

*Preliminary Program*

*June 9, 2026*

# **Biochemical and Molecular Engineering XXIV**

*Harnessing the Power of Community for a Stronger Biotech Future*

**July 19 – 23, 2026**

**Puerto Rico**

**Conference Chairs**

**Mark Blenner, University of Delaware, USA**

**Amanda Lewis, Moderna, USA**

**Danielle Tullman-Ercek, Northwestern University, USA**



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## **Sunday, July 19, 2026**

- 13:00 – 15:15 Conference Check-in
- 15:15 – 15:25 Conference Welcome (Conference Chairs)
- Session 1: Harnessing the Power of Communities for a Stronger Biotech Future**  
Session Chairs: Bradley Biggs and Angela Chen
- 15:25 – 15:30 **Towards an understanding of microbial community assembly to enable improved metabolic engineering SynComs design**  
Bradley Biggs, University of Michigan, USA
- 15:30 – 15:35 **Leveraging cross-kingdom RNA communication and nanotechnology for improved disease control**  
Angela Chen, Michigan State University, USA
- 15:35 – 15:55 **Engineering microbial consortia for mixed plastic upcycling**  
Tae Seok Moon, J. Craig Venter Institute, USA
- 15:55 – 16:15 **Invited Talk: Modular enzyme display in microbial consortia for efficient polymