs

Felix Findeisen, PhD, Principal Scientist II, Protein Therapeutics, Gilead Sciences

Production of a wide variety of clinically relevant G-protein coupled receptors at quantities sufficient for a variety of downstream applications is challenging. Therefore, we established and improved screening methods to evaluate membrane protein construct expression and solubilization. Furthermore, we show translatability of production from milliliter to 10-liter scale. Using several examples, we show how our purification workflow can produce GPCRs, including for immunization, structural biology, and



biophysical characterization.

### 1:50 Engineered Scaffolds for Soluble GPCR Expression

Alexander Taguchi, PhD, Director of Machine Learning, iBio Inc.

GPCR targets are recombinantly expressed in soluble form using machine learning–designed engineered scaffolds. These engineered GPCR surrogates express well, support post-translational modifications by production in human cells, bind specifically to their native ligands, and are structurally validated using experimental methods. This strategy enables high-yield, soluble expression of previously intractable GPCRs in a functionally and structurally validated format to support drug discovery efforts.

### 2:20 GPCR Production Supporting DNA Encoded Library Screening

Timothy K. Craig, PhD, Associate Research Fellow, Pfizer Inc.

GPCRs are a class of highly druggable targets that are difficult to access in recombinant systems in amounts and quality sufficient for binding-first methods, including DNA Encoded Library (DEL) screening for hit finding and then also for follow-up of hits. In this talk, I will review some of our successful strategies and tactics for accessing these targets using membrane mimetics including SMALPs and other detergent-free formulations.

### 2:50 Engineering Expression Systems for Both Yield and Glycan Control

Lars Stoeckl, Managing Director, FyoniBio GmbH

Some biologics resist expression. Others express—but with the undesired glycosylation. Solving both simultaneously is one of the most persistent challenges in biopharmaceutical development. In this talk, we present an integrated strategy combining engineered CHO and human host cell lines, process optimization, and targeted analytics to address both challenges in parallel. By applying tailored platforms such as CHOnamite® and GlycoExpress®, expression and glycan profiles can be adjusted in a controlled and complementary way. We highlight how this approach enables expression of difficult molecules while maintaining control over glycosylation, ultimately supporting more reliable and scalable development pathways.

### 3:05 Unlocking Difficult-to-Express Proteins through Dynamic Optogenetic Control

Kiana Mohajeri-Stickels, Head of Synthetic Biology, Prolific Machines

Prolific Machines' photomolecular platform uses molecular optogenetics to dynamically control gene expression in mammalian cell lines using light. The unique features of Prolific's platform enable a range of solutions for the production of next-generation complex biologics while leveraging proven mammalian production architecture. This presentation will cover how Prolific platform

works and highlight key advantages we enable for cell line development efficiency and resultant titer and quality. We'll include how these benefits are realized across application cases including the production of difficult-to-express molecules, mAbs with PTM considerations, and stoichiometry-sensitive multispecifics.

### 3:20 Networking Coffee & Refreshment Break

### 4:05 Transition to Plenary Keynote Session

## PLENARY KEYNOTE



### 4:15 Plenary Keynote Introduction

G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company



### 4:25 CARs 2026: New Models and New Runways

Michel Sadelain, MD, PhD, Director, Columbia University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center

T cell engineering holds great promise for the treatment of cancers and other pathologies. The original chimeric antigen receptor (CAR) prototypes targeting CD19 are now giving way to further refined receptors endowed with greater sensitivity and combinatorial possibilities. Emerging new targets and engineering tools augur favorably for broadening the use of CAR therapies.

## YOUNG SCIENTIST KEYNOTE



### 5:10 Deep Learning-Based Binder Design to Probe Biology

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Protein-protein interactions are central to biology and drug discovery, yet traditional antibody generation is slow and costly. BindCraft is an open-source, automated computational pipeline for *de novo* protein binder design that routinely yields nanomolar binders with 10-100% experimental success, without high-throughput screening or maturation. We illustrate applications to peptides, cell-surface receptors, allergens, and gene editors, and outline how deep-learning workflows can accelerate next-generation therapeutics, diagnostics, and bioprocessing.ion in the Exhibit Hall with Poster Viewing

## YOUNG SCIENTIST MEET-UP

### Young Scientist Meet-Up

Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University

Gian Marco Visani, PhD Graduate Student, University of Washington

Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology

This young scientist meet-up is an opportunity to get to know and network with mentors of the PEGS community. This session aims to inspire the next generation of young scientists by giving direct access to established leaders in the field.

- Get to know fellow peers and colleagues
- Make connections and network with other institutions
- Discuss the role of mentors and peers role models in the field

### 7:15 Close of Day

## TUESDAY, MAY 12

### 7:45 am Registration and Morning Coffee

## INNOVATION AT THE INTERFACE FOR COMPLEX PROTEIN PRODUCTION

### 8:30 Chairperson's Remarks

Deborah Moore-Lai, PhD, Vice President, Protein Sciences, ProFound Therapeutics

### 8:35 Design-Driven Optimization of Low-Cost High-Yielding Cell-Free Protein Synthesis

Ashty S. Karim, PhD, Assistant Professor, Chemical & Biological Engineering, Northwestern University

Access to recombinant proteins is vital for biotechnology. Cell-free protein synthesis systems could address this need, but widespread utilization remains limited by cost and complexity. To address these limitations, we discovered a simple and reproducible system that can produce up to  $3.7 \pm 0.2$  g/L at a ~99% reduction in cost. We anticipate that our work will further democratize the use of cell-free systems for protein manufacturing and biotechnology.

### 9:05 FEATURED PANEL DISCUSSION: Convergence in Protein Science: The New Interface Where Computational Creativity, Experimental Rigor, and

**Hybrid Talent Meet**

Moderator: Deborah Moore-Lai, PhD, Vice President, Protein Sciences, ProFound Therapeutics

ML/AI is generating unprecedented designer proteins, but their value depends on experimental confirmation. This panel explores how *in silico* models integrate with mammalian, yeast, *E. coli*, and cell-free expression systems, supported by display technologies for functional validation. Experts discuss strategies to assess expressibility, folding, and scalability, and how unified digital-wet lab workflows accelerate multi-modality therapeutic development.

Panelists:

James Bowman, PhD, CTO, AI Proteins

Ashty S. Karim, PhD, Assistant Professor, Chemical & Biological Engineering, Northwestern University

Carter A. Mitchell, PhD, CSO, Purification & Expression, Kemp Proteins, LLC

**10:05 Building Better Biologics: An End-to-End Synthetic Biology Ecosystem for Therapeutic Development**


Gavin Barnard, Chief Scientific Officer, ATUM

The rapid evolution of complex biologics modalities has outpaced traditional cell line development (CLD) workflows, which struggle with the complexities of multi-chain assembly and the inherent “developability” hurdles of non-natural scaffolds. To address these challenges, we present an integrated information-driven discovery-to-production ecosystem that leverages Machine Learning, high-titer transient expression, and stable genomic integration to streamline the development of complex biologics.

**10:35 Coffee Break in the Exhibit Hall with Poster Viewing**
**11:15 From Strain to Purification: A Systems Engineering Approach to Streamlined Nanobody Production**

Romel Menacho-Melgar, PhD, CSO, Roke Biotechnologies

We present a systems engineering framework for microbial protein production that enables plug-and-play integration of advanced tools to unlock new manufacturing capabilities. By combining scalable two-stage expression, redox reprogramming for efficient disulfide bond formation, and cell-programmed downstream processing, we establish a unified platform for nanobody production.

**11:45 Facile Antibody Conjugate Production by Interfacing Protein Engineering with Metabolic Glycoengineering**

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical

& Biomolecular Engineering, Johns Hopkins University

Antibodies have broad utility in imaging, targeted gene delivery, and disease therapy, and many of these applications require conjugation to secondary molecules. Unfortunately, conventional conjugation approaches are limited by destabilization of structure, heterogeneity, and technically demanding multi-step reactions. To overcome these challenges, we developed a straightforward and highly general platform for site-specific antibody conjugation that blends metabolic glycoengineering with protein design, presenting a highly efficient strategy to produce antibody conjugates.

**12:15 pm Speed Without Compromise: Tailored CHO.RIGHT Cell Line Development for Any Antibody Format**


Anneliese Krueger, Scientist, Pharmaceutical Cell Line Development, ProBioGen AG

ProBioGen established a fully optimized workflow that enables the rapid development of stable, high-yielding CHO cell lines, even for structurally complex antibodies. The DirectedLuck transposase ensures a stable and robust clone pool expression. This is achieved by advanced epigenetic targeting to the most active genomic sites. Complementary to this highly efficient gene delivery, our flexible, automated clone screening robotic system PSi.Bot and early high-throughput product analytics enable real-time decision-making and the early identification of high-performing clones. This combined approach sets new benchmarks for speed, scalability, and reliability in therapeutic protein development. It demonstrates that even the most complex biologics can be efficiently produced when all elements of cell line development are optimally aligned and finely tuned.

**12:30 Antibodies and Their Targets: If You Can't Express It, Design It**


Adi Goldenzweig, Co-Founder & CTO, Scala Biodesign

Robust protein expression in cost-effective systems remains a key constraint in biologics discovery and development. This challenge is increasingly acute as targets become less tractable and therapeutic modalities more complex - particularly for multi-domain modalities, where marginally stable as individual components often fail in their full formats.

I will present ScalaOS, a computational design platform that integrates AI with physics-based modeling to design proteins for improved expression, stability, and manufacturability across host systems without compromising activity. I will share lab-validated case studies on difficult-to-express targets and antibody-based modalities, demonstrating how design-driven approaches can unlock screening, structural characterization, and downstream

development for otherwise intractable molecules.

**12:45 Session Break**
**12:50 LUNCHEON PRESENTATION: GenScript x Sanofi: Enabling Faster Biologics Research: High-Throughput, Automated Protein Production at Scale**


Weijun Ma, Senior Scientist, Biologics, Sanofi Group  
Luciana Rosselli, Field Application Scientist, GenScript USA Inc

**1:20 LUNCHEON PRESENTATION: Corynex Secretory Manufacturing for VHHs and Peptides: Extending Half-Life with PASylation**


Yumi Nagase, Lead Researcher, BioPharma Solutions, Ajinomoto Co. Inc.  
Uli Binder, Managing Director, XL-protein GmbH

Corynex is Ajinomoto's gram-positive bacterial platform and CDMO service for biologics. This presentation highlights our capabilities and case studies for production of long-chain peptides and VHHs. To address the short half-life often associated with low-molecular-weight proteins, we combine Corynex with XL-protein's PASylation technology to create half-life-extended biopharmaceuticals, achieving high titers with high purity through an endotoxin-free host and a secretion-based process.

**1:50 Close of Difficult-to-Express Proteins Conference**
**6:30 Recommended Dinner Short Course**
**SC9: Automation in Action: Hands-on, Liquid Handling for Protein & Antibody Engineering**

\*Separate registration required. See short course page for details.



## SUNDAY, MAY 10

## 2:00 pm Recommended Pre-Conference Short Course

**SC1: In silico and Machine Learning Tools for Antibody Design and Developability Predictions**

\*Separate registration required. See short course page for details.

## TUESDAY, MAY 12

## 1:50 pm Networking Coffee &amp; Dessert Break in the Exhibit Hall with Poster Viewing

## 2:20 Organizer's Opening Remarks

Mary Ann Brown, Executive Director, Conferences, Cambridge Healthtech Institute

**BALANCING PROTEIN DESIGN WITH EXPRESSION BIOLOGY**

## 2:25 Chairperson's Remarks

Richard Altman, MS, Field Application Scientist, Thomson Instrument Company

**2:30 Featured Presentation: What Does a Protein Need for Efficient Protein Secretion?**

Nathan E. Lewis, PhD, GRA Eminent Scholar and Professor, Center for Molecular Medicine Complex, Department of Biochemistry and Molecular Biology, University of Georgia

The protein secretion pathway is a gatekeeper for biotherapeutic manufacturing, but many recombinant targets remain hard to express. We studied the production of 2,135 proteins human secreted proteins in CHO cells to identify which features (mRNA abundance, RNA/protein structure, and host cell gene expression) correlated with productivity. From this we developed an experimental/computational pipeline for deciphering how the host cell supports each unique protein invaluable for CHO cell-line development.

**3:00 GROQ-seq: A Massively Collaborative Approach to Addressing Protein Function Prediction**

Aviv Spinner, PhD, Research Fellow, Protein Machine Learning, Align Foundation

The Align Foundation, in partnership with NIST, has built a publicly available platform to advance protein sequence-to-function prediction. We are generating standardized functional data

for hundreds of thousands of protein variants across diverse functions using our scalable, growth-based quantitative sequencing platform (GROQ-seq). With seven functions onboarded and multiple academic and facility partners, this growing resource is a coordinated field-wide effort to improve functional prediction models and benchmark library design strategies.

**3:30 PUREfrefx: The Rebuilt Protein Factory**

Takashi Ebihara, COO, GeneFrontier Corporation

PUREfrefx is a rebuilt cell-free protein expression system that transforms how proteins are produced and explored. Its modular design enables precise molecular control and broad adaptability— from expressing challenging biologics to supporting high-throughput workflows. PUREfrefx serves as a flexible foundation for therapeutic protein development, synthetic biology, and ML/AI-driven innovation.

**3:45 CleanCut GS ADCC+: Afucosylated mAbs at 6 g/L from a Double GS Knockout CHO Platform**

Corey Brizzee, Director, Gene Editing, Demeetra

CleanCut CHO cell lines are built using Cas-CLOVER for high-fidelity knockouts and safe harbor integrations. Here we present data from CleanCut GS ADCC+, engineered with a double GS and bi-allelic FUT8 knockout to enable afucosylated antibody production at titers up to 6 g/L. Demeetra's partnership with NorthX Biologics extends the value of the CleanCut Platform from cell line development through GMP manufacturing. Biopharma companies can now use CleanCut in their own internal workflows or access a seamless CLD-to-GMP path through a single integrated approach.

**4:00 Refreshment Break in the Exhibit Hall with Poster Viewing****4:10 Speed Networking**

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

**SPEED NETWORKING****Speed Networking: How Many New Contacts Can You Make?**

Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

**4:40 Redefining Transient Gene Expression: A Preculture-Free Transfection Platform for CHO Cells**

Paco Pino, Director, R&amp;D, ExcellGene SA

This presentation will provide an opportunity for our R&D team to unveil, for the first time, the results of many years of research focused on the development and validation of a new, optimized, and simplified process for the expression of a wide range of molecules in activated CHO cells, across different scales.

**5:10 PANEL DISCUSSION: The Recombinant Protein Pie Chart**

Moderator: Richard Altman, MS, Field Application Scientist, Thomson Instrument Company

This panel explores how the landscape of recombinant proteins expressed has evolved over the past five years. The panel discusses and compares the classes of proteins more frequently produced then, such as traditional mAbs and receptors, and now, such as multispecific biologics and membrane proteins, and how they affect the acceleration of therapeutic innovation.

Panelists:

Ethan Dunn, Associate Principal Scientist, Discovery Biologics, Merck

Brian E. Hall, PhD, Distinguished Scientist, Large Molecule Research, Sanofi

Edward Kraft, PhD, Senior Director, Small Molecule Discovery, Leash Bio

Jessica Williamson, PhD, Head, US Protein Sciences, UCB

**6:10 Close of Day****6:30 Recommended Dinner Short Course****SC9: Automation in Action: Hands-on, Liquid Handling for Protein & Antibody Engineering**

\*Separate registration required. See short course page for details.

## WEDNESDAY, MAY 13

## 8:00 am Registration Open



## PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL

### 8:25 Chairperson's Remarks

### 8:30 Innovation in Protein Science with Young- Scientist Visionaries



Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.

#### Panelists:

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School

Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder

Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School

### 9:15 Coffee Break in the Exhibit Hall with Poster Viewing

## MENTORING MEET-UP

### Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship

Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

## SELECTING, ENGINEERING, AND OPTIMIZING EXPRESSION PLATFORMS

### 10:00 Chairperson's Remarks

Aviv Spinner, PhD, Research Fellow, Protein Machine Learning, Align Foundation

### 10:05 TniET: A Novel Baculovirus Titering Cell Line

Matthew R. Drew, Eukaryotic Protein Expression Lead, Protein Expression Lab, Frederick National Lab for Cancer Research

Titering of baculovirus stocks is a vital and necessary step in good protein production, though it is often subjective and/or time consuming and tedious. This newly developed cell line, aims to address the issues many of the current day titering techniques and offer a rapid, accurate method for obtaining viral stock titers.

### 10:35 Bridging AI Design and Rapid Experimental Validation: Optimizing Cell-Free Expression for Machine Learning Workflows

Adam Carr, Associate Director, Cell Free Production, BigHat Biosciences

BigHat Bioscience's platform couples AI design with a wet lab that enables rapid screening of thousands of antibodies per week. Powered by cell-free protein synthesis, our platform enables optimization of multiple antibody properties including affinity, function, and developability. We'll share key developments of our CFPS system which enable robust antibody characterization of *in silico* designs. We'll also highlight how our platform has optimized increasingly complex challenges for next-generation antibody therapeutics.

### 11:05 Talk Title to be Announced

Raja Srinivas, Founder, Asimov

### 11:35 Session Break

### 11:40 LUNCHEON PRESENTATION: TurboCHO Protein Expression Kit: A New Standard for Rapid, Consistent, and High-Yield CHO Expression



Hanying Luo, Director of Protein & Antibody Solutions, Global Product Management, GenScript USA Inc.

### 12:10 pm LUNCHEON PRESENTATION: Tips and Tricks in Speeding up Transient HEK293 and Transient/Stable CHO from 96 well, 24 well, 6 well, 125mL-7L Optimum Growth Flasks



Sam Ellis, CEO, Thomson Instrument Company

The conditions for Plasmids, Transient HEK293 and Transient/Stable CHO from 96 well, 24 well, 6 well, 125mL-7L Optimum Growth flasks need to be maintained at small scale. Data will be presented on techniques and technology that allow for getting high amounts of protein in smaller volumes with fast techniques from 1mL-3L. This allows teams to get to IND molecules quickly. All of these techniques are proven technologies for protein production, structural biology, and can lead to successful clinical candidates.

## INTERACTIVE BREAKOUT DISCUSSIONS

### 12:40 Find Your Table and Meet Your Discussion Moderator

### 12:50 Interactive Roundtable Discussions

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

### TABLE 8: Protein Production in Discovery: Current Landscape and a Roadmap for the Future

Anand Narayanan, PhD, Senior Scientist, Biologics Discovery, Johnson & Johnson

- Transient or Stable Pool or Both? Smart choices for rapid discovery process
- High throughput Protein Production: Integrating digital pipelines with lab automation
- Leveraging AI to accelerate and improve the efficiency of protein production

## ENHANCING BIOTHERAPEUTIC EXPRESSION & PRODUCTION

### 1:35 Chairperson's Remarks

*Ayla Sessions, Associate Director, AstraZeneca*

### 1:40 Combining UCB's Internal Antibody Expertise with External Innovations to Enhance CHO Cell Production

*Mark Ellis, Senior Principal Scientist, UCB Pharma*

The presentation explores the end-to-end process of therapeutic antibody discovery and development, highlighting challenges across key stages. How internal and external innovations have driven antibody discovery, expression and development. From candidate selection, antibody humanisation, expression systems, cell line engineering and microfluidic cell sorting. Together, these technologies have provided critical advancements to antibody-based therapeutics.

### 2:10 Automating Mid-Scale Antibody Production: Bridging the Gap in Discovery Workflows with Novel Liquid Handling and Filtration Technologies

*Ayla Sessions, Associate Director, AstraZeneca*

Novel labware, integrated automation, and optimized workflows now enable efficient, high-throughput production and purification of antibodies at multi-milligram scales. Recent advances remove long-standing bottlenecks in harvesting and purifying harder to express antibody formats from mid-scale cultures, supporting seamless, end-to-end automation. These innovations accelerate discovery and development pipelines, advancing the automated manufacture of complex biologics previously limited by labor-intensive manual processes.

### 2:40 Scalable Production of Soluble Complex Multi-Pass Membrane Proteins for Supporting Antibody Discovery

*Sheng Yang, PhD, Senior Scientist II, Biologics Discovery, Johnson & Johnson*

Complex multi-pass membrane proteins such as GPCRs are valuable therapeutic targets but difficult to express because hydrophobic transmembrane regions cause misfolding, aggregation, and low yields. We present a robust, reproducible nanodisc-based workflow that reliably generates milligram quantities of soluble, properly folded proteins in a single cycle. The resulting nanodiscs preserve native epitopes and ligand binding, and the process is broadly applicable across multi-pass targets in mammalian or insect expression systems.

### 3:10 Optimizing Functional GPCR Expression via Automated Cell-Free Synthesis and Multiplexed Nanodisc Screening

*Kundan Sharma, Key Account Manager (UK) in BD & Sales, Nuclera*

Producing active GPCRs is a bottleneck due to harsh detergent extractions. The eProtein Discovery™ system solves this by co-translating GPCRs directly into nanodiscs via cell-free synthesis. We launch our GPCR nanodisc panel reagents, which the system uses to multiplex 11 constructs against 8 tailored lipid/additive conditions in 24h. Validated by  $\beta$ 1AR and FFAR1 case studies, this screen-to-scale workflow tripled the active fraction (>45%) and delivered structure-ready protein in 48h.

### 3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing

## ALIGNING DATA AND BIOLOGY FOR ENHANCING EXPRESSION

### 4:20 A Deep Learning Model Trained on Expressed Transcripts across Different Tissue Types Reveals Cell-Type Codon-Optimization Preferences

*Sandhiya Ravi, PhD, Postdoctoral Research Associate, University of Massachusetts Chan Medical School*

Our deep learning framework analyzes highly expressed transcripts across multiple tissue types to uncover cell-type-specific codon-usage rules. By learning these endogenous patterns, the model generates optimized transgenes—without altering the amino acid sequence—that improve translation efficiency over wild-type and commercial tools. Using EGFP and luciferase benchmarks, we demonstrate enhanced expression across tissues and consistent *in vivo* AAV validation. This highlights data-driven codon design as a powerful strategy for optimizing protein expression.

### 4:50 Rethinking Transgene Design for Protein Expression

*Jarrod Shilts, PhD, Group Leader, ExpressionEdits Ltd.*

Despite recent advances in our understanding of genetic features that promote robust protein expression, transgenes in biotechnology have remained largely unchanged for decades. Natural human genes are rich in intron sequences that can drive these crucial expression benefits, but were previously difficult to replicate in artificial transgenes. At ExpressionEdits, we're changing this by deciphering 'genetic syntax' using high-throughput screening and machine learning to design intronized transgenes with improved protein expression.

nuclera

### 5:20 Evaluating Codon Optimization Strategies for Mammalian Protein Production with an Open-source Expression Vector

*Haisun Zhu, PhD, Associate Director, Antibody Platform, Institute for Protein Innovation*

Systematic comparison of mammalian codon optimization methods based in common/rare codon usage, RNA stability, and oligo assembly efficiency of 21 human and murine proteins lead to surprising conclusion that extensive codon optimization is not necessary for homologous recombinant protein expression in mammalian cells.

### 5:50 Leveraging Regulatory Elements to Improve Protein Yields

*Monir Ejemel, Senior Scientist, Discovery Biotherapeutics, Bristol Myers Squibb Co*

Leveraging regulatory elements such as re-engineered promoters and optimized terminator polyA sequences can significantly enhance protein yields. By strengthening promoter activity, transcription initiation is increased, while improved polyA terminators ensure efficient mRNA processing and stability. Together, these modifications boost gene expression, leading to higher protein production. This approach is valuable in biotechnology and therapeutic protein manufacturing, where maximizing protein output is essential for cost-effective and scalable production

### 6:20 Networking Reception in the Exhibit Hall with Poster Viewing

### 7:20 Close of Optimizing Protein Expression Conference

## SUNDAY, MAY 10

## 2:00 pm Recommended Pre-Conference Short Course

SC1: *In silico* and Machine Learning Tools for Antibody Design and Developability Predictions

\*Separate registration required. See short course page for details.

## TUESDAY, MAY 12

## 6:30 pm Recommended Dinner Short Course

## SC9: Automation in Action: Hands-on, Liquid Handling for Protein &amp; Antibody Engineering

\*Separate registration required. See short course page for details.

## THURSDAY, MAY 14

## 7:30 am Registration Open

## 7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast

Moderator: Catharine Smith, Executive Director, Termeer Foundation

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

Panelists:

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Noor Jaikhani, PhD, CEO &amp; Co-Founder, Matrisome Bio

## 8:30 Transition to Sessions

## 8:40 Organizer's Remarks

Mary Ann Brown, Executive Director, Conferences, Cambridge Healthtech Institute

**WORKFLOW MANAGEMENT: MEETING NEEDS BY INCREASING PRODUCTION EFFICIENCY**

## 8:45 Chairperson's Remarks

Jessica Williamson, PhD, Head, US Protein Sciences, UCB

**8:50 FEATURED PANEL DISCUSSION: Tailored to Fit: Protein Production for the Evolving Needs of Drug Discovery**

Moderator: Jessica Williamson, PhD, Head, US Protein Sciences, UCB

Protein expression laboratories provide crucial reagents for many types of drug discovery efforts. This panel discussion will focus on the concepts, technologies, and strategies necessary to meet a large variety of recombinant protein needs.

- Scale and throughput
- Challenging proteins
- Managing people and resources
- Method development and new technologies
- Data management strategies

Panelists:

Heather Lopes, Director &amp; Head, Protein Sciences, Aera Therapeutics

Anand Narayanan, PhD, Senior Scientist, Biologics Discovery, Johnson &amp; Johnson

Ayla Sessions, Associate Director, AstraZeneca

**9:50 Introducing DRACO, an End-to-End Automated Cell Culture Seed Production Platform**

Daniel Poole, PhD, Senior Scientist, Biologics HTP Expression Sciences, Johnson &amp; Johnson Innovative Medicine

Maintaining sufficient volumes of high-quality seed culture is a major challenge, especially as more automated production platforms come online. These platforms typically demand 10-100L of cell culture with ~99% viability each week, which at this scale is labor-intensive and difficult to automate. Here we are introducing a fully-automated platform to resolve these issues and bring reliability and scalability to traditional cell culture work.

**10:20 Transgenic Drosophila: Turning Drug Discovery Dead-ends into Runways for Development**


Matt Anderson-Baron, Co-founder &amp; CEO, Future Fields

Drug discovery is often stalled by limited access to crucial proteins. Common bottlenecks include the "scale-up cliff," expression challenges, poor quality, and unstable clones. Traditional systems force trade-offs between speed, stability, and functionality, leaving critical projects shelved.

Future Fields presents the EntoEngine™, a transgenic Drosophila-

based platform designed to bypass these barriers. Through multiple case studies, attendees will learn how whole fruit flies can bring shelved projects back into development.

**10:50 Coffee Break in the Exhibit Hall with Poster Viewing**
**ENTREPRENEUR MEET-UP**
**Fostering Entrepreneurship and Models for Start-Ups**

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

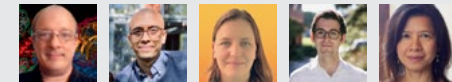
Catharine Smith, Executive Director, Termeer Foundation

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

**PLENARY FIRESIDE CHAT**

**11:35 Plenary Fireside Chat Introduction**

Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.

**11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience**


Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation

The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

Panelists:

Surge Biswas, PhD, Founder &amp; CEO, Nabla Bio, Inc.

Rebecca Croasdale-Wood, PhD, Senior Director, Augmented

Biologics Discovery & Design, Biologics Engineering,  
Oncology, AstraZeneca

Joshua Meier, Co-Founder & CEO, Chai Discovery

Maria Wendt, PhD, Global Head (Vice President) of Digital and  
Biologics Strategy and Innovation, Large Molecule Research,  
Novel Modalities, Synthetic Biology and AI, Sanofi

**12:35 pm Networking Luncheon in the Exhibit Hall and Last  
Chance for Poster Viewing**

## DATA MANAGEMENT: MEETING NEEDS BY INCREASING PRODUCTION EFFICIENCY

**2:05 Chairperson's Remarks**

Mandy Li, Scientist II, Discovery Biologics, Merck & Co.

**2:10 Expanding Solutions for Microfluidic Biologics: Novel  
Platform for Next-Generation Protein and Nucleic Acid  
Characterization**

Kathryn A. Whitehead, PhD Candidate, Tripathi Lab, Biomedical  
Engineering, Brown University

Next-Generation biologics for biotherapeutics and drug development requires advanced and complex characterization assays. We present a novel device that enables complete sample preparation, including thermal heating, centrifugation, filtration, viscosity independent ML/AI integrated liquid handling, vacuum washing, and microfluidic electrophoresis procedures. This device enables higher complexity microfluidic characterization assays, particularly protein-based assays for biotherapeutic development to run independently, efficiently, and reproducibly.

**2:40 Harnessing Design of Experiments and Automation,  
Significantly Improves Transient Protein Production and  
Accelerates Drug Discovery**

Mandy Li, Scientist II, Discovery Biologics, Merck & Co.

Rapid protein production is crucial to enable early-stage discovery and lead optimization. This talk will highlight the integration of Design of Experiments (DOE) methodologies with automated liquid handling to systematically optimize key factors in a transient Chinese Hamster Ovary (CHO) expression system. Factors include plasmid DNA usage, transfection reagent, and transfection and feeding strategies to increase protein yield, while maintaining culture scale and compatibility with high-throughput automated protein production.

**3:10 Cell-Free Expression of 20,000+ AI-Designed Proteins  
for Lab-in-the-Loop Validation**

Julian Englert, MS, Co-Founder and CEO, Adaptiv Biosystems

Adaptiv Bio operates an automated cloud laboratory for high-throughput protein validation, serving over 50 companies, from major biopharmas to frontier AI labs. We present our experience expressing over 20,000 AI-designed proteins using cell-free systems, systematically evaluating expression tags, codon optimization strategies, and system variants. We describe integrating these workflows into a fully automated platform capable of expressing arbitrary customer proteins at scales from sub-microgram to milligram quantities.

**3:40 Accelerating the Development of Stable  
High-Producing Clones with the Gibco  
CHOvantage GS Cell Line Development Kit**



Matthew Smoskey, Senior Manager, R&D, Thermo Fisher Scientific Inc.

Cell line development (CLD) remains a major bottleneck due to long timelines, variable productivity, and limited pool-to-clone predictability, particularly for complex biologics such as bispecific antibodies and Fc-fusion proteins. A novel transposon-based CHO-K1 CLD platform was evaluated for mAb, bsAb, and Fc-fusion expression. Stable, high-producing cell lines were generated in under 14 weeks, with consistent 3–5 g/L pools correlating to clone titers >7 g/L. Clones scaled up successfully while maintaining stable expression and product quality.

**4:10 Networking Refreshment Break**

## THINK TANKS

**IN-PERSON ONLY THINK TANKS**

Mary Ann Brown, Executive Director, Conferences, Cambridge  
Healthtech Institute

- What challenges do we face?
- What improvements do you apply?
- What might address future needs?

**5:10 Think Tank Report Outs: Listen and Learn**

During the Think Tank Table discussions, we shared our experiences and working solutions for end-to-end protein production workflows. Now as a collective community, let's hear from the table facilitators as they share key discussion points and strategies. What can we take away and apply?

**5:40 Close of Day**

**FRIDAY, MAY 15**

**7:15 am Registration Open**

## INTERACTIVE ROUNDTABLE DISCUSSIONS

**7:30 Interactive Roundtable Discussions with  
Continental Breakfast**

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

**TABLE 5: Use of AI Tools to Optimize Protein Production**

Adam Carr, Associate Director, Cell Free Production, BigHat  
Biosciences

- Where have you seen AI transforming the production value chain the most (yield optimization, purification, formulation, etc.)?
- What parts of protein production remain unchanged by the implementation of AI tools and why do you think that is the case?
- If you could magically have AI improve one part of the process, what would it be?

**TABLE 6: Streamlining Protein Production: Improving  
Throughput and Eliminating Bottlenecks**

Mansi Malhotra, PhD, Advisor, Product Development, Elanco Animal  
Health

- Map Your Bottlenecks - Where Does Time Actually Get Lost?
- Automate Smarter, Not Harder: Automating for Speed and Consistency
- Turning Data into Actionable Insights
- Faster Testing Without Compromising Quality
- Designing Workflows That Scale: AI-Enabled Predictive Developability

## FROM AUTOMATION TO ANALYTICS: MAXIMIZING PROTEIN WORKFLOWS

**8:25 Chairperson's Remarks**

Brian E. Hall, PhD, Distinguished Scientist, Large Molecule Research,  
Sanofi



### 8:30 Automating Ultra-High-Throughput Protein Production by Synthetic Biology and AI

*Haotian Guo, PhD, Founder & CEO, Ailurus Bio*

High-throughput protein production remains a time-consuming, expensive bottleneck that relies heavily on trial-and-error experiments. Here we present a holistic, automation-friendly solution to maximize the efficiency, by leveraging synthetic biology and AI techniques. It involves the application of a massive library for multiplexed expression improvement and AI-aided optimization, and chromatography-free purification via synthetic organelles *in vivo*. This integrated pipeline de-risks discovery by making protein production a predictable, scalable, and automated engineering task.

### 9:00 Using High-Throughput Analytics to Streamline Multispecific Antibody Production

*Brian E. Hall, PhD, Distinguished Scientist, Large Molecule Research, Sanofi*

Production of multispecific antibodies is often complicated by product related impurities, such as mispaired species and half molecules. Without repeated productions and process optimization, it is hard to predict the impurities and downstream process. We will share an analytics platform that is implemented at harvest, prior to affinity chromatography consisting of HT MS, cGE, and analytical HPLC, to help quantitate impurities and guide purification strategies.

### 9:30 High-Throughput Protein Purification Meets Next-Gen DEL: A New Era in Chemoproteome Discovery

*Edward Kraft, PhD, Senior Director, Small Molecule Discovery, Leash Bio*

Mapping the human intracellular chemoproteome is a major frontier for drug discovery. I will present an optimized HT protein expression–purification pipeline integrated with a next-generation HT DEL screening platform designed to reduce historical noise sources through reengineered methodologies. With nearly 1,000 human proteins profiled, we reveal clearer protein–small-molecule interaction patterns and highlight how large, high-quality DEL datasets can significantly enhance the impact of ML/AI in SM therapeutic discovery.

### 10:00 From Complexity to Consistency: HighThroughput Screening Strategies for Scalable Multispecific Antibody Development

*Valeria Guzman, Asso. Principal Scientist - Process Development, Manufacturing, Catalent*

The rapid expansion of complex molecules demands downstream platforms that deliver both speed and performance. Our integrated purification framework is built on molecule specific high-throughput approaches to increase efficiency, reduce cycle time, and product quality aligned with patient-first standards. A representative bs mAb case study demonstrates our platform's performance. Molecule-specific affinity selection combined with intermediate and polishing optimization achieved 100% main peak purity by SEC-UPLC, achieving yields comparable to those for mAbs.

### 10:30 Networking Coffee Break

### 10:45 Enhancing Capability through Optimized Preparative and Small-Scale Workflows

*Heather Lopes, Director & Head, Protein Sciences, Aera Therapeutics*

Protein Sciences at Aera Therapeutics has developed a robust multi-production platform that encompasses multiple expression systems, utilization of complex chromatography over automated 4-step and 2-step preparative purifications, and a robust internally built yeast display platform.

### 11:15 Accelerating the Drug Discovery Pipeline: Rapid Production and Characterization of Biologics to Shorten the Hit-to-Lead Timeline

*Anand Narayanan, PhD, Senior Scientist, Biologics Discovery, Johnson & Johnson*

Mammalian cell transfection enables the rapid generation of diverse large-molecule modalities for drug discovery. We have built an automated ecosystem to produce highly pure, complex antibodies suitable for cell-based functional assays and developability assessments. Although automation of protein production has grown exponentially in recent years, automated QC and characterization platforms remain challenging. Here, we present



a high-throughput workflow for protein quantification and purity evaluation that accelerates hit-to-lead progression.

### 11:45 PANEL DISCUSSION: Streamlining Discovery Pipelines

*Moderator: Brian E. Hall, PhD, Distinguished Scientist, Large Molecule Research, Sanofi*

This panel showcases how automation, high-throughput analytics, and optimized purification enable faster, more reliable protein production. Experts explore strategies for integrating advanced characterization techniques to ensure quality and reproducibility across the entire workflow. The discussion highlights approaches that accelerate biologics development, streamline hit-to-lead timelines, and connect production directly to discovery. Attendees will leave with actionable insights for maximizing efficiency from protein expression through purification and characterization.

*Panelists:*

*Haotian Guo, PhD, Founder & CEO, Ailurus Bio*

*Edward Kraft, PhD, Senior Director, Small Molecule Discovery, Leash Bio*

*Heather Lopes, Director & Head, Protein Sciences, Aera Therapeutics*

*Anand Narayanan, PhD, Senior Scientist, Biologics Discovery, Johnson & Johnson*

### 12:15 pm Close of Summit

# ANALYTICAL STREAM

## New Methods and Technologies to Support Development of Next-Generation Biotherapeutics

The Analytical Stream at the PEGS Boston Summit 2026 offers cutting-edge programs focused on advancing analytical science for next-generation biotherapeutics. ML and Digital Integration in Biotherapeutic Analytics will showcase how automation, AI, and data strategy are reshaping analytical workflows, from assay design and predictive modeling to digital twins and real-time release testing. Biophysical Methods will highlight innovations in high-throughput and miniaturized assays, mass spectrometry, and image-based tools for characterizing new modalities, with a focus on predictive modeling, developability, and solutions to formulation challenges. And, Characterization for Novel Biotherapeutics will cover emerging modalities including genetic medicines, cell therapies, radiotherapies, next-generation conjugates, and oligonucleotide and peptide therapeutics, exploring both analytical strategies and regulatory considerations. Together, these programs provide a comprehensive view of the tools driving biotherapeutic innovation forward.



ANALYTICAL  
STREAM  
CONFERENCES

MAY 11-12

## ML and Digital Integration in Biotherapeutic Analytics

AGENDA

MAY 12-13

## Biophysical Methods

AGENDA

MAY 14-15

## Characterization for Novel Biotherapeutics

AGENDA

**SUNDAY, MAY 10**

2:00 pm Recommended Pre-Conference Short Course

**SC1: *In silico* and Machine Learning Tools for Antibody Design and Developability Predictions**

\*Separate registration required. See short course page for details.

**MONDAY, MAY 11**

7:00 am Registration and Morning Coffee

8:20 Organizer's Opening Remarks

**USE CASES OF ML/AI IN ANALYTICAL DEVELOPMENT**

8:25 Chairperson's Remarks

*Alejandro Carpy, PhD, Senior Director, Protein Sciences and Analytics, Biologics Engineering, AstraZeneca R&D***8:30 Challenges in Digital Representation and Bioanalytical Characterization of Antibody-Drug Conjugates***Joel Bard, PhD, Research Fellow, Bioinformatics, BioMedicine Design, Pfizer*

Antibody-drug conjugates present challenges around compound registration and property prediction. Antibodies are registered as amino acid sequences. Calculation of properties like molecular weight is straightforward. Small molecules also have a variety of formats for registration of compounds and software tools for property calculation. When small molecules and antibodies are conjugated, the problems of registration and property calculation become more complex. We will discuss approaches to solving these problems.

**9:00 Digitalization and Automation of Immunoassay in Bioanalysis***Andreas Hald, PhD, Manager, Research Bioanalysis, Novo Nordisk*

Immunoassay platforms are widely used in bioanalytical studies as they offer high sensitivity, specificity, require low sample volume, and are 384-well plate compatible. However, automation of immunoassays is challenged by extensive protocols and the complexity of assay development. To enhance bioanalytical workflows, we leverage digitalization and integrated automation for assay development and sample analysis. This presentation will cover our current E2E-platform and our next steps in digitalization, AI, and automation.

**9:30 KEYNOTE PRESENTATION: From Targets to Biologics: AI Powering the Next Leap in Discovery at Takeda***Yves Fomekong Nanfack, PhD, Head of AI/ML Research, Takeda*

Takeda's AI/ML strategy is redefining the path from targets to biologics, using advanced models to identify and validate novel targets, decode complex biology, and design the next generation of high-quality therapeutic molecules. By integrating agentic, generative, and large language model-driven approaches, AI is powering the next leap in discovery at Takeda.

**10:00 3dpredict: Scalable High-Quality Developability Predictions***Alain Ajamian, Director of Business Development, Chemical Computing Group*

Predicting potential liabilities such as aggregation or viscosity is a key step in monoclonal antibody development. Computational property prediction methods are routinely used in the selection and optimization of candidate antibodies. High-quality property prediction involves prediction of ensembles of 3D structures at specified pH to reduce sensitivity to single conformational states. We will present 3dpredict/Ab, a solution that enables ensemble-based predictions of antibody developability descriptors and putative liabilities. 3dpredict/Ab allows for out-of-the-box SaaS automation and integration of such complex simulations of hundreds or thousands of sequences, making them accessible and efficient.

**10:15 Direct Observation of Anomalous Thickening During liquid-liquid Collision Predicts Antibody Developability Failure***Shamit Shrivastava, Co-Founder & CEO, Apoha*

Antibody liabilities like aggregation, viscosity, and instability arise from the interplay of conformational, colloidal, and interfacial properties, yet existing assays probe these in isolation. We collide antibody droplets with a chemically distinct liquid surface, imposing concurrent interfacial, elongational, and ionic stress in a single ~20 ms event from <10 µg at 0.1 mg/mL. High-speed imaging reveals that liability-prone molecules undergo anomalous gel-like behavior at the collision neck; a stochastic, viscoelastic arrest that predicts clinical-stage failure with ~90% precision across 236 antibodies.

**10:30 Networking Coffee Break****11:00 Toward an Automated and Auditable HPLC Chromatography Analysis Workflow***Zeran Li, PhD, Data Scientist, Moderna*

I will present an envisioned automated analytical workflow for RPIP-HPLC chromatograms, covering baseline inference, retention-time alignment, peak detection, deconvolution, and quantification. Parameter settings are optimized via Bayesian search. Every step—from raw-file ingestion and versioned configurations to QC metrics, anomaly flags, a cautious LLM-assisted reviewer-triage step to aid manual review and decision-making—is logged with immutable provenance, enabling auditability and supporting GxP compliance. We target cross-modal applicability without prescribing instrument-specific workflows.

**11:30 Unlocking the Capabilities of Microfluidic Electrophoresis for the Development of Protein-Based Therapeutics Using Predictive Analytics.***Jenna Rutberg, Researcher, Biomedical Engineering, Brown University*

We will discuss innovative methods that use both size-based and charge-based automated microfluidic electrophoresis to analyze different types of proteins and how this translates to the drug discovery and development process. We will also discuss how the results from these findings can be paired with artificial intelligence and how our predictive analysis method can be used for reagent manufacturing protocols for microfluidics applications.

**12:00 pm Session Break****12:10 LUNCHEON PRESENTATION: From Literature to Leads: AI-Powered Evidence Synthesis for Protein & Antibody Engineering***Xiangxu Kong, PhD, Scientific Leader, Elicit PBC*

Antibody and protein engineering teams must navigate a rapidly expanding body of published research — from sequence-function relationships and developability heuristics to competitive molecule characterization — yet literature synthesis remains manual, inconsistent, and hard to audit. We describe how discovery and protein sciences teams at leading pharma organizations are using AI to search, extract, and synthesize findings across thousands of publications in minutes, accelerating workflows like target-class landscape reviews, epitope and paratope mining, and developability benchmarking. Drawing on pilot deployments at top-20 pharma companies, we share early results on time-to-insight improvements and the design principles — citation-level provenance, systematic coverage, and human-in-the-loop validation — that make AI-assisted synthesis rigorous enough to trust at the bench.

**APOHA**



### 12:40 LUNCHEON PRESENTATION: Benchling Benchling Biologics: AI Infrastructure for Modern Antibody Discovery

Lily Helfrich, Product Manager, Scientific Modalities, Product Management, Benchling

Antibody programs sit on years of data that should be an ML advantage. In practice, it rarely is. Data infrastructure hasn't kept pace with novel formats, leaving data siloed and relationships missing. AI-driven discovery demands a standard nomenclature and connected experimental context. We introduce Benchling Biologics—antibody registration with structural awareness and automated annotation across mAbs, bispecifics, and fusions—and show how teams unlock faster DBTL cycles with structured data.

1:10 Session Break

## ML/AI IMPACTS ON DEVELOPMENT PIPELINES

### 1:15 Chairperson's Remarks

Yi Han, PhD, Principal Scientist, Data Science, Biologics Development, Bristol-Myers Squibb

### 1:20 From Prediction to Purification: A Scalable HT Strategy for Multispecifics Manufacturing

Alejandro Carpy, PhD, Senior Director, Protein Sciences and Analytics, Biologics Engineering, AstraZeneca R&D

We present an integrated high-throughput workflow combining predictive modeling and automated purification to accelerate multispecific development. Leveraging data-driven parameter optimization and digital analytics, this scalable strategy enhances yield, robustness, and process consistency across diverse molecule classes including DuetMab and TITAN formats. Our standardized platform demonstrates significant efficiency gains, enabling rapid transition from design to manufacturing while maintaining quality standards for complex biotherapeutics.

### 1:50 Integrating Machine Learning and *in silico* Property Prediction into a Computational Workflow to Support CMC Development

Colin Stackhouse, Senior Scientist, Biologics Analytical Development, Johnson & Johnson Innovative Medicine

Antibody product quality is influenced by an interplay of extrinsic factors and inherent structural attributes of the molecule. To deconvolute the role of structural features on protein-protein

interactions, a database of *in silico* surface properties was utilized to map the biophysical feature space. An outlier detection algorithm was developed to identify structures with properties divergent from central tendencies in the data, identifying key regions in the latent space traceable to PPI outcomes.

### 2:20 Enabling Analytical Excellence: The Impact of Digital Integration in Clinical Method Performance

Yi Han, PhD, Principal Scientist, Data Science, Biologics Development, Bristol-Myers Squibb

Explore how digital tools and data automation are advancing the monitoring, evaluation, and enhancement of analytical methods for separation, impurity, and potency. Innovative strategies for integrating data and harnessing real-time insights will be showcased, enabling streamlined workflows and driving continuous improvement across the entire analytical lifecycle—elevating data quality, operational efficiency, and method performance in biotherapeutic analytics.

### 2:50 Decoding Bispecific Developability: Lessons from the Rational Design and Analysis of a 160-Member bsAb Library



Ammar Arsiwala, Director, Antibody Developability, Ginkgo Datapoints

We explored how parental Fab liabilities dictate the fate of final bispecific assembly, often guided by the "Rule of Additivity." Using a diversity-maximizing approach and profiling parental mAbs, we rationally designed and expressed a 160-member bispecific library. Applying Ginkgo's PROPHET-Ab platform, we generated a high-dimensional dataset to identify where parental inheritance holds versus where it breaks down. Our results shed light on the limits of linear additivity, characterizing "emergent" liabilities that escape standard predictions. This talk will highlight key correlations and significant decouplings between Fab-arm and bsAb attributes, supporting a more nuanced roadmap for de-risking complex biologics.

### 3:20 Networking Coffee & Refreshment Break

### 4:05 Transition to Plenary Keynote Session

## PLENARY KEYNOTE



### 4:15 Plenary Keynote Introduction

G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company



### 4:25 CARs 2026: New Models and New Runways

Michel Sadelain, MD, PhD, Director, Columbia University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center

T cell engineering holds great promise for the treatment of cancers and other pathologies. The original chimeric antigen receptor (CAR) prototypes targeting CD19 are now giving way to further refined receptors endowed with greater sensitivity and combinatorial possibilities. Emerging new targets and engineering tools augur favorably for broadening the use of CAR therapies.

## YOUNG SCIENTIST KEYNOTE



### 5:10 Deep Learning-Based Binder Design to Probe Biology

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Protein-protein interactions are central to biology and drug discovery, yet traditional antibody generation is slow and costly. BindCraft is an open-source, automated computational pipeline for *de novo* protein binder design that routinely yields nanomolar binders with 10-100% experimental success, without high-throughput screening or maturation. We illustrate applications to peptides, cell-surface receptors, allergens, and gene editors, and outline how deep-learning workflows can accelerate next-generation therapeutics, diagnostics, and bioprocessing.ion in the Exhibit Hall with Poster Viewing

### 5:55 Welcome Reception in the Exhibit Hall with Poster Viewing

## YOUNG SCIENTIST MEET-UP

### Young Scientist Meet-Up

Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University  
Gian Marco Visani, PhD Graduate Student, University of Washington  
Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology



This young scientist meet-up is an opportunity to get to know and network with mentors of the PEGS community. This session aims to inspire the next generation of young scientists by giving direct access to established leaders in the field.

- Get to know fellow peers and colleagues
- Make connections and network with other institutions
- Discuss the role of mentors and peers role models in the field

7:15 Close of Day

TUESDAY, MAY 12

7:45 am Registration and Morning Coffee

**DIGITALIZATION AND AUTOMATION****8:30 Chairperson's Remarks**

Melody Shahsavarian, PhD, Director, Data Strategy & Digital Transformation, Biotherapeutics Discovery Research, Eli Lilly & Company

**8:35 Engineering Success: High-Throughput Developability for Next-Generation Biotherapeutics**

Maniraj Bhagawati, PhD, Senior Scientist and Lab Head, Functional Characterization, Large Molecule Research, Roche pRED

To meet the demand for subcutaneous, high-concentration biologics, predicting protein behavior (e.g., viscosity, aggregation) is crucial yet challenging. We introduce an integrated, automated platform for early discovery screening. This process combines high-throughput, low-mass assays with *in silico* developability assessments to predict critical solution parameters and risks across diverse molecule formats, optimizing developability from inception.

**9:05 Scaling Developability: Automating High-Throughput Assays for Early Developability Assessment**

Andrew Dippel, PhD, Associate Director, Protein Analytics & Developability, AstraZeneca

Modern biotherapeutic pipelines demand truly high-throughput, automated developability assessment to evaluate increasing candidate volumes efficiently. This presentation explores implementing standardized, automated assay platforms to generate comprehensive, high-quality developability datasets. By establishing this high-throughput developability data collection, we enable early identification of developability risks before costly downstream manufacturing issues arise, and generate the datasets essential for training robust machine-learning models.

**9:35 From Automation to Visualization: Robotic Sample Preparation, High-Throughput Developability Analysis, and Dashboards**

Jan Paulo Zaragoza, PhD, Associate Principal Scientist, Discovery Biologics, Merck

This talk introduces a data-centric platform that combines robotics, high-throughput biophysical characterization, and decision-ready visualization. Automated liquid handling standardizes sample prep and scales throughput, while multiplexed assays quantify biophysical and stability parameters to identify risks early. Case studies show shorter cycles, improved data quality, and stronger portfolio decisions, with sample traceability, method validation, and seamless integration across automation platforms and informatics systems.

**10:05 Talk Title to be Announced**

Jana Hersch, Head of Science, Genedata AG

**10:35 Coffee Break in the Exhibit Hall with Poster Viewing****PROBLEMS AND SOLUTIONS****11:15 Fit-for-Purpose Automation: Adapting Platforms to Our Science**

Nick Mukhitov, PhD, Principal Research Scientist, AbbVie

We will share strategies leveraged in our group to enable forward compatibility of our platforms. We will address automation, data capture and custom engineering solutions to adopt our instrumentation to our science.

**11:45 Democratizing Data and AI for Biologics Research**

Melody Shahsavarian, PhD, Director, Data Strategy & Digital Transformation, Biotherapeutics Discovery Research, Eli Lilly & Company

Advances in automation and AI have revolutionized the field of biologics discovery. Quantity of data is exponentially increasing, and ML architectures are rapidly improving. Key to leveraging this technological revolution lies in accessibility of data and AI. I will talk about our efforts at Lilly in developing an integrated digital platform that allows us to fully leverage experimental and data science toward improved decision-making and accelerated DMTA cycles.

**12:15 pm High-Throughput Structural Biology for AI-Enabled Antibody Discovery**

Speaker to be Announced, Biortus



Biortus' high-throughput structural biology platform enables parallel exploration of epitope and affinity space, producing thousands of

antibody-antigen structures per target. Using X-ray crystallography, cryo-EM, and NMR, we create fit-for-purpose datasets that enable AI-driven antibody design.

**12:45 Session Break****12:50 LUNCHEON PRESENTATION: The PAIA Developability Assay Platform for the Fast and Comprehensive Biophysical Screening of Different Antibody Formats**

Sebastian Giehring, PAIA Biotech GmbH

Developability assessment remains a bottleneck in early antibody discovery. PAIA's plate-based developability assay platform provides a fast and easy-to-automate way to characterize hundreds to thousands of molecules per day. In this presentation we show developability screening data for different samples sets of mAbs, VHH-Fc-fusions and bispecifics, and compare the results with orthogonal and published data.

PAIA

**1:20 LUNCHEON PRESENTATION: Closing the AI Data Loop: Automated High-Throughput Triage of *in silico* Antibody Hits**

Michael Chen, CEO & Co-Founder, Nuclera

Generative AI accelerates discovery, but few of hits are viable. Testing panels in 6 week mammalian workflows wastes resources and delays ML training. Our antibody screening service uses cell-free protein synthesis (CFPS) to deliver binding data for 94 variants in 24 hours. With CHO-equivalent binding profiles, CFPS enables rapid triage, ensuring only top candidates advance to SPR. Close your AI data loop faster.

nuclera

**1:50 Close of ML and Digital Integration in Biotherapeutic Analytics Conference****6:30 Recommended Dinner Short Course****SC6: Developability of Bispecific Antibodies**

\*Separate registration required. See short course page for details.

## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

**SC1: In silico and Machine Learning Tools for Antibody Design and Developability Predictions**

\*Separate registration required. See short course page for details.

## TUESDAY, MAY 12

1:50 pm Networking Coffee &amp; Dessert Break in the Exhibit Hall with Poster Viewing

2:20 Organizer's Opening Remarks

**BIOPHYSICAL CHARACTERIZATION FOR NEW MODALITIES**

2:25 Chairperson's Remarks

*Deborah J. Moshinsky, PhD, Director, Antibody Characterization & Validation, Institute for Protein Innovation*

2:30 Microfluidic Multi-Attribute RNA Analysis: Purity, Content, and Length

*Adriana Coll De Peña, PhD, Scientist, Moderna*

Rapid and reliable assessment of RNA purity, content, and length is essential to advance mRNA therapeutic development. Here, we present a high-throughput microfluidic multi-attribute method for directional analysis of mRNA, LNP, and DP samples. This approach streamlines characterization by enabling simultaneous evaluation of multiple RNA attributes, improving data turnaround and scalability while maintaining analytical quality and achieving substantial cost savings compared to traditional chromatographic methods.

3:00 Integrative Biophysical Characterization for Advanced Modalities in Biotherapeutic Discovery

*David Boggs, PhD, Senior Scientist, AbbVie*

In the discovery and development of novel biotherapeutics and genetic medicines, an increasingly complex landscape of antigen and therapeutic modalities demands synergistic implementation of advanced tools for robust characterization. We present an integrative toolkit for biophysical characterization combining dynamic light scattering, size-exclusion chromatography-multiangle light scattering, and microfluidic nano particle analysis that delivers deep insights to drive innovation in antibody-antigen, lipid nanoparticle, and virus-like particle platforms.

3:30 Early Discrimination of Antibody Candidates using an Integrated High-throughput SPR Screening and Characterization Workflow

*Linnea Nygren-Babool, Senior Scientist, Cytiva, R&D, Cytiva Life Sciences*

4:00 Refreshment Break in the Exhibit Hall with Poster Viewing

4:10 Speed Networking

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

**SPEED NETWORKING****Speed Networking: How Many New Contacts Can You Make?***Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute*

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

**ADVANCED IMAGING TOOLS FOR BIOPHYSICAL ANALYSIS**

4:40 Biophysical Profiling of T Cells Reveals Hidden Heterogeneity and Predicts Melanoma Immunotherapy Response

*Jiaquan Yu, PhD, Research Scientist, Massachusetts Institute of Technology*

In our under-review work, we show that resting CD8 $\beta$ T cells exhibit a bimodal distribution of buoyant mass, measured label-free by SMR, that defines intrinsic immune-fitness. In a neoadjuvant melanoma cohort, a pre-treatment T cell buoyant-mass profile stratified checkpoint-therapy response: a single "heavy-cell mass" metric achieved AUC 0.81, and a combined model reached AUC 0.88, outperforming tumor mutational burden. Mechanistically, "light" cells are activation-delayed/exhaustion-prone, whereas "heavy" cells are biosynthetically primed.

5:10 Structural Determination of Small Proteins by CryoEM Using a Coiled Coil Module Strategy

*Camille Samson, PhD, Senior Scientist, Structural Biology and Biophysics, Sanofi*

Cryo-EM is expanding to small proteins through innovative strategies. We resolved the structure of kRasG12C fused to APH2, achieving 3.7 Å resolution with visible MRTX849 and GDP. This scaffold-based method is simple and broadly applicable. We also explored alternative techniques for small proteins lacking terminal helices. These advances highlight Cryo-EM's growing role in drug discovery and structural analysis of diverse protein targets.



5:40 KEYNOTE PRESENTATION: High-Throughput Small-Angle X-ray Scattering (SAXS) Approach to Predict High-Concentration Viscosity from Dilute Samples

*Pin-Kuang Lai, PhD, Assistant Professor, Chemical Engineering and Materials Science, Stevens Institute of Technology*

High-concentration monoclonal antibody formulations face viscosity challenges caused by protein-protein interactions (PPIs), hindering manufacturing and subcutaneous delivery. To enable early viscosity risk assessment, a high-throughput SAXS protocol was developed to detect mAb self-association at dilute concentrations. SAXS analyses of 22 mAbs revealed low-q structure factor upturns (3–10 mg/mL) correlating with high viscosity. This approach accurately classified mAbs by viscosity, providing a scalable, low-sample alternative to traditional measurements.

6:10 Close of Day

6:30 Recommended Dinner Short Course

**SC9: Automation in Action: Hands-on, Liquid Handling for Protein & Antibody Engineering**

\*Separate registration required. See short course page for details.

## WEDNESDAY, MAY 13

8:00 am Registration Open

**PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL**

8:25 Chairperson's Remarks

8:30 Innovation in Protein Science with Young-Scientist Visionaries

*Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco*

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the



recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.

*Panelists:*

*Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich*

*Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University*

*Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School*

*Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder*

*Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School*

**9:15 Coffee Break in the Exhibit Hall with Poster Viewing**

**MENTORING MEET-UP**

**Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship**

*Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies*

*Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University*

**BIOPHYSICAL CHARACTERIZATION IN R&D**

**10:00 Chairperson's Remarks**

*Adriana Coll De Peña, PhD, Scientist, Moderna*

**10:05 A Novel, High-throughput, NanoHDX-MS Platform for Epitope and Paratope Mapping at Scale**

*Malvina Papanastasiou, PhD, Group Leader & Research Scientist, Proteomics Platform, Broad Institute*

We have recently developed a novel, high-throughput nanoscale HDX-MS (nHDX) platform for structural proteomics, delivering unprecedented sensitivity for complex protein systems. By reducing sample needs to the nanogram level, nHDX facilitates the rapid

screening of antibody-target interactions. This robust, automated platform provides high-resolution epitope/paratope mapping across a broad affinity range, reliably analyzing lower purity material and small batch purifications, bypassing the need for extensive front-end processing.

**10:35 Quantitative Characterization of Research Antibodies Using Orthogonal Biophysical and Cellular Methods**

*Deborah J. Moshinsky, PhD, Director, Antibody Characterization & Validation, Institute for Protein Innovation*

The Institute for Protein Innovation (IPI) has developed a scalable workflow that applies biophysical characterization standards from therapeutic antibody development to research-grade reagents. This systematic approach integrates surface plasmon resonance, flow cytometry, and immunofluorescence to assess binding kinetics, affinity, and functional performance. A distinguishing feature is comprehensive cross-reactivity profiling across related protein families, providing quantitative specificity insights that enhance reproducibility and confidence in antibody-based research tools.

**11:05 Crack the Protein Formulation Code with Aunty**



*Andre Mueller, Director, Product Management, Marketing, Unchained Labs*

To optimize stability and developability of current protein drugs, formulations and excipients are screened across multiple parameters. Aunty speeds this up by high-throughput, multi-attribute characterization in a 96-well SBS quartz plate. It combines full-spectrum DSF, SLS & DLS in one experiment and captures data necessary for informed decisions. I'll present an excipient screen of 4 proteins to identify stability drivers in a single experiment. Also tested were colloidal parameters kD & B22 and freeze/thaw behavior to provide a more complete view of the formulations.

**11:35 Session Break**

**11:40 LUNCHEON PRESENTATION: You Don't Know What You Don't Know—Integration of Advanced Analytical Tools into Biologic Development Workflows: Case Study**



*Eva Lindskog, Chief Commercial Officer, Sales, NanoTemper Technologies*

*Derrick Meinhold, Director, Biophysics, Biophysics, WuXi AppTec*

During development, a key objective is 'fail fast, fail cheap'. But what happens if you eliminate the right candidate for wrong reasons? A mitigation is to move critical measurements earlier in the

pipeline. High-throughput, automated analytical tools with low sample consumption that produce informative, relevant results, can decrease risk.

In this talk we will cover integration of data rich, automated, analytical tools such as Prometheus and Dianthus systems in early development. We will discuss the results produced, and how this data can be used to improve candidate selection.

**12:10 pm LUNCHEON PRESENTATION: 2bind Pharma Service—The Most Trusted CRO for Therapeutic Antibodies**



*Cosimo Kropp, PhD, CEO, 2bind GmbH*

When it comes to choosing your lead candidate, you need a partner you can trust. We support antibody screening, developability, and lead selection with comprehensive studies designed for each project phase. Our offer includes affinity ranking, stability assessments, real-time kinetics using recombinant protein and living cells, polyreactivity, and off-target testing. Our mission: to accelerate your discovery process with scientific excellence, transparency, and reliability at every step.

**INTERACTIVE BREAKOUT DISCUSSIONS**

**12:40 Find Your Table and Meet Your Discussion Moderator**

**12:50 Interactive Roundtable Discussions**

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

**TABLE 9: Modeling and Analytical Tools for Formulation Development of Novel Biologic Modalities**

*Pin-Kuang Lai, PhD, Assistant Professor, Chemical Engineering and Materials Science, Stevens Institute of Technology*

**TABLE 10: TABLE: Interpreting Biophysical Data in Antibody Validation: From Binding to Biological Relevance**

*Deborah J. Moshinsky, PhD, Director, Antibody Characterization & Validation, Institute for Protein Innovation*



## SPECTROSCOPIC APPLICATIONS AND TECHNOLOGIES

### 1:35 Chairperson's Remarks

Dan (Cassie) Liu, Principal Statistician, Bristol Myers Squibb

### 1:40 Automating MS Analytical Workflows for Novel Biologics

David Bush, PhD, Principal Scientist, Novartis Institutes for BioMedical Research

Mass spectrometry-based methods are some of the most informative assays in the biotherapeutic discovery toolkit but are difficult to automate due to complex and diverse preparation and instrument methods. Unique attribute reporting needs across different modalities and project phases increases the complexity of requirements for a harmonized data analysis solution. This talk will discuss 1) our robotic sample preparation and 2) a rapidly adaptable data-acquisition, data processing, and reporting pipeline.

### 2:10 High-Throughput Intact Mass QC for IgG and VHH-Fc with Automated Data Processing

Xinbi Li, PhD, Associate Principal Scientist, Biologics Engineering, AstraZeneca

High-throughput protein expression demands fast QC. Manual analysis and reporting were a bottleneck, consuming excessive hands-on analyst time and limiting throughput. We standardized rule-based QC criteria and automated extraction of key MS metrics to enable consistent pass/fail assessment. A web-based parsing and reporting tool cut hands-on time by ~80% while maintaining ~95% concordance. This framework delivers scalable, high-throughput intact MS QC and establishes the foundation for end-to-end automation.

### 2:40 Peak Exclusion-Driven Deep-Field LC-MS/MS for Enhanced HCP Detection

Leo Wang, PhD, Senior Scientist, Takeda

We present an automated deep-field LC-MS/MS workflow that dramatically improves detection of low-abundance host cell proteins without enrichment. By iteratively expanding peak-exclusion lists on the Orbitrap Exploris AcquireX platform, the method eliminates redundant sampling, boosts MS/MS quality, and uncovers HCPs missed by traditional DDA—even at far lower digest loading. Validated across multiple commercial mAbs, this approach delivers higher-confidence identifications and extends seamlessly to broader biologics characterization.

### 3:10 Allosteric Binding Effect of Zenocutuzumab Highlighted by Dual Binding Assay

Stuart Knowling, Principal Scientist, Application Development, Sartorius AG

Bispecific molecules can bind two targets simultaneously, making accurate assessment of their binding interactions essential. Label-free, real-time platforms like Biolayer Interferometry (BLI) provide critical insights, enabling high-throughput screening across a wide range of molecular formats. This presentation highlights how Octet® BLI assesses multiple binding parameters of zenocutuzumab, exploring whether antigen binding is independent or sequential, and methods to evaluate bispecific antibody production ratios.

### 3:25 Mass Photometry Reveals Stoichiometry and Binding Dynamics of Multispecific Antibodies

Gael Nicolas, Associate Director, Key Accounts, Sales, Refeyn

A range of techniques has been developed to characterise proteins and their interactions, but structural and dynamic heterogeneity remain a fundamental challenge. Mass photometry (MP) enables accurate mass measurement of single molecules in solution, in their native state and without the need for labels, opening new possibilities for bioanalytics and research into biomolecular functions. MP is based on interferometric scattering microscopy, attaining mass information of biomolecules in solution by measuring the light that they scatter. We demonstrate how MP can be used to bridge analytical gaps in multispecific antibody characterization workflows, support formulation development, process optimization, and QC. Due to its unique benefits, mass photometry addresses a major unmet need for more efficient analytical tools and will ultimately help accelerate science and the discovery and development of new therapeutics.

### 3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing

### 4:20 Therapeutic RNA Structure Analysis Achieved by Ultra-High-Field NMR

Takanori Kigawa, PhD, Senior Scientist, RIKEN Center for Integrative Medical Sciences

NMR spectroscopy holds great promise for RNA-based drug discovery. However, the low proton density in RNA limits short-range structural information, posing a challenge for NMR studies. Long-range restraints, such as residual dipolar couplings (RDCs), are crucial for accurate tertiary structure determination. Using a

SARTORIUS

REFEYN

state-of-the-art 1.3 GHz NMR, we successfully measured RDCs of an RNA aptamer. This demonstrates the feasibility of obtaining precise structural insights into therapeutic RNA using Ultra-High-Field NMR.

## PROBLEMS AND SOLUTIONS

### 4:50 Accelerating Biologics Development with Predictive Stability Modeling

Dan (Cassie) Liu, Principal Statistician, Bristol Myers Squibb

Predictive stability modeling is revolutionizing biologic drug shelf-life evaluation by providing accurate long-term stability forecasts based on relevant short-term data. Several practical applications will be presented. The integration of scientific rigor and statistical robustness in these models supports critical CMC decision-making, optimizes stability filing strategies, and accelerates the development timeline for new biologic therapies.

### 5:20 Developability and Manufacturability Challenges for Alternative Modalities

Sagar V. Kathuria, PhD, Senior Principal Scientist, Large Molecule Research, Sanofi

Developability assessments are an important stage gate for antibody therapeutics. A thorough risk profiling of the leads in research is essential for effective selection, and success later in development. However, with complex formats, early risk profiling is not always predictive. Focusing on a core set of characteristics of a large panel of molecules in early research may have a bigger payoff in selecting more diverse leads and saving critical resources.

### 5:50 The Role of AUC in Characterizing the Complexity of Diverse Modalities in Evolving Pipelines

Zahid Khan, MS, Principal Scientist, R&D Analytical Development, GSK

Sedimentation Velocity Analytical Ultracentrifugation (SV AUC) is a powerful technique for characterizing therapeutics and vaccines. By directly analyzing size variants and polydispersity in native sample matrices across a broad dynamic range, it provides an ideal approach for assessing diverse drug candidates during development. This presentation showcases examples of how recent advancements in instrumentation and data analysis are enabling faster, more informative characterization of therapeutic proteins, oligonucleotides, and vaccines.

### 6:20 Networking Reception in the Exhibit Hall with Poster Viewing

### 7:20 Close of Biophysical Methods Conference

**SUNDAY, MAY 10**

2:00 pm Recommended Pre-Conference Short Course

**SC5: Safety & Efficacy of Bispecifics and ADCs**

\*Separate registration required. See short course page for details.

**TUESDAY, MAY 12**

6:30 pm Recommended Dinner Short Course

**SC6: Developability of Bispecific Antibodies**

\*Separate registration required. See short course page for details.

**THURSDAY, MAY 14**

7:30 am Registration Open

7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast

Moderator: Catharine Smith, Executive Director, Termeer Foundation

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

Panelists:

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Noor Jaikhani, PhD, CEO &amp; Co-Founder, Matrisome Bio

8:30 Transition to Sessions

8:40 Organizer's Remarks

**NEXT-GENERATION CONJUGATES**

8:45 Chairperson's Remarks

Rachel Liuqing Shi, PhD, Principal Scientist, Genentech, Inc.

**8:50 Multiplex Screening of Transferrin Receptor-targeted Lipid Nanoparticles for Systemic Brain Delivery Using DNA Barcodes**

Whitney Shatz-Binder, PhD, Senior Principal Scientist, Genentech Inc.

Lipid nanoparticles (LNPs) face significant barriers to central nervous system (CNS) penetration. By combining high-throughput screening with a transferrin receptor-targeting Fab, we evaluated a barcoded library of 23 LNPs via systemic injection. Quantitative PCR and sequencing revealed that Fab density and lipid composition are critical for CNS partitioning. This platform demonstrates

how integrating translatable ligands with *in vivo* screening can accelerate the rational design of brain-penetrant LNPs.

**9:20 Bioanalysis of Novel Antibody and Conjugate Formats Using Mass Spectrometry Approaches**

Rachel Liuqing Shi, PhD, Principal Scientist, Genentech, Inc.

Here, we present a fully automated multiplexed mass spectrometry assay that enables simultaneous quantitation of multiple antibodies *in vivo*, which has significantly reduced the number of animals required for in-life studies and accelerated antibody candidate selection. This automated platform is now being applied to biomarker quantitation, *in vivo* ADC conjugation site screening, and *in vitro* pharmacology studies of biotherapeutics.

**9:50 Innovative Protein Conjugation Strategies Supporting Biotherapeutic and Genetic Medicine Drug Discovery**

Ornella D. Nelson, PhD, Senior Scientist, Biotherapeutics &amp; Genetic Medicine, AbbVie

Chemical labeling of proteins is a key tool supporting biotherapeutic drug discovery, from initial discovery through development, enabling the capture, detection, and characterization of labeled proteins and their interacting partners. As therapeutics and their targets become increasingly complex, innovative conjugation strategies are needed. This presentation highlights tailored labeling approaches for generating and analyzing complex protein conjugates to support advances in drug discovery across multiple therapeutic areas.

**10:20 Utilizing SupersonicIEF to reduce the Maurice "Traffic Jam"**

Michael Grasso, Sr Scientist, Merck &amp; Co

In this study, we have explored the feasibility of using a previously published icIEF method, SupersonicIEF, which uses "blockers" within the master mix to allow for a faster, high voltage focusing time without losing sample resolution. We tested different molecules within Merck's large molecule pipeline to assess feasibility of a faster icIEF method. Our work demonstrates the relative ease of adopting a supersonicIEF method for many existing protocols, and can help establish a quicker, higher throughput charge variant analysis for in-process samples.

**10:50 Coffee Break in the Exhibit Hall with Poster Viewing**
**ENTREPRENEUR MEET-UP**

Fostering Entrepreneurship and Models for Start-Ups

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Catharine Smith, Executive Director, Termeer Foundation

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

**PLENARY FIRESIDE CHAT**

11:35 Plenary Fireside Chat Introduction

Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.

**11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience**


Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation

The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

Panelists:

Surge Biswas, PhD, Founder &amp; CEO, Nabla Bio, Inc.

Rebecca Croasdale-Wood, PhD, Senior Director, Augmented Biologics Discovery &amp; Design, Biologics Engineering, Oncology, AstraZeneca

Joshua Meier, Co-Founder &amp; CEO, Chai Discovery

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi

12:35 pm Networking Luncheon in the Exhibit Hall and Last Chance for Poster Viewing

## GENETIC AND CELLULAR THERAPIES

2:05 Chairperson's Remarks

*Ornella D. Nelson, PhD, Senior Scientist, Biotherapeutics & Genetic Medicine, AbbVie*



### 2:10 KEYNOTE PRESENTATION: Revolutionizing Technologies for RNA Analytical Workflows: Academic versus BioPharma Strategies

*Anubhav Tripathi, PhD, Professor, Engineering & Medical Sciences, Brown University*

Innovations in RNA analytical technologies are rapidly transforming how researchers characterize structure, integrity, and critical quality attributes of RNA-based therapeutics. This presentation will compare academic and biopharma strategies for deploying emerging workflows, from advanced separation and sequencing methods to automation and data-analytics platforms. Case studies will highlight differences in scalability, regulatory alignment, and resource models, offering insight into how diverse approaches can accelerate robust RNA characterization and development.

2:40 Mass Photometry Method Development for Viral Vector Characterization

*Anastasiia Vasiukhina-Martin, PhD, Advisor, BRD Analytical Development, Eli Lilly and Company*

Mass photometry (MP) has emerged as a powerful tool for rapid, label-free viral vector characterization on a single-molecule level, and has potential for future GMP adoption. However, significant work is needed to overcome current limitations and ensure robustness in regulated environments. This talk will focus on method development and discuss broader challenges and opportunities that could shape MP's future as a reliable tool in gene therapy analytics and beyond.

3:10 Optimizing an Immunoprecipitation Mass Spectrometry Workflow for Enrichment of Surface Proteins: Applications to Surrogate CAR T Cells

*Nicolle Serrano SantoDomingo, Senior Scientist, Novartis*

CAR-T cells are engineered T cells expressing a chimeric antigen receptor on the cellular surface. CARs lead T cells to engage

an antigen on tumor cells, activating downstream signaling leading to their destruction. Surface expression of the CAR is critical for therapeutic efficacy; often differences in efficacy are observed between constructs. We developed a workflow using immunoprecipitation of the CAR from the cell surface to characterize them by LC-MS (IP-MS).

3:40 Optimizing Therapeutic Antibodies by Balancing the Safety and Efficacy of Their Fc-Mediated Effector Functions



*Amanda Gross, Associate Director, Immunology, SeromYx Systems*

Antibodies represent a rapidly expanding class of biotherapeutics, where Fc-mediated effector functions strongly influence clinical efficacy and safety. By restricting themselves to classical assays (ADCC, ADCP, CDC), current pipelines under-evaluate Fc functions elicited by other immune effectors like dendritic cells, macrophages, and granulocytes. Comprehensive Fc function profiling of established and novel antibody formats enables data-driven lead selection, optimization, and identification of clinical correlates, ultimately increasing clinical confidence.

4:10 Networking Refreshment Break

4:40 Isotopically-Labeled Carriers to Enhance Recovery Yields and Limit of Detection for siRNA Therapeutics

*Megha Chandrashekar, PhD, Senior Scientist, Amgen Inc.*

Isotopically-labeled carriers offer an approach to improve the quantification and recovery of siRNA therapeutics. This presentation explores how labeled molecules offer the potential to enhance assay sensitivity, increase recovery yields, and lower limits of detection across complex biological matrices. Case studies will demonstrate applications across various *in vitro* and *in vivo* matrices as applied to pharmacokinetic and toxicokinetic studies, highlighting how these tools accelerate development of next-generation RNA-based therapeutics.

5:10 Ultra-Rapid CAR T Development: Innovative Strategies for a 1-Day, Non-Activated Product

*Saba Ghassemi, PhD, Research Assistant Professor, Pathology & Lab Medicine, Center for Cellular Immunotherapies, University of Pennsylvania*

Ultra-rapid, non-activated CAR T manufacturing offers a paradigm shift, generating potent cell products within a single day. I will present principles underlying this streamlined workflow, approaches for product characterization, and its implications for decentralized or point-of-care deployment. This emerging platform provides

a path toward same-day engineering while maintaining product quality and translational feasibility.

## SPECIAL PRESENTATION

5:40 Analytical Control Strategies and Characterization Approaches for Co-Formulated Biologics

*Joseph Valente, Associate Scientific Director, Bristol-Myers Squibb*

This presentation highlights key industry trends for co-formulated fixed-dose combination biologic products. We address analytical and characterization challenges, focusing on how the number, identity, and ratio of combined molecules impact control strategies. Practical insights will be illustrated with case studies sourced from recent clinical trials and literature, emphasizing key questions and considerations for bringing these innovative products to patients.

6:10 Close of Day

## FRIDAY, MAY 15

7:15 am Registration Open

## INTERACTIVE ROUNDTABLE DISCUSSIONS

7:30 Interactive Roundtable Discussions with Continental Breakfast

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

TABLE 7: Current State and Future Direction of Co-formulated Biologics

*Joseph Valente, Associate Scientific Director, Bristol-Myers Squibb*

TABLE 8: Mass Photometry for Viral Vector Analysis: Challenges and Opportunities

*Anastasiia Vasiukhina-Martin, PhD, Advisor, BRD Analytical Development, Eli Lilly and Company*



## RESEARCH TOOLS AND EMERGING MODALITIES

### 8:25 Chairperson's Remarks

*Nicolle Serrano SantoDomingo, Senior Scientist, Novartis*

### 8:30 Characterization Challenges for Novel Antibody Constructs

*Laura Kingsley, Principal Scientist, Biotherapeutics, Boehringer Ingelheim*

The emergence of multispecifics and complex formats in the biologics space has led to unique challenges for characterization pipelines, especially high-throughput, small scale platforms that have been tailored to IgG discovery. This presentation will discuss limitations of high-throughput platforms in the context of multispecifics along with strategic and technical approaches to navigate these challenges. Additionally, we will discuss how carefully-selected lower throughput experiments can facilitate high-throughput outcomes.

### 9:00 Biophysical Characterization of New Modalities

*Daniela M. Tomazela, PhD, Senior Director, Protein Therapeutics, Gilead Sciences Inc.*

The development of complex molecular formats is expanding our ability to engineer biological systems and enabling new MoAs. This presentation highlights strategies for the biophysical characterization of novel molecular entities, with a focus on integrating experimental and predictive data to accelerate lead identification and molecule optimization.

### 9:30 Modeling ADCs and Bispecific Antibodies for High-Concentration Developability Prediction

*Pin-Kuang Lai, PhD, Assistant Professor, Chemical Engineering and Materials Science, Stevens Institute of Technology*

High-concentration formulations for emerging modalities such as antibody–drug conjugates (ADCs) and bispecific antibodies (bsAbs) frequently encounter viscosity and aggregation challenges that limit manufacturability and subcutaneous delivery. We present an integrated multiscale modeling framework to predict developability at elevated concentrations. This approach supports early risk assessment, reveals sequence- and domain-level determinants of undesired behavior, and guides the rational engineering and screening of next-generation ADCs and bsAbs.

### 10:00 Talk Title to be Announced

*Hannah Sheehan, Co-Founder, CEO & CSO, SauveBio*



### 10:15 Featured Poster Presentation: Establishing Reliable PK Liability Evaluation Criteria: A Validated Transcytosis Assay for Monoclonal Antibodies and Comparative Study with SCID Mouse PK

*Chang Liu, PhD, Associate Scientist, BioAnalytical Sciences, Genentech Inc.*

Aligning with the FDA's New Approach Methodologies (NAMs) initiative to replace animal studies, we optimized and validated a high-precision FcRn-dependent transcytosis assay. Demonstrating exceptional correlation with human nonspecific clearance, statistical analysis established reliable PK liability cut-off thresholds. Head-to-head comparisons reveal this human-relevant *in vitro* assay has superior predictive power compared to SCID mouse PK studies, illustrating how NAMs can replace animal models to accelerate critical biotherapeutic development decisions.

### 10:30 Networking Coffee Break

### 10:45 Bioanalytical Strategy Considerations for T Cell Engagers

*Damien Fink, PhD, Director, Oncology Integrated Bioanalysis, AstraZeneca*

Developing a bioanalytical strategy for T cell engaging (TCE) therapeutics requires coordinated evaluation of pharmacokinetics, immunogenicity, and engagement of target and effector cells. An integrated approach enables robust pharmacodynamic inputs to support PK/PD modeling and decision-making. This presentation outlines critical considerations and practical frameworks for designing comprehensive, fit-for-purpose bioanalytical strategies for TCE programs.

### 11:15 Control Strategies Tailored for Multispecifics

*Wenqin Ni, PhD, Senior Principal Scientist, Analytical Research and Development, Pfizer*

This presentation provides an overview of multispecific therapeutic development from early molecular design through clinical evaluation to commercial approval. It highlights unique quality attributes including homodimer formation and heavy/light chain mispairing, and the criticality assessment. The control strategies to mitigate these product-related impurities will be discussed. Key topics include molecule design, manufacturing process

control, specification setting, analytical method development, and characterization tools. Additionally, regulatory feedback will be discussed.

### 11:45 mRNA Lipid Nanoparticle Formulation, Characterization, and Evaluation

*Sabiruddin Mirza, PhD, Senior Research Associate, Harvard University*

Messenger RNA–lipid nanoparticle (mRNA-LNP) therapeutics have transformed modern medicine. However, achieving consistent formulation quality and rapid characterization remains a major challenge. Our microfluidic-assisted platform for precise, scalable, and reproducible mRNA–LNP formulations minimizes batch variability, accelerates process optimization, and supports regulatory-compliant manufacturing of next-generation mRNA therapeutics. This integrated microfluidic strategy provides a versatile tool for rational LNP design, paving the way toward personalized and on-demand RNA delivery systems.

### 12:15 pm Close of Summit

# IMMUNOGENICITY STREAM

## From Fundamentals to AI-Driven Prediction: Advancing Immunogenicity in Drug Development

This year's Immunogenicity Stream at PEGS Boston Summit provides a comprehensive progression from foundational principles to cutting-edge applications. The program begins with an introductory training seminar providing a practical, comprehensive overview of immunogenicity, before moving into advanced discussions on the integration of AI/ML approaches for predicting immune responses. Sessions will address the latest computational models, incorporation of multi-omics and structural data, and the use of generative AI to enhance antibody humanization and epitope prediction. Case studies will explore regulatory perspectives on *in silico* tools, strategies for reducing clinical risk, and the translation of predictive models into drug development pipelines. The stream concludes with a training seminar providing a deep dive into bioassay design, validation, and monitoring.



IMMUNOGENICITY  
STREAM  
CONFERENCES

MAY 11-12

TRAINING SEMINAR:

### Introduction to Immunogenicity

AGENDA

MAY 12-13

### Predicting Immunogenicity with AI/ML Tools

AGENDA

MAY 14-15

TRAINING SEMINAR:

### Bioassay Development and Analysis

AGENDA



MONDAY, MAY 11, 2026 8:30 AM - 6:00 PM | TUESDAY, MAY 12, 2026 8:30 AM - 12:45 PM

## Introduction to Immunogenicity

This 1.5-day training seminar provides a practical, comprehensive overview of immunogenicity—the causes, how to assess, predict, and prevent, and what to do if you observe immunogenicity during preclinical, clinical, and post-market approval. The seminar begins by detailing the science behind immunogenicity, the latest international guidance, followed by assay and bioanalytical assessment strategies for traditional and emerging biologics. Other topics include predictive models, the role of AI/ML, and reporting immunogenicity.

Instructors:



Chloé Ackaert, PhD,  
Senior Scientist,  
Immunogenicity,  
ImmunXperts, a Q2  
Solutions Company



Timothy Hickling, PhD,  
Consultant, Quasor Ltd.



Sofie Pattijn, Founder  
& CTO, ImmunXperts,  
a Q2 Solutions  
Company

### TOPICS TO BE COVERED INCLUDE:

- Part 1: Introduction to Immunology and Immunogenicity
- Part 2: Non-Clinical Immunogenicity Potential Assessment
- Part 3: Clinical Considerations of Immunogenicity and Regulatory Expectations
- Part 4: Assay Methodology and Approaches for Describing Immunogenicity in the Clinic?

Cambridge Healthtech Institute Training Seminars offer real-life case studies, problems encountered and solutions applied, and extensive coverage of the basic science underlying each topic. Experienced Training Seminar instructors offer a mix of formal lectures, interactive discussions, and activities to help attendees maximize their learning experiences. These immersive trainings will be of value to scientists from industry and academic research groups who are entering new fields—and to those working in supporting roles that will benefit from an in-depth briefing on a specific aspect of the industry.

*Training Seminars will be held in person only. To ensure a cohesive and focused learning environment, moving between conference sessions and the training seminars is not allowed.*



## SUNDAY, MAY 10

## 2:00 pm Recommended Pre-Conference Short Course

## SC4: Unlocking Immunity: Mastering Epitope Analysis and Prediction with IEDB and CEDAR Tools &amp; Insights

\*Separate registration required. See short course page for details.

## TUESDAY, MAY 12

## 1:50 pm Networking Coffee &amp; Dessert Break in the Exhibit Hall with Poster Viewing

## 2:20 Organizer's Opening Remarks

## IMMUNOGENICITY RISK ASSESSMENT DATASETS

## 2:25 Chairperson's Opening Remarks

Daniel Leventhal, PhD, Principal Consultant, Tactyl

## 2:30 A Streamlined Preclinical Workflow to Assess the Immunogenicity Risk of Biotherapeutics

Rita Martello, PhD, Scientific Director, NBE DMPK Lead & Head of External NBE DMPK Leads Clinical Activities, Merck KGaA

We have established a workflow integrating immunogenicity risk assessment with *in silico* analysis, which can trigger *in vitro* assays. This streamlined approach reduces the number of costly low-throughput *in vitro* tests and serves as a screening tool for selecting less immunogenic formats. We enhance initial immunogenicity risk assessments and develop effective mitigation strategies, safeguarding patient safety and improving therapeutic outcomes.

## 3:00 Defining the Data behind the Models: Interpreting Clinical Immunogenicity Measures for AI/ML Risk Assessment

Daniel Leventhal, PhD, Principal Consultant, Tactyl

Predicting unwanted immunogenicity remains a major challenge in biotherapeutic development. This presentation reviews molecular, mechanistic, and clinical features contributing to anti-drug antibody risk, offers guidance for interpreting public clinical immunogenicity datasets, and highlights the Immunogenicity Database Collaborative (IDC)—a community effort to standardize and structure clinical ADA data. These resources aim to enable more interpretable, multivariable models that better reflect clinical immunogenicity complexity.

## 3:30 Talk Title to be Announced

Andrew Isidoridy, Immunology Sales Specialist, Sales, ProImmune Ltd



## 4:00 Refreshment Break in the Exhibit Hall with Poster Viewing

## 4:10 Speed Networking

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

## SPEED NETWORKING

## Speed Networking: How Many New Contacts Can You Make?

Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

## IMMUNOGENICITY PROPERTY PREDICTION

## 4:40 Harnessing Human and Machine Intelligence for Next-Generation Immunogenicity Risk Prediction

Guilhem Richard, PhD, CTO, EpiVax Inc.

EpiVax has developed the ISPRI platform for assessing the immunogenic risk of biotherapeutics. New AI/ML models have been integrated into ISPRI, leading to enhanced prediction of tolerated epitopes and estimation of ADA responses. These updates improved characterization of epitopes within biotherapeutic molecules and enabled a 3-fold increase in the correlation between predicted and observed ADAs over existing approaches, with over 75% of predicted ADAs within 10% of observed values.

## 5:10 B Cell Epitope Predictions: Can We Benefit from Immune-Receptor Data?

Morten Nielsen, PhD, Professor, Department of Health Technology, Technical University of Denmark

Immunogenicity assessment is key for the development of biologics. Traditional approaches have focused on MHC Class II antigen presentation. However, recent advances in B cell epitope and antibody-antigen interaction prediction have significantly enhanced predictive capabilities. This talk will describe some of these tools and introduces AbEpiTope-1.0, tool for predicting

antibody targets, suggesting how these tools can be integrated into computational pipelines for immunogenicity assessment and de-risking of protein therapeutics.

5:40 Mapping the T Cell Receptor Specificity Landscape through *de novo* Peptide Design

Gian Marco Visani, PhD Graduate Student, University of Washington

A computational framework to predict TCR recognition of peptides presented by MHC-I and to design novel immunogenic peptides. Using HERMES, a model trained on the protein universe to predict amino acid preferences based on local structural environments, we accurately predict TCR-pMHC binding and T cell activity without task-specific training. We further design and experimentally validate *de novo* peptides that activate T cells and map peptide recognition landscapes across TCR-MHC systems.

## 6:10 Close of Day

## 6:30 Recommended Dinner Short Course

## SC6: Developability of Bispecific Antibodies

\*Separate registration required. See short course page for details.

## WEDNESDAY, MAY 13

## 8:00 am Registration Open

## PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL

## 8:25 Chairperson's Remarks

## 8:30 Innovation in Protein Science with Young-Scientist Visionaries



Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.



## Panelists:

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School

Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder

Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School

## 9:15 Coffee Break in the Exhibit Hall with Poster Viewing

## MENTORING MEET-UP

## Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship

Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

## IMMUNOGENICITY PROPERTY PREDICTION

## 10:00 Chairperson's Remarks

Sophie Tourdot, PhD, Immunogenicity Sciences Lead, Research and Development, Pfizer

## 10:05 Mapping the Anti-Drug Antibody Binding Site on Multidomain Biotherapeutics

Xiaobin Zhang, PhD, Associate Director, Takeda Pharmaceuticals  
Immunogenicity of biotherapeutics poses a significant efficacy or safety concern in drug development. It is crucial to select candidates with low immunogenicity risk or de-immunize the candidates at an early stage. In this presentation, I will introduce the tool of *in silico* prediction, domain competitive assay, and peptide screening for a multidomain therapeutics in preclinical and clinical studies. This integrated immunogenicity assessment will enhance the success ratio in drug development.

## 10:35 Improving Clinical Anti-Drug Immunogenicity Prediction with B Cell Epitopes

Will Thrift, PhD, Principal Artificial Intelligence Scientist, Genentech

We present a prototypical workflow for leveraging B cell epitope prediction, together with structural humanness assessment, to enhance immunogenicity risk evaluation for biotherapeutics. Using large clinical datasets of anti-drug antibody responses, we show that integrating B cell epitope and humanness information improves both precision and recall in immunogenicity prediction compared to T cell epitope only approaches, highlighting its potential to refine preclinical risk assessment strategies.

## 11:05 Presentation to be Announced

## 11:35 Session Break

## 11:40 Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own

## 12:10 pm Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own

## INTERACTIVE BREAKOUT DISCUSSIONS

## 12:40 Find Your Table and Meet Your Discussion Moderator

## 12:50 Interactive Roundtable Discussions

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

TABLE 11: Practical Considerations for Incorporating *In Silico* Risk Assessment and Mitigation Earlier in Drug Design

Sophie Tourdot, PhD, Immunogenicity Sciences Lead, Research and Development, Pfizer

TABLE 12: Benchmarking *In Silico* IgG and VHH Humanization Tools

Tony Pham, Senior Scientist, Biologics Engineering & Developability, AstraZeneca



## IN SILICO IMMUNO SYSTEMS MODELING

## 1:35 Chairperson's Remarks

Lora Hamuro, PhD, Senior Director, Clinical Pharmacology & Pharmacometrics, Bristol Myers Squibb

## 1:40 Evaluating the Immunogenicity Risk of Protein Therapeutics by Augmenting T Cell Epitope Prediction with Clinical Factors

Zicheng Hu, PhD, Former Principal Scientist, Genentech

Protein-based therapeutics can trigger anti-drug antibodies (ADAs) that affect pharmacokinetics, efficacy, or safety. Using Roche/Genentech clinical data, we identified factors influencing drug immunogenicity across monoclonal antibodies and other modalities. ADA incidence was linked to drug and comedication mechanisms, administration routes, and disease types. Combining these clinical factors with *in silico* epitope predictions improved the accuracy of clinical immunogenicity prediction.

## 2:10 Immune System Modeling of Immunogenicity for a Biotherapeutic Combination

Lora Hamuro, PhD, Senior Director, Clinical Pharmacology & Pharmacometrics, Bristol Myers Squibb

This seminar presents quantitative systems pharmacology modeling of immunogenicity for biotherapeutic combinations, focusing on nivolumab and ipilimumab. The model showed that combining these agents increases nivolumab anti-drug antibodies compared to monotherapy but does not significantly alter pharmacokinetics, consistent with clinical data. This mechanistic approach to understanding immunogenicity can be applied to other biotherapeutic combinations.

2:40 IGMotifFinder: Improving Preclinical *in silico* Immunogenicity Assessment via Integration of Pathogen Similarity Analysis

Brunno Rocha, PhD, Data Science Innovation Postdoctoral Fellow, Bioinformatics and Biotherapeutic Modeling, Novartis

Biotherapeutics may include motifs similar or identical to pathogenic sequences, acting as cross-reactive T cell epitopes that increase immunogenicity potential. IGMotifFinder is an *in silico* platform developed to identify HLA class II-presented cross-reactive motifs. Analysis of over 200 biotherapeutics revealed that a higher "pathogenic" to "self" motif-ratio correlates with increased clinical immunogenicity. IGMotifFinder will support early identification and proactive mitigation of immunogenicity in biotherapeutics.

**3:10 Mitigation of Immunogenicity During Drug Design**

Christina Fu, PhD, Senior Principle Scientist, PDM, Pfizer

**3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing****INTEGRATING IN SILICO IMMUNOGENICITY AND DEVELOPABILITY ASSESSMENTS****4:20 KEYNOTE PRESENTATION: Generalized Multi-Objective Optimization Methods for the Design and Engineering of Low-Immunogenicity Protein Therapeutics**

Ryan Peckner, PhD, Director, Machine Learning, Seismic Therapeutic

We develop machine learning models to simultaneously optimize multiple drug-like properties of biologics, including antibodies and enzymes. Our generative models that harness both the design of functional proteins and the prediction of drug-like properties to engineer therapeutically developable proteins with low immunogenicity. We produce and experimentally characterize these designs for fitness, function, and developability, exploring the synergy of these methods in a generalized multi-objective optimization pipeline for biologics.

**4:50 Discovery to Development: Computational Approaches for Immunogenicity De-Risking**

Priyanka Gupta, PhD, Principal Scientist, Biotherapeutics, Boehringer Ingelheim Pharmaceuticals, Inc.

Molecular sequence is a key contributor to immunogenic responses against biologic drugs. Leveraging *in silico* techniques enables early identification and mitigation of sequence-associated risks during the discovery phase, in a high-throughput and efficient manner. This presentation will highlight computational strategies that integrate a suite of *in silico* tools to optimize lead molecules for developability and reduce immunogenicity risk—ultimately accelerating the path to candidate selection.

**APPLYING AI STRATEGIES TO NEW MODALITIES****5:20 Immunovate: A Design-Focused Approach to Minimizing Immunogenicity with ML**

Frank Teets, PhD, Head, Computational Science, AI Proteins

*In silico* predictions of immunogenicity have long been a grand challenge in the design of polypeptide therapeutics. While a complete solution remains difficult, the power of novel *de novo* design methods can be coupled with ML methods to produce an automated, general solution for minimizing unwanted immunogenicity in *de novo* designed miniproteins. We present Immunovate, a lightweight solution for controlling miniprotein immunogenicity at several levels of simulation complexity.

**IMMUNOGENICITY PROPERTY PREDICTION****5:50 From HLA Class II Peptide Presentation to Immunogenicity Screening of Therapeutic Antibodies with HLAIIPred**

Mojtaba Haghighatlari, PhD, Senior Principal Machine Learning Scientist, Pfizer Inc.

HLAIIPred is an end-to-end and context-free deep learning model that predicts HLAII-presented peptides on the surface of antigen presenting cells. In this presentation, the design methodologies integrated with HLAIIPred will be highlighted, providing important insights into peptide-HLAII interactions through the identification of core peptide residues. Additionally, screening strategies are discussed for predicting unwanted immunogenic segments in therapeutic antibodies using HLAII presentation models.

**6:20 Networking Reception in the Exhibit Hall with Poster Viewing****7:20 Close of Predicting Immunogenicity with AI/ML Tools Conference**



THURSDAY, MAY 14, 2026 8:30 AM - 5:40 PM | FRIDAY, MAY 15, 2026 8:30 AM - 12:15 PM

## Bioassay Development and Analysis

This course will focus on factors to be considered in the design, development, and validation of bioassays. The course introduces terminology and important statistical tools and best practices. Examples and case studies will be provided to help solidify understanding on the topics of design and development, robustness, validation, and post-validation. Relevant pharmacopeial and EUA regulations will be highlighted.



*Instructor: Steven Walfish, Owner,  
Statistical Outsourcing Services*

### KEY TOPICS

- Introduction to Bioassays
- Guidance Documents on Bioassays
- Design & Development
- Robustness Validation & Post Validation
- Statistical Analysis Models
- Examples/Case Studies

Cambridge Healthtech Institute Training Seminars offer real-life case studies, problems encountered and solutions applied, and extensive coverage of the basic science underlying each topic. Experienced Training Seminar instructors offer a mix of formal lectures, interactive discussions, and activities to help attendees maximize their learning experiences. These immersive trainings will be of value to scientists from industry and academic research groups who are entering new fields—and to those working in supporting roles that will benefit from an in-depth briefing on a specific aspect of the industry.

*Training Seminars will be held in person only. To ensure a cohesive and focused learning environment, moving between conference sessions and the training seminars is not allowed.*



# EMERGING THERAPEUTICS STREAM

## Emerging and Innovative Biotherapeutics to Address Unmet Medical Needs

The Emerging Therapeutics Stream at the PEGS Boston Summit brings together three dynamic programs showcasing the diversity of approaches driving the next generation of drug innovation. **Biologics for Autoimmune Diseases** will highlight novel strategies across musculoskeletal, skin, and gut disorders, alongside cutting-edge modalities and translational tools that are reshaping treatment possibilities for complex immune-mediated conditions. **Radiopharmaceutical Therapies** will showcase the latest advances driving this rapidly expanding field, from novel targets and isotope selection, to dosimetry and next generation theranostic advances revolutionizing patient care. And the new **Emerging Peptide Therapeutics** track will spotlight the revival of peptide drug discovery, featuring advances in engineering, design, and therapeutic applications including half-life extended peptides and GLP-1 agonists. Together, these programs offer a comprehensive view of the therapeutic innovations poised to change patient care.



EMERGING THERAPEUTICS  
STREAM CONFERENCES

MAY 11-12

## Biologics for Autoimmune Diseases

AGENDA

MAY 12-13

## Frontiers in Radiopharmaceutical Therapy

AGENDA

MAY 14-15

## NEW—Emerging Peptide Therapeutics

AGENDA

**SUNDAY, MAY 10****2:00 pm Recommended Pre-Conference Short Course****SC3: Challenges and Opportunities in Solid Tumor and Autoimmune Disease Therapeutics**

\*Separate registration required. See short course page for details.

**MONDAY, MAY 11****7:00 am Registration and Morning Coffee****8:20 Organizer's Opening Remarks****TARGETING MAJOR ORGAN SYSTEMS****8:25 Chairperson's Remarks***Ahuva Nissim, PhD, Professor Emeritus, Antibody and Therapeutic Engineering, William Harvey Research Institute, Queen Mary University of London***8:30 Antibody-Based AAV Retargeting for Enhanced Skeletal Muscle Transduction***Tri Nguyen, PhD, Principal Scientist, Alternative Format and Antibody Engineering, Regeneron*

The use of adeno-associated virus (AAV) for gene therapy delivery shows significant potential in treating various muscle diseases. We have developed a bispecific antibody that binds to AAVs and retargets them to skeletal muscles via a skeletal muscle-specific protein. This approach enables enhanced AAV transduction in skeletal muscles while greatly reducing off-target transduction in other tissues.

**9:00 Trispecific Antibodies for Atopic Dermatitis and Other Disorders***Laird Bloom, Senior Director, BioMedicine Design, Pfizer Inc.*

Monospecific therapeutics in inflammatory indications often are limited in their efficacy, while blockade of multiple pathways may enhance efficacy and benefit to patients. We describe design and engineering of PF-07275315 and PF-07264660, trispecific antibodies currently in Phase 2 studies in atopic dermatitis and other indications. These antibodies combine mechanisms with demonstrated efficacy across a range of atopic and inflammatory conditions by simultaneously neutralizing IL-4, IL-13, and TSLP or IL-33.

**9:30 Novel Tolerogenic Biologics for Chronic Inflammatory Diseases***Tangsheng Yi, PhD, Senior Director, Inflammation Biology and Immunology Discovery, Gilead Sciences*

Tolerogenic cytokines play an essential role in regulating immune responses and controlling aberrant immune activation. However, natural recombinant cytokines exhibit undesirable drug-like properties with short half-lives and toxicity. Here, we describe the design and engineering of cytokine-agonistic antibodies for the treatment of autoimmune inflammation.

**10:00 Antibody-LNP Platforms for Cell-Specific Delivery in Autoimmune Disease***Bradley Delaney, Manager, Business Development, Nona Biosciences***10:15 Selective Clearance of Pathogenic Autoantibodies via FcγRIIB-Targeting Fc Fusions***Allan Capili, PhD, Senior Director, Biologics, Merida Biosciences*

Current treatments for antibody-mediated autoimmune diseases rely on broad immunosuppression or nonselective IgG depletion, leaving patients vulnerable to infection without durable remission. We report a modular Fc-fusion platform that selectively clears pathogenic autoantibodies while sparing total IgG. The platform neutralizes autoantibodies and facilitates avidity-mediated clearance via the inhibitory receptor FcγRIIB expressed on LSECs. Validation using a TSHR-Fc construct for Graves' disease demonstrated rapid, receptor-dependent autoantibody depletion in humanized mice models.

**10:30 Networking Coffee Break****11:00 Engineering Therapies to Restore Antigen-Specific Immune Tolerance in Autoimmune Disease***Brittany Hartwell, PhD, Assistant Professor, Biomedical Engineering, University of Minnesota*

Most current autoimmune therapies act through nonspecific suppression of the immune response, leading to global immunosuppression and deleterious off-target effects for patients. Antigen-specific immunotherapies are needed that restore selective immune tolerance against the offending autoantigen and autoreactive cells. Here, we present engineering strategies to restore antigen-specific tolerance in autoimmune diseases like multiple sclerosis, using protein engineering combined with targeted drug delivery to create molecular platforms with tunable kinetics.

**11:30 Gaps and Progress in Crohn's Disease, Ulcerative Colitis, and IBD***Mary E. Keir, PhD, Distinguished Scientist, Immunology Diagnostic Discovery, Genentech Inc.*

Significant progress in inflammatory bowel disease (IBD) over the last two decades has yielded approved biologic and small-molecule therapies targeting inflammatory cytokines (TNF-alpha, IL-23) and leukocyte trafficking. Despite this, the majority of IBD patients fail to achieve long-term durable remission in response to therapy and predictive biomarkers are lacking. Patients are often diagnosed at a young age, and achieving personalized medicine and a definitive cure remains the primary goal.

**12:00 pm Session Break****12:10 Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own****12:40 Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own****1:10 Session Break****RESEARCH TOOLS AND MODELS****1:15 Chairperson's Remarks***Tangsheng Yi, PhD, Senior Director, Inflammation Biology and Immunology Discovery, Gilead Sciences***1:20 Rapid, Deep Depletion of Autoantibodies by an Engineered IgG Protease for Acute and Chronic Disease Management***Erik Procko, PhD, CSO, Cyrus Biotechnology; Adjunct Professor, University of Illinois, Urbana*

IgG proteases may bridge short-term crisis management with long-term reduction of autoantibodies for broadly treating autoimmune diseases. IgG proteases can catalyze >99% degradation of IgG in minutes *in vivo* at catalytic doses, including degradation of autoantibodies already bound to antigen. CYR212 is an engineered protease, modified using AI and rational design, for best-in-class properties. Long PK-PD, low immunogenicity, and fast recovery from antibody-mediated disease are demonstrated in animal models.

**1:50 Advances in Predicting Treatment Response to Biologics in RA**

*Myles Lewis, PhD, Professor, Centre for Experimental Medicine & Rheumatology, William Harvey Research Institute, Queen Mary University of London*

Accurately predicting treatment response to biologics in rheumatoid arthritis is essential for improving outcomes and reducing trial-and-error prescribing. This talk will review recent advances in multi-omics profiling, machine-learning models, and clinical biomarkers that enable earlier identification of likely responders. Case studies will illustrate how integrating molecular signatures with real-world data can refine patient stratification and guide development of next-generation targeted therapies for RA.

**2:20 KEYNOTE PRESENTATION: Induced Proximity Strategies for Treatment of Autoimmune Diseases**

*Scott Lesley, PhD, President and CSO, InduPro; former Vice President, Discovery Biologics, Merck*

Signaling biology is driven by the local environment of proteins on the cell surface. Through its Membrane INTeractomics platform (MINT), InduPro has defined the proximity landscape of the immune synapse. We have created immune signaling agonists and antagonists using bispecific antibodies to recruit proteins to, or sequester proteins from this unique signaling environment. These novel targeting strategies represent a new paradigm for disease intervention by defining and manipulating protein proximity.

**2:50 Reprogramming Protein Therapeutics to Restore Immune Balance in Animal Models of Autoimmunity**

*Masha Fridkis-Hareli, PhD, Founder and CEO, Palena Therapeutics, Inc*

This presentation advances a novel protein platform toward safer, precision treatments for autoimmune and inflammatory diseases. By leveraging embedded epitope random copolymer proteins, this approach reprograms immunity without suppressing healthy immune responses. Disease-specific efficacy is demonstrated across multiple animal models, including multiple sclerosis, rheumatoid arthritis, and Crohn's disease.

**3:20 Networking Coffee & Refreshment Break****4:05 Transition to Plenary Keynote Session****PLENARY KEYNOTE****4:15 Plenary Keynote Introduction**

*G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company*

**4:25 CARs 2026: New Models and New Runways**

*Michel Sadelain, MD, PhD, Director, Columbia University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center*

T cell engineering holds great promise for the treatment of cancers and other pathologies. The original chimeric antigen receptor (CAR) prototypes targeting CD19 are now giving way to further refined receptors endowed with greater sensitivity and combinatorial possibilities. Emerging new targets and engineering tools augur favorably for broadening the use of CAR therapies.

**YOUNG SCIENTIST KEYNOTE****5:10 Deep Learning-Based Binder Design to Probe Biology**

*Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich*

Protein-protein interactions are central to biology and drug discovery, yet traditional antibody generation is slow and costly. BindCraft is an open-source, automated computational pipeline for *de novo* protein binder design that routinely yields nanomolar binders with 10-100% experimental success, without high-throughput screening or maturation. We illustrate applications to peptides, cell-surface receptors, allergens, and gene editors, and outline how deep-learning workflows can accelerate next-generation therapeutics, diagnostics, and bioprocessing.ion in the Exhibit Hall with Poster Viewing

**5:55 Welcome Reception in the Exhibit Hall with Poster Viewing****YOUNG SCIENTIST MEET-UP****Young Scientist Meet-Up**

*Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University*

*Gian Marco Visani, PhD Graduate Student, University of Washington*

*Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology*

This young scientist meet-up is an opportunity to get to know and network with mentors of the PEGS community. This session aims to inspire the next generation of young scientists by giving direct access to established leaders in the field.

- Get to know fellow peers and colleagues
- Make connections and network with other institutions
- Discuss the role of mentors and peers role models in the field

**7:15 Close of Day****TUESDAY, MAY 12****7:45 am Registration and Morning Coffee****EMERGING AUTOIMMUNE INDICATIONS****8:30 Chairperson's Remarks**

*Matthew J. Bernett, PhD, Executive Director, Protein & Antibody Engineering, Xencor*

**8:35 Reprogramming Autoimmunity: Designing a Smarter Checkpoint Receptor Agonist**

*Daniela Cipolletta, PhD, Senior Director, Immunology, Seismic Therapeutic*

S-4321 is a novel dual-cell bidirectional agonist that selectively binds and signals through the inhibitory receptors PD-1 and Fc $\beta$ RIIb at the synapse between a T cell and an antigen-presenting cell. Unlike first-generation PD-1 depleters, S-4321 has the potential to restore immune homeostasis without causing loss of PD-1 expression on T cells, induction of proinflammatory cytokines, or depletion of PD-1+ Tregs.

**9:05 Emerging Diagnostic and Treatment Strategies for T1D**

*Amelia Linnemann, PhD, Associate Professor, Pediatrics, Indiana University School of Medicine*

*Ahuva Nissim, PhD, Professor Emeritus, Antibody and Therapeutic Engineering, William Harvey Research Institute, Queen Mary University of London*

In Type 1 diabetes (T1D) oxidized insulin (oxPTM-INS) can be detected even before the clinical onset. Antibody response to oxPTM-INS neoepitope peptides (oxPTM-INSPs) and stimulate humoral and T cell responses in T1D. Biased human antibody library from T1D donors raised specific oxPTM-INS antibodies. Selected mAbs bind specifically to inflamed islet and may have a significant impact on the treatment of T1D.

**9:35 Autoantigen-Drug Conjugates for Targeted Autoimmune Therapy**

*Grant Downes, PhD, Venture Fellow, BioGenerator Ventures; Former Postdoctoral Researcher, University of Kansas*

Autoimmune diseases often involve a repertoire of autoantigens as drivers of disease. However, a single autoantigen or small subset can drive immune responses, particularly at early stages of disease. Autoantigen-drug conjugates aim to selectively cull or re-educate the offending autoimmune cells. Our approaches to link autoantigen to various drugs will be presented and our work in Type 1 diabetes will be emphasized.

**10:05 Redesigning Antibody Discovery: How Modular DNA Synthesis Unlocks Smarter, Faster Engineering Workflows**

*David Weiss, Senior Director, Marketing and Product, Marketing, Telesis Bio*

Antibody engineering has advanced—but DNA synthesis hasn't kept up. Gibson SOLA introduces modular, enzymatic "Intelligent

Synthesis," enabling rapid, on-demand creation of hundreds of antibody variants. Reduce full-length constructs, increase screening depth, and eliminate outsourcing delays. From scFv to Fc-fusions, SOLA drives faster iteration, higher throughput, and more efficient discovery—at equal or lower cost.

**10:35 Coffee Break in the Exhibit Hall with Poster Viewing****T CELL ENGINEERING TO REDIRECT AND REGULATE IMMUNITY****11:15 Advancing T Cell Engagers for Autoimmune Disease: Insights from CD19×CD3, CD20×CD3, and IL2RG-Directed Bispecifics**

*Matthew J. Bennett, PhD, Executive Director, Protein & Antibody Engineering, Xencor*

Xencor is advancing a portfolio of bispecific antibodies designed to restore immune balance in autoimmune disease. We will share translational data from XmAb657 (CD19×CD3), which achieves potent, sustained depletion of B-lineage cells in tissues after a single dose, plamotamab (CD20×CD3) transitioning from oncology to autoimmunity, and a novel IL2RG-directed bispecific that modulates  $\gamma$ c cytokine pathways to temper autoreactive T cell activity. These programs highlight versatile engineering approaches to immune modulation.

**11:45 Advancing CAR-Tregs for Autoimmune and Transplant Applications**

*Leonardo M. R. Ferreira, PhD, Assistant Professor, Pharmacology and Immunology, Medical University of South Carolina*

Regulatory T cells (Tregs) can modulate the immune system with antigen specificity in transplant rejection and autoimmunity. Synthetic biology can impart any desired specificity to Tregs. We are co-engineering pluripotent stem cells and Tregs such that chimeric

antigen receptor (CAR) Tregs protect CAR target-expressing hPSC-derived beta cells from immune attack in humanized mice. Moreover, we modified Tregs with a chimeric anti-HLA antibody receptor (CHAR) to specifically inhibit alloreactive B cells.

**12:15 pm Presentation to be Announced****12:30 Attend Alternate Presentation****12:45 Session Break**

**12:50 Luncheon Presentation** (*Sponsorship Opportunity Available*) or **Enjoy Lunch on Your Own**

**1:20 Luncheon Presentation** (*Sponsorship Opportunity Available*) or **Enjoy Lunch on Your Own**

**1:50 Close of Biologics for Autoimmune Diseases Conference****6:30 Recommended Dinner Short Course**

**SC7: Targeting the Target: Aligning Target and Biologic Format Biology to Achieve Desired Outcomes**

\*Separate registration required. See short course page for details.



**TUESDAY, MAY 12**

1:50 pm Networking Coffee & Dessert Break in the Exhibit Hall with Poster Viewing

2:20 Organizer's Opening Remarks

**ADDRESSING THE UNMET NEEDS AND NOVEL APPLICATIONS IN RADIOPHARM THERAPY**

2:25 Chairperson's Remarks

Joseph Vacca, Vice President & General Partner, Radiopharmaceuticals, Perceptive Imaging

**2:30 KEYNOTE PRESENTATION: Novel Applications in Radiopharmaceutical Therapy: Routes of Delivery and Therapeutic Combinations**

Zachary S. Morris, PhD, MD, Department Chair and Endowed Professor of Human Oncology, University of Wisconsin Madison

This talk will highlight preclinical evidence supporting the clinical translation of next-generation therapeutic approaches that investigate novel routes of delivery for radiopharmaceuticals and innovative combination therapy approaches to maximize treatment effect while minimizing associated side effects. Intrathecal approaches to radiopharmaceutical delivery for leptomeningeal disease and combinations with immunotherapies will be discussed to illustrate the exciting potential in this emerging frontier of oncology.

3:00 What are the Unmet Needs in Radiopharmaceutical Therapy?

Elcin Zan, MD, Chair, Division of Nuclear Medicine, Cleveland Clinic  
Radiopharmaceutical trials, which involve developing and testing agents that combine radioactive isotopes with targeting molecules for diagnostic imaging or targeted radionuclide therapy (e.g., in oncology), face several persistent challenges. These unmet needs span logistical, regulatory, biological, and equity-related domains, hindering efficient trial execution, patient access, and broader therapeutic impact.

3:30 Using Physics to Optimize Dosing of Radiopharmaceutical Therapy

Nathaniel Scott, MPhys, MSc, MPE, Medical Physicist, Blue Earth Therapeutics

Radiopharmaceutical therapy uniquely brings together drug delivery and radiation physics, but optimization goes beyond just measurement of "dose." From understanding biodistribution to modeling and trial design, physics offers ways to directly inform and influence development. By focusing on interpretation and implication, rather than measurement alone, physics can play a broader role in shaping the development of future radiopharmaceutical therapies.

4:00 Refreshment Break in the Exhibit Hall with Poster Viewing

4:10 Speed Networking

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

**SPEED NETWORKING**

**Speed Networking: How Many New Contacts Can You Make?**

Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

**DOSIMETRY AND TREATMENT PLANNING**

4:40 Advancing Radiopharmaceutical Therapy through Quantitative Digital Autoradiography

Brian W. Miller, PhD, Associate Professor, Radiation Oncology, College of Medicine, University of Arizona

Radiopharmaceutical therapy (RPT) shows promise for cancer treatment, but challenges in dose delivery and off-target effects remain. Quantitative digital autoradiography provides real-time visualization of radiopharmaceutical distribution in *ex vivo* tissue sections, improving the assessment of alpha/beta therapies. This approach is crucial for evaluating micro-scale dose estimates in tumors and normal organs. It enables evaluation of combination

alpha/beta therapies and validating the biological equivalence of alpha RPT and PET theranostic surrogates.

5:10 PANEL DISCUSSION: Dose Wars: The Phantom Voxel vs. the Return of MIRD

Moderator: Sean Carlin, PhD, Vice President, Translational Sciences, Abdera Therapeutics

Focus of the panel will be to discuss the pros and cons to the different methods and views on the future of dosimetry.

- Are we headed toward Voxel-based methods?
- Are we headed toward individual dosimetry treatment plans?
- What will be needed to get us there?
- What realistic timeframe are we looking at?

Panelists:

Eric C. Frey, PhD, Co-Founder and Chief Science Officer, Radiopharmaceutical Imaging and Dosimetry, Radiopharmaceutical Imaging and Dosimetry (Rapid), LLC

Eileen Sneed, PhD, Head, Nuclear Oncology Physics and Radiation Biophysics, RayzeBio, a Bristol Myers Squibb company

Joseph A O'Donoghue, PhD, Attending Physicist, Memorial Sloan Kettering Cancer Center

Joseph Petrulli, Dir, Image Analysis, Perceptive Inc

6:10 Close of Day

6:30 Recommended Dinner Short Course

SC8: The Dark Proteome: Unlocking Novel Targets for Next-Generation Biologics

\*Separate registration required. See short course page for details.

**WEDNESDAY, MAY 13**

8:00 am Registration Open

**PEGS YOUNG SCIENTIST  
KEYNOTE ALUMNI PANEL**

8:25 Chairperson's Remarks

8:30 Innovation in Protein Science with Young-  
Scientist Visionaries

Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.

Panelists:

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School

Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder

Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School

9:15 Coffee Break in the Exhibit Hall with Poster Viewing

**MENTORING MEET-UP****Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship**

Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

**RADIOPHARMACEUTICALS VS. ADCs**

10:00 Chairperson's Remarks

Joseph Vacca, Vice President & General Partner, Radiopharmaceuticals, Perceptive Imaging

**10:05 KEYNOTE PRESENTATION:****Radiopharmaceuticals: The Next Generation of ADCs or a Completely Different Technology?**

Geoffrey B. Johnson, MD, PhD, Physician, Nuclear Medicine, Mayo Clinic Comprehensive Cancer Care

**10:35 PANEL DISCUSSION: Radiopharmaceuticals vs. ADCs: Competition or Convergence? Finding the Real Opportunity in Precision Oncology**

Moderator: Anna M. Wu, PhD, Chair and Professor, Immunology & Theranostics, Center for Theranostic Studies, City of Hope

- Optimal target characteristics for either/both
- Optimal antibody characteristics for either/both—Affinity, internalization, linker design
- Advantages/challenges for both platforms
- Potential for combining RPT and ADC—Imaging to assess target expression. Imaging to assess actual delivery of ADC
- Combining RPT/ADC on a single antibody?

Panelists:

Geoffrey B. Johnson, MD, PhD, Physician, Nuclear Medicine, Mayo Clinic Comprehensive Cancer Care

Sherin Al-Safadi, PhD, Vice President, Medical & Corporate Affairs, Radiopharm Theranostics

Paul Schaffer, PhD, SVP, R&D, Telix Pharmaceuticals Ltd.

11:35 Session Break

11:40 Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own

12:10 pm Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own

**INTERACTIVE BREAKOUT DISCUSSIONS**

12:40 Find Your Table and Meet Your Discussion Moderator

12:50 Interactive Roundtable Discussions

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

**NOVEL PLATFORMS AND PRECLINICAL-TO-CLINICAL STRATEGIES**

1:35 Chairperson's Remarks

Elcin Zan, MD, Chair, Division of Nuclear Medicine, Cleveland Clinic

**1:40 Driving Durable Tumor Retention Through Covalent Strategies: Insights from FAP Targeting**

Andreas Goutopoulos, PhD, CEO & Co Founder, Actithera

Small molecules and peptides offer advantages over larger biologics for radiopharmaceutical delivery, including rapid tumor penetration and fast systemic clearance. However, their limited tumor residence time can restrict therapeutic efficacy. We report a covalent targeting strategy to prolong tumor retention, demonstrated in a case study of FAP-directed theranostic agents, highlighting covalency as a promising approach to enhance radioligand performance.

**2:10 Designing Radioligands for Clinical Impact: Principles Shaping Therapeutic Performance**

John Babich, PhD, Co-Founder, Ratio Therapeutics

Radioligand therapy is rapidly advancing toward the clinic, driven by recent approvals that highlight its therapeutic promise. Advancing next-generation agents demands rigorous application of principles that govern target engagement, radionuclide selection, stability, and safety. This presentation will focus on the foundational considerations that shape clinical performance, emphasizing how molecular design influences successful patient outcomes in diverse cancer therapeutic settings today.

**2:40 Advancing Radio-DARPin Therapeutics: From Preclinical Insights to Clinical Development**

*Christian Reichen, PhD, Director, Oncology Research, Molecular Partners AG*

DARPinS are promising small-sized protein-based delivery vectors for radiopharmaceutical for targeted cancer therapy. This presentation summarizes preclinical strategies to advance Radio-DARPin Therapeutics (RDT) toward clinical evaluation, focusing on improving tumor uptake and minimizing kidney exposure for optimized therapeutic windows. Initial patient images from a compassionate care program with MP0712, our DLL3-targeting lead RDT candidate show selective uptake in primary and metastatic SCLC lesions providing first-in-human proof-of-concept for RDTs.

**3:10 Lead Optimization: TRPV6-Targeted Radioligand Therapy**

*Michael Groaning, PhD, CSO, Soricimed Biopharma Inc.*

Multiple candidates targeting Transient Receptor Potential-Vanilloid Six (TRPV6)—were explored *in vivo* and *in vitro* using a proprietary peptide backbone to identify top leads for radioligand therapy. This lead optimization journey will be presented.

**3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing****NEXT-GENERATION RADIOTHERANOSTICS****4:15 Chairperson's Remarks**

*Anna M. Wu, PhD, Chair and Professor, Immunology & Theranostics, Center for Theranostic Studies, City of Hope*

**4:20 Radiotheranostics Redefined: New Targets, Broader Indications, and Next-Gen Clinical-Trial Frameworks**

*Sherin Al-Safadi, PhD, Vice President, Medical & Corporate Affairs, Radiopharm Theranostics*

Radiotheranostics are advancing beyond traditional targets and tumor types through the integration of novel ligands, promising new radionuclides, and imaging-biomarker strategies. This talk will discuss innovative clinical-trial frameworks tailored for radiopharmaceuticals, emphasizing adaptive designs, dosimetry-informed endpoints, and multidisciplinary collaboration. Key themes include radionuclide selection and supply, novel targeting vectors, theranostic pair development, and strategies to seamlessly bridge preclinical and clinical research, accelerating the translation of radiotherapeutics into effective patient care.

**4:50 The Novel Theranostic Pair Cu-61/67 Has the Potential to Offer Clinical Advantages in Several Indications**

*Ben Pais, MD, CMO, Nuclidium AG*

**5:20 PreTarg-it®: A Modular Pretargeting Architecture Enabling Next-Generation Radiotheranostics for Increased Therapeutic Windows**

*Michael Thiele, PhD, Founder & CSO, Biology Research, OncoOne R&D GmbH*

PreTarg-it® is OncoOne's modular pretargeting platform designed to expand therapeutic windows in radioligand therapies by decoupling tumor targeting from radiopeptide administration. Biodistribution and pharmacokinetic data demonstrate high tumor-to-background ratios, supported by proof-of-concept efficacy findings in preclinical tumor models. These results position PreTarg-it as a next-generation strategy for safer, more effective radiotheranostics and outline its path toward clinical translation.

**5:50 2K015, a Novel Nectin4-Targeting Peptide Radioligand with High Tumor Retention: Preclinical and Human IIT Study Evaluation**

*Weiliang (Timo) Xu, PhD, Associate Director, Business Development, Zonsen Peplib Biotech*

2K015 is a novel Nectin-4-targeting peptide radioligand with pM binding affinity, demonstrating strong tumor uptake and an improved biodistribution profile versus 68Ga-BT8009 from Bicycle Therapeutics in SW780-Nectin4 CDX models. Importantly, in a human IIT (n=3), 68Ga-2K015 achieved clear tumor imaging with low liver and kidney uptake, supporting strong translational potential for clinical development.

**6:20 Networking Reception in the Exhibit Hall with Poster Viewing****7:20 Close of Frontiers in Radiopharmaceutical Therapy Conference**



## TUESDAY, MAY 12

6:30 pm Recommended Dinner Short Course

**SC7: Targeting the Target: Aligning Target and Biologic Format Biology to Achieve Desired Outcomes**

\*Separate registration required. See short course page for details.

## THURSDAY, MAY 14

7:30 am Registration Open

**7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast**

*Moderator: Catharine Smith, Executive Director, Termeer Foundation*

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

*Panelists:*

*Natalie Galant, PhD, CEO, Paradox Immunotherapeutics*

*Noor Jailkhani, PhD, CEO & Co-Founder, Matrisome Bio*

8:30 Transition to Sessions

8:40 Organizer's Remarks

## EMERGING STRATEGIES FOR THE DISCOVERY, DESIGN, AND DELIVERY OF THERAPEUTIC PEPTIDES

8:45 Chairperson's Remarks

*Sasha B. Ebrahimi, PhD, Scientific Leader, Emerging Drug Delivery Platforms, GlaxoSmithKline*



### 8:50 FEATURED PRESENTATION: Peptide Therapeutics in Tissue Regeneration and Disease: Agonist and Antagonist Strategies

*Rami N. Hannoush, PhD, Venture Partner, Versant Ventures; former Group Leader, Early Discovery Biochemistry, Genentech, Inc.*

This talk will present a peptide drug discovery platform for generating *de novo* binders that modulate signaling pathways of therapeutic interest. We identified disulfide-constrained peptides that enhance Wnt signaling by regulating ZNRF3, an E3 ligase controlling Wnt cell surface receptor abundance. Beyond the scientific insights, the approach underscores the

translational potential of peptides as a modality to unlock previously undruggable pathways and accelerate therapeutic development across multiple disease areas.

### 9:20 Repurposing Graspertide Synthetase to Make Cyclic Peptides

*A. James Link, PhD, Professor, Chemical & Biological Engineering, Princeton University*

Cyclic peptides are exciting new lead molecules for therapeutics. Graspertides are a class of RiPPs—ribosomally synthesized natural products—that harbor macrocyclic structures. I will describe our work on graspertide discovery, focusing on the biosynthesis of the graspertide fuscimiditide. Then, I will discuss how the key enzyme in fuscimiditide biosynthesis can be repurposed to cyclize short peptides with an arbitrary sequence, allowing for the construction of cyclic peptide libraries.

### 9:50 Utilizing Bioinformatics, Biocatalysis, and Synthetic Chemistry to Access Natural Product-Inspired Peptides

*Elizabeth I. Parkinson, PhD, Associate Professor, James Tarpo Jr. and Margaret Tarpo, Department of Chemistry, Borch Department of Medicinal Chemistry and Molecular Pharmacology, Purdue University*

Cyclic peptides from soil-dwelling bacteria are a bountiful source of bioactive molecules, and the biosynthetic enzymes that produce them perform unique chemistries. Unfortunately, many biosynthetic gene clusters (BGCs) are cryptic. Herein, we are using bioinformatics predictions followed by direct chemical synthesis to access natural product-inspired cyclic peptides from cryptic BGCs followed by exploration of their bioactivities. Additionally, we have discovered biosynthetic enzymes capable of catalyzing cyclization of strained cyclic peptides.

### 10:20 OmniUltra: A Dual-Modality *in vivo* Discovery Platform for Novel Human Antibodies and Peptides



*Yasmina Abdiche, PhD, Senior Vice President, Exploratory Research, OmniAb*

OmniUltra is a dual modality *in vivo* discovery platform that generates human antibodies with ultralong CDRH3 “knob” domains potentially capable of accessing deep epitope clefts beyond the reach of traditional antibodies. Knobs can also function as autonomous structured peptides known as picobodies. By delivering inherent specificity, affinity, and stability, the OmniUltra knob scaffold may enable versatile applications across radioligand, multispecific, CAR T, and peptide therapeutics.

10:50 Coffee Break in the Exhibit Hall with Poster Viewing

## ENTREPRENEUR MEET-UP

**Fostering Entrepreneurship and Models for Start-Ups**

*Natalie Galant, PhD, CEO, Paradox Immunotherapeutics*

*Catharine Smith, Executive Director, Termeer Foundation*

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

## PLENARY FIRESIDE CHAT



**11:35 Plenary Fireside Chat Introduction**

*Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.*

**11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience**



*Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation*

The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

*Panelists:*

*Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.*

*Rebecca Croasdale-Wood, PhD, Senior Director, Augmented Biologics Discovery & Design, Biologics Engineering, Oncology, AstraZeneca*

*Joshua Meier, Co-Founder & CEO, Chai Discovery*

*Maria Wendt, PhD, Global Head (Vice President) of Digital and*



*Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi*

**12:35 pm Networking Luncheon in the Exhibit Hall and Last Chance for Poster Viewing**



**2:10 KEYNOTE PRESENTATION:  
Programmable Peptide Medicines: Design, Durability, and *In Situ* Repair**

*Krishna Kumar, PhD, Robinson Professor of Chemistry, Tufts University*

Peptide therapeutics are moving from fragile drugs to programmable, durable medicines. We will discuss broadly applicable design rules for building enzyme-resistant yet fully active peptides, show how minimal chemical edits reshape pharmacology and *in vivo* performance, and highlight a new small-molecule-mediated “repair” strategy that restores damaged peptides on demand, offering a general platform to extend the lifetime and impact of peptide drugs.

**2:40 Advances in Peptide-Based Therapeutics: Design, Applications, and Delivery**

*Annette Bak, PhD, Head, Advanced Drug Delivery, AstraZeneca*

Therapeutic peptides offer unique advantages over small molecules but face delivery challenges. This talk highlights advances in peptide drug conjugates (PDCs) as targeting ligands and carriers for cytotoxics, radionuclides, and oligonucleotides. It also covers long-acting injectables like nanofibrils and oral delivery strategies using lipid-based formulations and permeation enhancers. Integrating molecular design with advanced delivery technologies can overcome limitations in stability, bioavailability, and patient convenience.

**3:10 Peptide-Based Nanoparticles via Flash Nanocomplexation for Therapeutic Delivery**

*Joel P. Schneider, PhD, Deputy Director, Center for Cancer Research; Chief, Chemical Biology Laboratory, National Cancer Institute, National Institutes of Health*

Peptide design is used in combination with flash nanocomplexation (FNC) to produce uniform peptide-based particles of exceptional stability. FNC allows kinetic isolation of the mechanistic steps involved in particle formation facilitating the preparation of particles of discreet size in a highly reproducible, scalable, and continuous manner. We have prepared peptide-based miRNA particles for the

treatment of mesothelioma and are working towards pure peptidic particles for the delivery of therapeutic peptides.

**3:40 Breaking the Injection Barrier: Overcoming Challenges to Oral Delivery of Peptides**



*Amruta Mhashilkar, Assoc. Director, Formulation & Process Development, Formulation & Process Dev, Catalent Pharma Solutions*

Peptides and proteins face significant challenges when delivered orally, including GI instability, enzymatic breakdown, and limited absorption across biological membranes. Advanced lipid formulations, delayed-release softgels, and buccal or sublingual delivery systems are being developed to address these obstacles. These technologies help safeguard molecules, optimize release location, and improve lymphatic uptake. During this presentation, we will review data illustrating how these approaches can meaningfully increase bioavailability and enable practical oral delivery of macromolecules.

**4:10 Networking Refreshment Break**

**NOVEL MECHANISMS FOR PEPTIDE THERAPEUTICS**

**4:39 Chairperson’s Remarks**

*Devleena Samanta, PhD, Assistant Professor, Department of Chemistry; Associate Member, Livestrong Cancer Institutes; Member, Dell Medical School, Texas Materials Institute, The University of Texas at Austin*

**4:40 Drug Delivery by Synthetic Intrinsically Disordered Proteins**

*Ashutosh Chilkoti, PhD, Alan L. Kaganov Professor, Biomedical Engineering, Duke University*

I will discuss two synthetic—engineered—intrinsically disordered protein systems (SynIDPs) that we have developed that can be fused to peptide drugs at the gene level and enhance their *in vivo* delivery.

**5:10 Peptide-STING Agonist Conjugates for Cancer Vaccines**

*Natalie Artzi, PhD, Associate Professor, Medicine, Anesthesia, Brigham & Women’s Hospital*

We developed a carrier-free, self-assembling peptide–CDN nanoconjugate (PCN) that integrates immunogenic cell death (ICD) with cytosolic STING activation. Peptide-library screening revealed that enriched hydrophobic and cationic residues promote self-assembly, cell penetration, and robust ICD via lysosomal and mitochondrial disruption, driving *in situ* antigen release.

**5:40 Close of Day**

**FRIDAY, MAY 15**

**7:15 am Registration Open**

**INTERACTIVE ROUNDTABLE DISCUSSIONS**

**7:30 Interactive Roundtable Discussions with Continental Breakfast**

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

**TABLE 9: Recent Advances in Peptide Drug Conjugates (PDCs): Targeting Ligands and Carriers for Cytotoxics, Radionuclides, and Oligonucleotides**

*Annette Bak, PhD, Head, Advanced Drug Delivery, AstraZeneca*

- Emerging design strategies for PDCs
- Expanding payload classes
- Linker design strategies
- Translational and manufacturability considerations

**TABLE 10: Novel Mechanisms for Peptide Therapeutics**

*Devleena Samanta, PhD, Assistant Professor, Department of Chemistry; Associate Member, Livestrong Cancer Institutes; Member, Dell Medical School, Texas Materials Institute, The University of Texas at Austin*

- How can we design peptides that enter cells and remain functional in the intracellular environment?
- Can peptides be induced to assemble or disassemble at specific sites in the body to enhance potency, selectivity, or duration of action?
- How can we leverage virus-inspired multivalent display of peptide motifs or epitopes to enhance therapeutic efficacy?



## NOVEL MECHANISMS FOR PEPTIDE THERAPEUTICS

### 8:25 Chairperson's Remarks

*Devleena Samanta, PhD, Assistant Professor, Department of Chemistry; Associate Member, Livestrong Cancer Institutes; Member, Dell Medical School, Texas Materials Institute, The University of Texas at Austin*

### 8:30 Proteomimetic Polymers Targeting Tau, MYC, and KRAS

*Nathan C. Gianneschi, PhD, Jacob & Rosaline Cohn Professor, Departments of Chemistry, Materials Science & Engineering, Biomedical Engineering and Pharmacology, Northwestern University*

Significant barriers face the development of therapeutics against key, complex intracellular proteins that drive cancer and neurodegenerative disease. We present a new modality capable of selective and potent target engagement based on synthetic, precision polymer chemistry to design and develop proteomimetic therapeutics.

### 9:00 Enzyme-Instructed Peptide Assemblies for Organelle Targeting and Cell Modulation

*Bing Xu, PhD, Professor, Department of Chemistry, Brandeis University*

This talk will introduce the concept, simplicity, and uniqueness of enzyme-instructed self-assembly (EISA), focusing on its ability to generate intracellular peptide assemblies, including artificial filaments, within the cytosol. We will highlight examples of organelle-specific targeting (e.g., mitochondria, endoplasmic reticulum, Golgi apparatus, and nucleus) using enzymatically generated assemblies for therapeutic applications.

### 9:30 Bicycle Molecules as a Unique Peptide Therapeutics Technology

*Mark Frigerio, PhD, MBA, Vice President, Chemistry, Bicycle Therapeutics*

Bicycle molecules are bicyclic peptides formed by constraining short linear peptide sequences into a stabilized bi-cyclic structure

using a central chemical scaffold. Bicycle molecules have a unique structure that can be engineered to deliver with high precision to their chosen targets, while their size and surface area means they can potentially engage targets that have historically been resistant to conventional modalities.

### 10:00 DNA-Activated Peptide Assembly as a Strategy for Supramolecular Therapeutics

*Devleena Samanta, PhD, Assistant Professor, Department of Chemistry; Associate Member, Livestrong Cancer Institutes; Member, Dell Medical School, Texas Materials Institute, The University of Texas at Austin*

We are developing DNA-activated assemblies for responsive therapeutics (DARTs), a nucleic acid-guided strategy for controlling peptide self-assembly. In these peptide-DNA conjugates, DNA suppresses aggregation until a complementary trigger releases an assembly-competent state. This induces rapid supramolecular aggregation, including in cancer cells in response to endogenous biomarkers, causing cellular stress, membrane disruption, and loss of viability. By perturbing multiple pathways, this approach may also help overcome drug resistance.

### 10:15 Report Outs from Interactive Breakout Discussions

### 10:30 Networking Coffee Break

## FUTURE OF PEPTIDE THERAPEUTICS

### 10:44 Chairperson's Remarks

*Aaron K. Sato, PhD, Chief Strategy Officer, Adimab, LLC*

### 11:15 The Clinical Landscape of Drug Conjugate Therapies Using Peptides & Nanobodies

*Laurie Withington, PhD, Associate Director, Oncology Diseases, Citeline*

Nanobody and peptide conjugates are driving a new wave of precision therapeutics by combining highly selective binding with potent payload delivery. Peptide conjugate therapies lead the way in the clinic with approved therapeutics and many in development, while there are significantly fewer nanobody conjugates that have only advanced to phase II. I will review the competitive intelligence

of this landscape with respect to radio-, oligo-, antibody-, and degrader drug conjugates.

### 11:45 Talk Title to be Announced

*Ashok Bhandari, PhD, Executive Vice President, Chief Discovery Officer, Protagonist Therapeutics, Inc.*

### 12:15 pm Close of Summit

# MACHINE LEARNING STREAM

## ML and AI Driving the Next Frontier in Biotherapeutics

The Machine Learning stream at the PEGS Boston Summit 2026 convenes scientists advancing the convergence of AI, digital technologies, and biotherapeutics. This stream features state-of-the-art applications across three critical domains of drug development. The program begins with ML and digital integration in biotherapeutic analytics, examining how digital twins, real-world data, and automated platforms are reshaping data integration, validation, and translational decision-making from discovery through the clinic. It then progresses to computational and AI/ML tools for immunogenicity assessment, with an emphasis on structure-based prediction, and explainable AI to support regulatory confidence. The final program explores machine learning approaches for protein engineering, highlighting advances in generative AI, discovery, and optimization. Collectively, this stream charts the rapidly expanding role of AI/ML, simulation, and computational design in accelerating biologic drug development.



MACHINE LEARNING  
STREAM CONFERENCES

MAY 11-12

## ML and Digital Integration in Biotherapeutic Analytics

AGENDA

MAY 12-13

## Predicting Immunogenicity with AI/ML Tools

AGENDA

MAY 14-15

## Machine Learning for Protein Engineering

AGENDA



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

**SC1: In silico and Machine Learning Tools for Antibody Design and Developability Predictions**

\*Separate registration required. See short course page for details.

## MONDAY, MAY 11

7:00 am Registration and Morning Coffee

8:20 Organizer's Opening Remarks

**USE CASES OF ML/AI IN ANALYTICAL DEVELOPMENT**

8:25 Chairperson's Remarks

*Alejandro Carpy, PhD, Senior Director, Protein Sciences and Analytics, Biologics Engineering, AstraZeneca R&D***8:30 Challenges in Digital Representation and Bioanalytical Characterization of Antibody-Drug Conjugates***Joel Bard, PhD, Research Fellow, Bioinformatics, BioMedicine Design, Pfizer*

Antibody-drug conjugates present challenges around compound registration and property prediction. Antibodies are registered as amino acid sequences. Calculation of properties like molecular weight is straightforward. Small molecules also have a variety of formats for registration of compounds and software tools for property calculation. When small molecules and antibodies are conjugated, the problems of registration and property calculation become more complex. We will discuss approaches to solving these problems.

**9:00 Digitalization and Automation of Immunoassay in Bioanalysis***Andreas Hald, PhD, Manager, Research Bioanalysis, Novo Nordisk*

Immunoassay platforms are widely used in bioanalytical studies as they offer high sensitivity, specificity, require low sample volume, and are 384-well plate compatible. However, automation of immunoassays is challenged by extensive protocols and the complexity of assay development. To enhance bioanalytical workflows, we leverage digitalization and integrated automation for assay development and sample analysis. This presentation will cover our current E2E-platform and our next steps in digitalization, AI, and automation.

**9:30 KEYNOTE PRESENTATION: From Targets to Biologics: AI Powering the Next Leap in Discovery at Takeda***Yves Fomekong Nanfack, PhD, Head of AI/ML Research, Takeda*

Takeda's AI/ML strategy is redefining the path from targets to biologics, using advanced models to identify and validate novel targets, decode complex biology, and design the next generation of high-quality therapeutic molecules. By integrating agentic, generative, and large language model-driven approaches, AI is powering the next leap in discovery at Takeda.

**10:00 3dpredict: Scalable High-Quality Developability Predictions***Alain Ajamian, Director of Business Development, Chemical Computing Group*

Predicting potential liabilities such as aggregation or viscosity is a key step in monoclonal antibody development. Computational property prediction methods are routinely used in the selection and optimization of candidate antibodies. High-quality property prediction involves prediction of ensembles of 3D structures at specified pH to reduce sensitivity to single conformational states. We will present 3dpredict/Ab, a solution that enables ensemble-based predictions of antibody developability descriptors and putative liabilities. 3dpredict/Ab allows for out-of-the-box SaaS automation and integration of such complex simulations of hundreds or thousands of sequences, making them accessible and efficient.

**10:15 Direct Observation of Anomalous Thickening During liquid-liquid Collision Predicts Antibody Developability Failure***Shamit Shrivastava, Co-Founder & CEO, Apoha*

Antibody liabilities like aggregation, viscosity, and instability arise from the interplay of conformational, colloidal, and interfacial properties, yet existing assays probe these in isolation. We collide antibody droplets with a chemically distinct liquid surface, imposing concurrent interfacial, elongational, and ionic stress in a single ~20 ms event from <10 µg at 0.1 mg/mL. High-speed imaging reveals that liability-prone molecules undergo anomalous gel-like behavior at the collision neck; a stochastic, viscoelastic arrest that predicts clinical-stage failure with ~90% precision across 236 antibodies.

APOHA

**10:30 Networking Coffee Break****11:00 Toward an Automated and Auditable HPLC Chromatography Analysis Workflow***Zeran Li, PhD, Data Scientist, Moderna*

I will present an envisioned automated analytical workflow for RPIP-HPLC chromatograms, covering baseline inference, retention-time alignment, peak detection, deconvolution, and quantification. Parameter settings are optimized via Bayesian search. Every step—from raw-file ingestion and versioned configurations to QC metrics, anomaly flags, a cautious LLM-assisted reviewer-triage step to aid manual review and decision-making—is logged with immutable provenance, enabling auditability and supporting GxP compliance. We target cross-modal applicability without prescribing instrument-specific workflows.

**11:30 Unlocking the Capabilities of Microfluidic Electrophoresis for the Development of Protein-Based Therapeutics Using Predictive Analytics.***Jenna Rutberg, Researcher, Biomedical Engineering, Brown University*

We will discuss innovative methods that use both size-based and charge-based automated microfluidic electrophoresis to analyze different types of proteins and how this translates to the drug discovery and development process. We will also discuss how the results from these findings can be paired with artificial intelligence and how our predictive analysis method can be used for reagent manufacturing protocols for microfluidics applications.

**12:00 pm Session Break****12:10 LUNCHEON PRESENTATION: From Literature to Leads: AI-Powered Evidence Synthesis for Protein & Antibody Engineering***Xiangxu Kong, PhD, Scientific Leader, Elicit PBC*

Antibody and protein engineering teams must navigate a rapidly expanding body of published research — from sequence-function relationships and developability heuristics to competitive molecule characterization — yet literature synthesis remains manual, inconsistent, and hard to audit. We describe how discovery and protein sciences teams at leading pharma organizations are using AI to search, extract, and synthesize findings across thousands of publications in minutes, accelerating workflows like target-class landscape reviews, epitope and paratope mining, and developability benchmarking. Drawing on pilot deployments at top-20 pharma companies, we share early results on time-to-insight improvements and the design principles — citation-level provenance, systematic coverage, and human-in-the-loop validation — that make AI-assisted synthesis rigorous enough to trust at the bench.





### 12:40 LUNCHEON PRESENTATION: Benchling Benchling Biologics: AI Infrastructure for Modern Antibody Discovery

Lily Helfrich, Product Manager, Scientific Modalities, Product Management, Benchling

Antibody programs sit on years of data that should be an ML advantage. In practice, it rarely is. Data infrastructure hasn't kept pace with novel formats, leaving data siloed and relationships missing. AI-driven discovery demands a standard nomenclature and connected experimental context. We introduce Benchling Biologics—antibody registration with structural awareness and automated annotation across mAbs, bispecifics, and fusions—and show how teams unlock faster DBTL cycles with structured data.

1:10 Session Break

## ML/AI IMPACTS ON DEVELOPMENT PIPELINES

### 1:15 Chairperson's Remarks

Yi Han, PhD, Principal Scientist, Data Science, Biologics Development, Bristol-Myers Squibb

### 1:20 From Prediction to Purification: A Scalable HT Strategy for Multispecifics Manufacturing

Alejandro Carpy, PhD, Senior Director, Protein Sciences and Analytics, Biologics Engineering, AstraZeneca R&D

We present an integrated high-throughput workflow combining predictive modeling and automated purification to accelerate multispecific development. Leveraging data-driven parameter optimization and digital analytics, this scalable strategy enhances yield, robustness, and process consistency across diverse molecule classes including DuetMab and TITAN formats. Our standardized platform demonstrates significant efficiency gains, enabling rapid transition from design to manufacturing while maintaining quality standards for complex biotherapeutics.

### 1:50 Integrating Machine Learning and *in silico* Property Prediction into a Computational Workflow to Support CMC Development

Colin Stackhouse, Senior Scientist, Biologics Analytical Development, Johnson & Johnson Innovative Medicine

Antibody product quality is influenced by an interplay of extrinsic factors and inherent structural attributes of the molecule. To deconvolute the role of structural features on protein-protein interactions, a database of *in silico* surface properties was utilized

to map the biophysical feature space. An outlier detection algorithm was developed to identify structures with properties divergent from central tendencies in the data, identifying key regions in the latent space traceable to PPI outcomes.

### 2:20 Enabling Analytical Excellence: The Impact of Digital Integration in Clinical Method Performance

Yi Han, PhD, Principal Scientist, Data Science, Biologics Development, Bristol-Myers Squibb

Explore how digital tools and data automation are advancing the monitoring, evaluation, and enhancement of analytical methods for separation, impurity, and potency. Innovative strategies for integrating data and harnessing real-time insights will be showcased, enabling streamlined workflows and driving continuous improvement across the entire analytical lifecycle—elevating data quality, operational efficiency, and method performance in biotherapeutic analytics.

### 2:50 Decoding Bispecific Developability: Lessons from the Rational Design and Analysis of a 160-Member bsAb Library



Ammar Arsiwala, Director, Antibody Developability, Ginkgo Datapoints

We explored how parental Fab liabilities dictate the fate of final bispecific assembly, often guided by the "Rule of Additivity." Using a diversity-maximizing approach and profiling parental mAbs, we rationally designed and expressed a 160-member bispecific library. Applying Ginkgo's PROPHET-Ab platform, we generated a high-dimensional dataset to identify where parental inheritance holds versus where it breaks down. Our results shed light on the limits of linear additivity, characterizing "emergent" liabilities that escape standard predictions. This talk will highlight key correlations and significant decouplings between Fab-arm and bsAb attributes, supporting a more nuanced roadmap for de-risking complex biologics.

### 3:20 Networking Coffee & Refreshment Break

### 4:05 Transition to Plenary Keynote Session

## PLENARY KEYNOTE



### 4:15 Plenary Keynote Introduction

G. Jonah Rainey, PhD, Associate Vice President, Eli Lilly and Company



### 4:25 CARs 2026: New Models and New Runways

Michel Sadelain, MD, PhD, Director, Columbia

University Initiative in Cell Engineering and Therapy (CICET); Director, Cell Therapy Initiative, Herbert Irving Comprehensive Cancer Center; Professor of Medicine, Columbia University Irving Medical Center

T cell engineering holds great promise for the treatment of cancers and other pathologies. The original chimeric antigen receptor (CAR) prototypes targeting CD19 are now giving way to further refined receptors endowed with greater sensitivity and combinatorial possibilities. Emerging new targets and engineering tools augur favorably for broadening the use of CAR therapies.

## YOUNG SCIENTIST KEYNOTE



### 5:10 Deep Learning-Based Binder Design to Probe Biology

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Protein-protein interactions are central to biology and drug discovery, yet traditional antibody generation is slow and costly. BindCraft is an open-source, automated computational pipeline for *de novo* protein binder design that routinely yields nanomolar binders with 10-100% experimental success, without high-throughput screening or maturation. We illustrate applications to peptides, cell-surface receptors, allergens, and gene editors, and outline how deep-learning workflows can accelerate next-generation therapeutics, diagnostics, and bioprocessing.ion in the Exhibit Hall with Poster Viewing

## 5:55 Welcome Reception in the Exhibit Hall with Poster Viewing

## YOUNG SCIENTIST MEET-UP

### Young Scientist Meet-Up

Megan A. McSweeney, PhD, Postdoctoral Scholar, Jewett Lab, Stanford University  
Gian Marco Visani, PhD Graduate Student, University of Washington  
Jason Yang, PhD Candidate, Chemical Engineering, California Institute of Technology

This young scientist meet-up is an opportunity to get to know and network with mentors of the PEGS community. This session aims to inspire the next generation of young scientists by giving direct access to established



leaders in the field.

- Get to know fellow peers and colleagues
- Make connections and network with other institutions
- Discuss the role of mentors and peers role models in the field

## 7:15 Close of Day

TUESDAY, MAY 12

## 7:45 am Registration and Morning Coffee

### DIGITALIZATION AND AUTOMATION

#### 8:30 Chairperson's Remarks

Melody Shahsavarian, PhD, Director, Data Strategy & Digital Transformation, Biotherapeutics Discovery Research, Eli Lilly & Company

#### 8:35 Engineering Success: High-Throughput Developability for Next-Generation Biotherapeutics

Maniraj Bhagawati, PhD, Senior Scientist and Lab Head, Functional Characterization, Large Molecule Research, Roche pRED

To meet the demand for subcutaneous, high-concentration biologics, predicting protein behavior (e.g., viscosity, aggregation) is crucial yet challenging. We introduce an integrated, automated platform for early discovery screening. This process combines high-throughput, low-mass assays with *in silico* developability assessments to predict critical solution parameters and risks across diverse molecule formats, optimizing developability from inception.

#### 9:05 Scaling Developability: Automating High-Throughput Assays for Early Developability Assessment

Andrew Dippel, PhD, Associate Director, Protein Analytics & Developability, AstraZeneca

Modern biotherapeutic pipelines demand truly high-throughput, automated developability assessment to evaluate increasing candidate volumes efficiently. This presentation explores implementing standardized, automated assay platforms to generate comprehensive, high-quality developability datasets. By establishing this high-throughput developability data collection, we enable early identification of developability risks before costly downstream manufacturing issues arise, and generate the datasets essential for training robust machine-learning models.

#### 9:35 From Automation to Visualization: Robotic Sample Preparation, High-Throughput Developability Analysis, and Dashboards

Jan Paulo Zaragoza, PhD, Associate Principal Scientist, Discovery Biologics, Merck

This talk introduces a data-centric platform that combines robotics, high-throughput biophysical characterization, and decision-ready visualization. Automated liquid handling standardizes sample prep and scales throughput, while multiplexed assays quantify biophysical and stability parameters to identify risks early. Case studies show shorter cycles, improved data quality, and stronger portfolio decisions, with sample traceability, method validation, and seamless integration across automation platforms and informatics systems.

#### 10:05 Talk Title to be Announced

Jana Hersch, Head of Science, Genedata AG



#### 10:35 Coffee Break in the Exhibit Hall with Poster Viewing

### PROBLEMS AND SOLUTIONS

#### 11:15 Fit-for-Purpose Automation: Adapting Platforms to Our Science

Nick Mukhitov, PhD, Principal Research Scientist, AbbVie

We will share strategies leveraged in our group to enable forward compatibility of our platforms. We will address automation, data capture and custom engineering solutions to adopt our instrumentation to our science.

#### 11:45 Democratizing Data and AI for Biologics Research

Melody Shahsavarian, PhD, Director, Data Strategy & Digital Transformation, Biotherapeutics Discovery Research, Eli Lilly & Company

Advances in automation and AI have revolutionized the field of biologics discovery. Quantity of data is exponentially increasing, and ML architectures are rapidly improving. Key to leveraging this technological revolution lies in accessibility of data and AI. I will talk about our efforts at Lilly in developing an integrated digital platform that allows us to fully leverage experimental and data science toward improved decision-making and accelerated DMTA cycles.

#### 12:15 pm High-Throughput Structural Biology for AI-Enabled Antibody Discovery



Speaker to be Announced, Biortus

Biortus' high-throughput structural biology platform enables parallel exploration of epitope and affinity space, producing thousands of antibody-antigen structures per target. Using X-ray crystallography, cryo-EM, and NMR, we create fit-for-purpose datasets that enable AI-driven antibody design.

#### 12:45 Session Break

#### 12:50 LUNCHEON PRESENTATION: The PAIA Developability Assay Platform for the Fast and Comprehensive Biophysical Screening of Different Antibody Formats

PAIA

Sebastian Giehring, PAIA Biotech GmbH

Developability assessment remains a bottleneck in early antibody discovery. PAIA's plate-based developability assay platform provides a fast and easy-to-automate way to characterize hundreds to thousands of molecules per day. In this presentation we show developability screening data for different samples sets of mAbs, VHH-Fc-fusions and bispecifics, and compare the results with orthogonal and published data.

#### 1:20 LUNCHEON PRESENTATION: Closing the AI Data Loop: Automated High-Throughput Triage of *in silico* Antibody Hits

nuclera

Michael Chen, CEO & Co-Founder, Nuclera

Generative AI accelerates discovery, but few of hits are viable. Testing panels in 6 week mammalian workflows wastes resources and delays ML training. Our antibody screening service uses cell-free protein synthesis (CFPS) to deliver binding data for 94 variants in 24 hours. With CHO-equivalent binding profiles, CFPS enables rapid triage, ensuring only top candidates advance to SPR. Close your AI data loop faster.

#### 1:50 Close of ML and Digital Integration in Biotherapeutic Analytics Conference

#### 6:30 Recommended Dinner Short Course

##### SC6: Developability of Bispecific Antibodies

\*Separate registration required. See short course page for details.



## SUNDAY, MAY 10

2:00 pm Recommended Pre-Conference Short Course

**SC4: Unlocking Immunity: Mastering Epitope Analysis and Prediction with IEDB and CEDAR Tools & Insights**

\*Separate registration required. See short course page for details.

## TUESDAY, MAY 12

1:50 pm Networking Coffee &amp; Dessert Break in the Exhibit Hall with Poster Viewing

2:20 Organizer's Opening Remarks

**IMMUNOGENICITY RISK ASSESSMENT DATASETS**

2:25 Chairperson's Opening Remarks

Daniel Leventhal, PhD, Principal Consultant, Tactyl

2:30 A Streamlined Preclinical Workflow to Assess the Immunogenicity Risk of Biotherapeutics

Rita Martello, PhD, Scientific Director, NBE DMPK Lead &amp; Head of External NBE DMPK Leads Clinical Activities, Merck KGaA

We have established a workflow integrating immunogenicity risk assessment with *in silico* analysis, which can trigger *in vitro* assays. This streamlined approach reduces the number of costly low-throughput *in vitro* tests and serves as a screening tool for selecting less immunogenic formats. We enhance initial immunogenicity risk assessments and develop effective mitigation strategies, safeguarding patient safety and improving therapeutic outcomes.

3:00 Defining the Data behind the Models: Interpreting Clinical Immunogenicity Measures for AI/ML Risk Assessment

Daniel Leventhal, PhD, Principal Consultant, Tactyl

Predicting unwanted immunogenicity remains a major challenge in biotherapeutic development. This presentation reviews molecular, mechanistic, and clinical features contributing to anti-drug antibody risk, offers guidance for interpreting public clinical immunogenicity datasets, and highlights the Immunogenicity Database Collaborative (IDC)—a community effort to standardize and structure clinical ADA data. These resources aim to enable more interpretable, multivariable models that better reflect clinical immunogenicity complexity.

3:30 Talk Title to be Announced

Andrew Isidoridy, Immunology Sales Specialist, Sales, ProImmune Ltd



www.proimmune.com

4:00 Refreshment Break in the Exhibit Hall with Poster Viewing

4:10 Speed Networking

Speed Networking in the Exhibit Hall. Please see Networking Events Page for more details.

**SPEED NETWORKING****Speed Networking: How Many New Contacts Can You Make?**

Daniel Barry, Senior Conference Director, Cambridge Healthtech Institute

Bring yourself and your business cards or e-cards, and be prepared to share and summarize the key elements of your research in a minute. PEGS-Boston will provide a location, timer, and fellow attendees to facilitate the introductions.

**IMMUNOGENICITY PROPERTY PREDICTION**

4:40 Harnessing Human and Machine Intelligence for Next-Generation Immunogenicity Risk Prediction

Guilhem Richard, PhD, CTO, EpiVax Inc.

EpiVax has developed the ISPRI platform for assessing the immunogenic risk of biotherapeutics. New AI/ML models have been integrated into ISPRI, leading to enhanced prediction of tolerated epitopes and estimation of ADA responses. These updates improved characterization of epitopes within biotherapeutic molecules and enabled a 3-fold increase in the correlation between predicted and observed ADAs over existing approaches, with over 75% of predicted ADAs within 10% of observed values.

5:10 B Cell Epitope Predictions: Can We Benefit from Immune-Receptor Data?

Morten Nielsen, PhD, Professor, Department of Health Technology, Technical University of Denmark

Immunogenicity assessment is key for the development of biologics. Traditional approaches have focused on MHC Class II antigen presentation. However, recent advances in B cell epitope and antibody-antigen interaction prediction have significantly enhanced predictive capabilities. This talk will describe some of these tools and introduces AbEpiTope-1.0, tool for predicting antibody targets, suggesting how these tools can be integrated into computational pipelines for immunogenicity assessment and de-risking of protein therapeutics.

5:40 Mapping the T Cell Receptor Specificity Landscape through *de novo* Peptide Design

Gian Marco Visani, PhD Graduate Student, University of Washington

A computational framework to predict TCR recognition of peptides presented by MHC-I and to design novel immunogenic peptides. Using HERMES, a model trained on the protein universe to predict amino acid preferences based on local structural environments, we accurately predict TCR-pMHC binding and T cell activity without task-specific training. We further design and experimentally validate *de novo* peptides that activate T cells and map peptide recognition landscapes across TCR-MHC systems.

6:10 Close of Day

6:30 Recommended Dinner Short Course

**SC6: Developability of Bispecific Antibodies**

\*Separate registration required. See short course page for details.

## WEDNESDAY, MAY 13

8:00 am Registration Open

**PEGS YOUNG SCIENTIST KEYNOTE ALUMNI PANEL**

8:25 Chairperson's Remarks

8:30 Innovation in Protein Science with Young-Scientist Visionaries



Moderator: James A. Wells, PhD, Professor, Departments of Pharmaceutical Chemistry and Cellular & Molecular Pharmacology, University of California, San Francisco

2026 marks the 10-year anniversary of the PEGS Young Scientist Keynote, and these honorees have been selected for their outstanding contributions to the field of protein science and engineering. Our panel of YSK alumni will discuss the recent course of these contributions and discuss the factors that allowed them to quickly launch successful labs and research groups.



## Panelists:

Martin Pacesa, PhD, Assistant Professor, Pharmacology, University of Zurich

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

Kipp Weiskopf, MD, PhD, Head of Antibody Therapeutics and Biologics, Cancer Research Institute, Beth Israel Deaconess Medical Center; Assistant Professor of Medicine & Physician, Department of Medical Oncology, Dana-Farber Cancer Institute, Harvard Medical School

Timothy A. Whitehead, PhD, Professor, Chemical & Biological Engineering, University of Colorado, Boulder

Xin Zhou, PhD, Assistant Professor, Biological Chemistry & Molecular Pharmacology, Dana-Farber Cancer Institute, Harvard Medical School

## 9:15 Coffee Break in the Exhibit Hall with Poster Viewing

## MENTORING MEET-UP

## Mentoring Meet-Up: Creating and Fostering a Productive and Effective Mentor-Mentee Relationship

Jonathan Davis, PhD, Founder and Principal Consultant, Creative Antibodies

Jamie B. Spangler, PhD, Associate Professor, Biomedical and Chemical & Biomolecular Engineering, Johns Hopkins University

## IMMUNOGENICITY PROPERTY PREDICTION

## 10:00 Chairperson's Remarks

Sophie Tourdot, PhD, Immunogenicity Sciences Lead, Research and Development, Pfizer

## 10:05 Mapping the Anti-Drug Antibody Binding Site on Multidomain Biotherapeutics

Xiaobin Zhang, PhD, Associate Director, Takeda Pharmaceuticals  
Immunogenicity of biotherapeutics poses a significant efficacy or safety concern in drug development. It is crucial to select candidates with low immunogenicity risk or de-immunize the candidates at an early stage. In this presentation, I will introduce the tool of *in silico* prediction, domain competitive assay, and peptide screening for a multidomain therapeutics in preclinical and clinical studies. This integrated immunogenicity assessment will enhance the success ratio in drug development.

## 10:35 Improving Clinical Anti-Drug Immunogenicity Prediction with B Cell Epitopes

Will Thrift, PhD, Principal Artificial Intelligence Scientist, Genentech

We present a prototypical workflow for leveraging B cell epitope prediction, together with structural humanness assessment, to enhance immunogenicity risk evaluation for biotherapeutics. Using large clinical datasets of anti-drug antibody responses, we show that integrating B cell epitope and humanness information improves both precision and recall in immunogenicity prediction compared to T cell epitope only approaches, highlighting its potential to refine preclinical risk assessment strategies.

## 11:05 Presentation to be Announced

## 11:35 Session Break

## 11:40 Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own

## 12:10 pm Luncheon Presentation (Sponsorship Opportunity Available) or Enjoy Lunch on Your Own

## INTERACTIVE BREAKOUT DISCUSSIONS

## 12:40 Find Your Table and Meet Your Discussion Moderator

## 12:50 Interactive Roundtable Discussions

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.

TABLE 11: Practical Considerations for Incorporating *In Silico* Risk Assessment and Mitigation Earlier in Drug Design

Sophie Tourdot, PhD, Immunogenicity Sciences Lead, Research and Development, Pfizer

TABLE 12: Benchmarking *In Silico* IgG and VHH Humanization Tools

Tony Pham, Senior Scientist, Biologics Engineering & Developability, AstraZeneca



## IN SILICO IMMUNO SYSTEMS MODELING

## 1:35 Chairperson's Remarks

Lora Hamuro, PhD, Senior Director, Clinical Pharmacology & Pharmacometrics, Bristol Myers Squibb

## 1:40 Evaluating the Immunogenicity Risk of Protein Therapeutics by Augmenting T Cell Epitope Prediction with Clinical Factors

Zicheng Hu, PhD, Former Principal Scientist, Genentech

Protein-based therapeutics can trigger anti-drug antibodies (ADAs) that affect pharmacokinetics, efficacy, or safety. Using Roche/Genentech clinical data, we identified factors influencing drug immunogenicity across monoclonal antibodies and other modalities. ADA incidence was linked to drug and comedication mechanisms, administration routes, and disease types. Combining these clinical factors with *in silico* epitope predictions improved the accuracy of clinical immunogenicity prediction.

## 2:10 Immune System Modeling of Immunogenicity for a Biotherapeutic Combination

Lora Hamuro, PhD, Senior Director, Clinical Pharmacology & Pharmacometrics, Bristol Myers Squibb

This seminar presents quantitative systems pharmacology modeling of immunogenicity for biotherapeutic combinations, focusing on nivolumab and ipilimumab. The model showed that combining these agents increases nivolumab anti-drug antibodies compared to monotherapy but does not significantly alter pharmacokinetics, consistent with clinical data. This mechanistic approach to understanding immunogenicity can be applied to other biotherapeutic combinations.

2:40 IGMotifFinder: Improving Preclinical *in silico* Immunogenicity Assessment via Integration of Pathogen Similarity Analysis

Brunno Rocha, PhD, Data Science Innovation Postdoctoral Fellow, Bioinformatics and Biotherapeutic Modeling, Novartis

Biotherapeutics may include motifs similar or identical to pathogenic sequences, acting as cross-reactive T cell epitopes that increase immunogenicity potential. IGMotifFinder is an *in silico* platform developed to identify HLA class II-presented cross-reactive motifs. Analysis of over 200 biotherapeutics revealed that a higher "pathogenic" to "self" motif-ratio correlates with increased clinical immunogenicity. IGMotifFinder will support early identification and proactive mitigation of immunogenicity in biotherapeutics.

**3:10 Mitigation of Immunogenicity During Drug Design**

Christina Fu, PhD, Senior Principle Scientist, PDM, Pfizer

**3:40 Ice Cream & Coffee Break in the Exhibit Hall with Poster Viewing****INTEGRATING IN SILICO IMMUNOGENICITY AND DEVELOPABILITY ASSESSMENTS****4:20 KEYNOTE PRESENTATION: Generalized Multi-Objective Optimization Methods for the Design and Engineering of Low-Immunogenicity Protein Therapeutics**

Ryan Peckner, PhD, Director, Machine Learning, Seismic Therapeutic

We develop machine learning models to simultaneously optimize multiple drug-like properties of biologics, including antibodies and enzymes. Our generative models that harness both the design of functional proteins and the prediction of drug-like properties to engineer therapeutically developable proteins with low immunogenicity. We produce and experimentally characterize these designs for fitness, function, and developability, exploring the synergy of these methods in a generalized multi-objective optimization pipeline for biologics.

**4:50 Discovery to Development: Computational Approaches for Immunogenicity De-Risking**

Priyanka Gupta, PhD, Principal Scientist, Biotherapeutics, Boehringer Ingelheim Pharmaceuticals, Inc.

Molecular sequence is a key contributor to immunogenic responses against biologic drugs. Leveraging *in silico* techniques enables early identification and mitigation of sequence-associated risks during the discovery phase, in a high-throughput and efficient manner. This presentation will highlight computational strategies that integrate a suite of *in silico* tools to optimize lead molecules for developability and reduce immunogenicity risk—ultimately accelerating the path to candidate selection.

**APPLYING AI STRATEGIES TO NEW MODALITIES****5:20 Immunovate: A Design-Focused Approach to Minimizing Immunogenicity with ML**

Frank Teets, PhD, Head, Computational Science, AI Proteins

*In silico* predictions of immunogenicity have long been a grand challenge in the design of polypeptide therapeutics. While a complete solution remains difficult, the power of novel *de novo* design methods can be coupled with ML methods to produce an automated, general solution for minimizing unwanted immunogenicity in *de novo* designed miniproteins. We present Immunovate, a lightweight solution for controlling miniprotein immunogenicity at several levels of simulation complexity.

**IMMUNOGENICITY PROPERTY PREDICTION****5:50 From HLA Class II Peptide Presentation to Immunogenicity Screening of Therapeutic Antibodies with HLAIIPred**

Mojtaba Haghighatlari, PhD, Senior Principal Machine Learning Scientist, Pfizer Inc.

HLAIIPred is an end-to-end and context-free deep learning model that predicts HLAII-presented peptides on the surface of antigen presenting cells. In this presentation, the design methodologies integrated with HLAIIPred will be highlighted, providing important insights into peptide-HLAII interactions through the identification of core peptide residues. Additionally, screening strategies are discussed for predicting unwanted immunogenic segments in therapeutic antibodies using HLAII presentation models.

**6:20 Networking Reception in the Exhibit Hall with Poster Viewing****7:20 Close of Predicting Immunogenicity with AI/ML Tools Conference**



## SUNDAY, MAY 10

## 2:00 pm Recommended Pre-Conference Short Course

SC1: *In silico* and Machine Learning Tools for Antibody Design and Developability Predictions

\*Separate registration required. See short course page for details.

## THURSDAY, MAY 14

## 7:30 am Registration Open

## 7:30 From Scientist to Start-Up: An Interactive Entrepreneurship Breakfast

Moderator: Catharine Smith, Executive Director, Termeer Foundation

Join us for an interactive breakfast conversation on the journey from scientist to entrepreneur, featuring founder, CSO, CEO, and investor perspectives. Panelists will share how they navigated the leap from postdoc to scientist to startup leadership, from securing initial funding and building teams to cultivating networks of mentors and advisors.

Panelists:

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Noor Jailkhani, PhD, CEO & Co-Founder, Matrisome Bio

## 8:30 Transition to Sessions

## 8:40 Organizer's Remarks

USE OF AI IN COMPLEX MODALITIES:  
MULTISPECIFICS AND NOVEL SCAFFOLDS

## 8:45 Chairperson's Remarks

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi

## 8:50 Presentation to be Announced

## 9:20 Accurate Protein-Binder Design Using BindCraft

Lennart Nickel, Graduate Student, Biotechnology & Bioengineering, École Polytechnique Fédérale de Lausanne

Protein-protein interactions are fundamental to biology but remain difficult to design due to their structural complexity. We introduce BindCraft, an open-source platform for *de novo* protein-binder design that achieves high-affinity binding without experimental optimization or prior binding information. BindCraft enables the generation of functional binders for diverse targets including receptors, allergens, and nucleases, advancing a "one design one binder" paradigm with broad potential in therapeutics, diagnostics, and biotechnology.

## 9:50 Designing Biochemical Function with Generative AI

Rohith Krishna, PhD, Postdoctoral Fellow, Computational Biology & Machine Learning, University of Washington

Deep learning has accelerated protein design, but most existing methods are restricted to generating protein backbone coordinates and often neglect interactions with other biomolecules. I will present the next generation of protein design methods that include side-chain coordinates for design of more complex biomolecular function. Finally, I will show a series of applications of these algorithms to design of experimentally characterized functional proteins.

## 10:20 LensAI: A Multi-Parametric AI Platform for Integrated Antibody Discovery, De-Risking, and Engineering



Shuji Sato, VP of Innovative Solutions, Business Development, MindWalk

This approach enables antibody discovery from sequence only, with traceable outputs across discovery stages. LensAI™, powered by HYFT®, applies multi-parametric analysis by integrating AI models with large-scale lab and *in silico* data. It supports triaging hits from *in vivo*, *in vitro*, and repertoire sequencing, performs clone clustering, and evaluates epitope and paratope features with developability, manufacturability, and immunogenicity predictors for sequence-level mapping toward engineered preclinical leads.

## 10:35 Multimodal Fusion of Empirical Structural Data and Deep Learning for Improved Modeling of Antibody-Antigen Complexes



Dan Benjamin, CTO & CoFounder, R&D, Immuto Scientific

We present a multimodal AI framework that fuses radical footprinting data with deep learning to more accurately model antibody-antigen complexes, including disordered and hypervariable interfaces. Using Immuto's high-throughput radical footprinting platform, large-scale structural datasets, comprising hundreds of protein complexes, are generated to train AI systems, providing solution-state, dynamic data across all protein classes, including multipass transmembrane proteins. These experimental constraints enable advanced, actionable models for antibody engineering, affinity maturation, and specificity design.

## 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

## ENTREPRENEUR MEET-UP

## Fostering Entrepreneurship and Models for Start-Ups

Natalie Galant, PhD, CEO, Paradox Immunotherapeutics

Catharine Smith, Executive Director, Termeer Foundation

Are you a founder or aspiring founder? Are you an academic entrepreneur? Join Natalie and Catharine and PEGS attendee founders and entrepreneurs for networking and discussion. We will discuss existing resources for academic entrepreneurs, founders, and start-up leaders, and areas where the ecosystem can better support you.

## PLENARY FIRESIDE CHAT



## 11:35 Plenary Fireside Chat Introduction

Eric Smith, PhD, Vice President, Bispecific Antibodies, Regeneron Pharmaceuticals, Inc.

## 11:40 PANEL DISCUSSION: How to Think about Designing Smart Biologics in the Age of GenAI: Integrating Biology, Technology, and Experience



Moderator: Christopher J. Langmead, PhD, AI-Driven Molecular Design, Danaher Corporation

The conversation will explore:

- How AI is accelerating early discovery and molecular design for biologics
- Emerging strategies for integrating experimental data and large language models
- The challenges of data quality, interoperability, and interpretability
- The evolving roles of scientists, data, and automation in the next generation of discovery labs

Panelists:

Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

Rebecca Croasdale-Wood, PhD, Senior Director, Augmented Biologics Discovery & Design, Biologics Engineering, Oncology, AstraZeneca

Joshua Meier, Co-Founder & CEO, Chai Discovery

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi



12:35 pm Networking Luncheon in the Exhibit Hall and Last Chance for Poster Viewing

## DEVELOPABILITY AT-SCALE

### 2:05 Chairperson's Remarks

*M. Frank Erasmus, PhD, Head, Bioinformatics, Specifica, an IQVIA business*

### 2:10 Predicting sdAb Biophysical and Developability Properties

*Andrei Kamenski, PhD, Senior Data Scientist, InSilico Biologics Discovery, Novo Nordisk R&D UK*

Single-domain antibodies (sdAbs), such as camelid VHH, are a strong focus area in biologics discovery due to their small size and modularity. However, the link between sdAb sequence, structure, and developability is poorly understood. To bridge this gap, we trained machine learning models on custom early-stage developability datasets, predicting key properties such as thermostability, hydrophobicity, and polyreactivity. In this talk, we will share our latest scientific and modelling insights.

### 2:40 Application of AI to Developability Screening, a Sceptic's View

*Andrew C.R. Martin, DPhil, Emeritus Professor of Bioinformatics and Computational Biology, University College London*

AI has been used in bioinformatics since the early 1990s, but recent advances, driven by approaches such as protein-language and generative models, have revolutionized many areas of life. There have been several publications that use such approaches for *ab initio* antibody design, but I for one remain skeptical. Nonetheless, there are clear applications for modern AI techniques around antibody developability, and improving candidate antibody-based drugs.

### 3:10 TherAbDesign: Bridging AI and Biophysics for Antibody Developability Optimization

*Amy Wang, PhD, Senior ML Scientist, Prescient Design, Genentech*

Antibodies are promising protein therapeutics, but successful development requires meeting strict developability criteria. We present TherAbDesign, a machine-learning method that evaluates and optimizes antibodies based on sequence alone, proposing modifications that mimic the biophysical properties of successful therapeutics. This approach circumvents computationally expensive structure prediction and physics-based calculations. We show that this method improves known developability liabilities, such as viscosity, without explicitly modeling their mechanism of action.

### 3:40 Scalable, Robust and Easy to Use Biologics Discovery & Development with Generative AI

*Eli Bixby, Co Founder & Head of ML, ML Research & Engineering, Cradle*

Generative AI is redefining what's possible in biologics discovery – enabling scientists to explore protein sequence space more efficiently, design higher-performing molecules, and accelerate the path from concept to candidate. At Cradle, we are developing intuitive software tools that allow protein engineers to directly leverage generative AI models within their existing workflows. This presentation will showcase how Cradle's technology enables scalable and reproducible protein design, combining advanced AI architectures with user-centered design to reduce cycle times and ultimately create better biologics.

### 4:10 Networking Refreshment Break

## INNOVATION SHOWCASE

### 4:40 Innovation Showcase Talk Title to be Announced

*Elise Pepermans, CEO and cofounder, immunopeptidomics, ImmuneSpec*

### 4:45 Innovation Showcase Presentation to be Announced

## DEVELOPABILITY AT-SCALE (CONT.)

### 5:10 Benchmarking Language Models for Antibody and Nanobody Tasks

*Koji Tsuda, PhD, Professor, Computational Biology & Medical Sciences, University of Tokyo*

Recent advances in protein language models (PLMs) have demonstrated strong performance on structure and function prediction. To evaluate their performance in nanobody-related tasks, we developed a comprehensive benchmark suite, NbBench. Benchmarking of eleven models revealed that antibody language models excel in antigen-related tasks, while thermostability and affinity-related tasks remain challenging across all models. We further discuss how PLMs and their benchmarks could impact on antibody research.



### 5:40 PANEL DISCUSSION: Are *In Silico* Tools Truly Reducing Clinical Failure and Accelerating Development?

*Moderator: M. Frank Erasmus, PhD, Head, Bioinformatics, Specifica, an IQVIA business*

- Validity of Proxies
- Manufacturing vs. Efficacy
- Generative Bias:
- The Negative Data Gap
- False Positives
- The MHC Limitation
- Predicting Tolerance

*Panelists:*

*Hunter Elliott, PhD, Senior Director, Machine Learning, BigHat Biosciences*

*Sandeep Kumar, PhD, Senior Vice President, Digital Biologics, Natural Antibody*

*Andrei Kamenski, PhD, Senior Data Scientist, InSilico Biologics Discovery, Novo Nordisk R&D UK*

### 6:10 Close of Day

## FRIDAY, MAY 15

### 7:15 am Registration Open

## INTERACTIVE ROUNDTABLE DISCUSSIONS

### 7:30 Interactive Roundtable Discussions with Continental Breakfast

Interactive Roundtable Discussions are informal, moderated discussions, allowing participants to exchange ideas and experiences and develop future collaborations around a focused topic. Each discussion will be led by a facilitator who keeps the discussion on track and the group engaged. To get the most out of this format, please come prepared to share examples from your work, be a part of a collective, problem-solving session, and participate in active idea sharing. Please visit the Interactive Roundtable Discussions page on the conference website for a complete listing of topics and descriptions.



### TABLE 1: The Alntibody Challenge: Inaugural Results and What's New in Challenge 2

Andrew R.M. Bradbury, MD, PhD, CSO, Specifica, an IQVIA business  
M. Frank Erasmus, PhD, Head, Bioinformatics, Specifica, an IQVIA business

- Review final results from the initial Alntibody Challenge, which included >30 teams across pharma, biotech, academia and AI companies. The final manuscript will be submitted in February and published later in Nature Biotech
- Evaluate target affinity, developability (minimum score), and submission time
- Discuss plans for the second challenge

### TABLE 2: From Binding to Application: What Will It Take for De Novo Binders to Succeed?

Lennart Nickel, Graduate Student, Biotechnology & Bioengineering, École Polytechnique Fédérale de Lausanne

- Are *de novo*-designed miniproteins moving beyond academic proof-of-concept toward robust, reproducible therapeutic platforms?
- What technical, biological, and manufacturing hurdles must still be addressed for *de novo* formats to truly rival antibody-derived scaffolds?
- In which applications do antibodies and miniproteins naturally coexist, and where do miniproteins provide superior performance or design freedom?
- What do we know and how much can we predict the immunogenicity of *de novo* protein binders?

## LAB-IN-THE-LOOP

### 8:25 Chairperson's Remarks

Victor Greiff, PhD, Associate Professor, University of Oslo; Director, Computational Immunology, IMPRINT

### 8:30 Better Antibodies Engineered with a GLIMPSE of Human Data

Lance Hepler, PhD, Co-Founder, R&D, Infinimmune Inc.

Infinimmune presents GLIMPSE, an antibody language model trained on proprietary human data that achieves state-of-the-art performance. We used GLIMPSE within our lab-in-a-loop platform to engineer an anti-IL-13 antibody, enhancing its drug-like properties including potency, extended half-life, affinity, stability, and manufacturability via liability removal. This work demonstrates the practical application of language models for optimizing therapeutics while maintaining their humanness, moving beyond typical proof-of-concept studies.

### 9:00 Training Data Composition Determines Machine-Learning Generalization and Biological Rule Discovery

Victor Greiff, PhD, Associate Professor, University of Oslo; Director, Computational Immunology, IMPRINT

We evaluated how different negative-class definitions affect generalization and rule discovery in antibody-antigen binding using synthetic structure-based data. Models trained with negatives more similar to positives had reduced in-distribution performance but markedly better out-of-distribution generalization. Ground-truth analyses revealed that inferred binding rules shift with negative set choice, and experimental validation confirmed these findings, emphasizing dataset design for robust, biologically meaningful models.

### 9:30 Computational Design of Antibody Repertoires

Ariel Tennenhouse, Graduate Student, Biomolecular Sciences, Weizmann Institute of Science

We are developing a new strategy for designing repertoires of billions of structurally diverse and stable human antibodies. I will first describe two methods we developed for atomistic antibody design that enable this strategy and show that each method can optimize antibodies across a variety of criteria without prior mutational data. This shows that optimizing native-state energy is an excellent first approach for antibody optimization.

### 10:00 Unify and Accelerate AI-Powered Lab-in-the-Loop Drug Discovery with Amazon Bio Discovery

Jiwon Kim, Amazon Web Services

Drug discovery takes 10 years and \$2.6B per approved therapeutic. Amazon Bio Discovery unifies the full Lab-in-the-Loop workflow — AI model access, experiment design, *in silico* candidate optimization, wet-lab ordering, and closed-loop learning all in one platform. Accelerate your antibody discovery pipeline with a free 30-day trial.

### 10:30 Networking Coffee Break

## DE NOVO BIOLOGICS DESIGN: USING AI TO CREATE BRAND-NEW ANTIBODIES AND PROTEINS FROM SCRATCH

### 10:44 Chairperson's Remarks

Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

### 10:45 From Proof-of-Concept to Proof-of-Productivity and Scale

Hans M. Bitter, PhD, Head Computational Science, Data Strategy, Takeda Pharmaceutical Co. Ltd.

Proof-of-concept has been demonstrated, showing how AI methods can be used to design and optimize large molecules. We must shift our focus to scaling to maximize the productivity and innovation gains. This talk will cover a selection of PoCs and then how we are scaling digital biologics at Takeda across our portfolio.

### 10:55 Massively Multiplexed *in vivo* Screening of AI-Designed Proteins Enables Programmable Tissue Targeting

Pierce J. Ogden, PhD, Co-Founder & CSO, Manifold Biotechnologies Inc.

At Manifold Bio, we've built a direct-to-*vivo* platform that connects AI-driven protein design to functional data from living systems. Using this approach, we generate and evaluate thousands of designed binders to novel targets simultaneously *in vivo*. This massively multiplexed framework has yielded functional brain shuttles capable of crossing the blood-brain barrier, and we are now extending it to other tissues to enable selective delivery of diverse therapeutics.

### 11:05 Push-Button Biologics Design

Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

We recently announced JAM-2, which can design antibodies with drug quality properties with high success rates. We'll discuss these results, and also share examples of what successful deployment on real drug discovery programs partnered with large pharma looks like. We'll discuss roadblocks and share practical lessons/ advice for how to build teams and infrastructure to ensure AI driven biologics discovery delivers real drugs not just headlines.

### 11:15 PANEL DISCUSSION: De novo Biologics Design: Using AI to Create Brand-New Antibodies and Proteins from Scratch

Moderator: Surge Biswas, PhD, Founder & CEO, Nabla Bio, Inc.

Panelists:

Hans M. Bitter, PhD, Head Computational Science, Data Strategy, Takeda Pharmaceutical Co. Ltd.

Pierce J. Ogden, PhD, Co-Founder & CSO, Manifold Biotechnologies Inc.

Maria Wendt, PhD, Global Head (Vice President) of Digital and Biologics Strategy and Innovation, Large Molecule Research, Novel Modalities, Synthetic Biology and AI, Sanofi

### 12:15 pm Close of Summit



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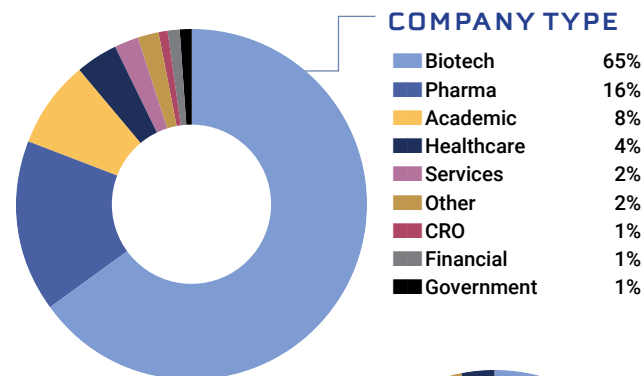
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Senior Manager, Business Development  
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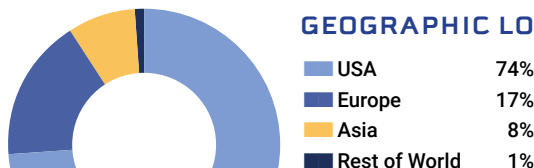
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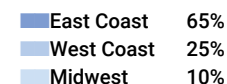
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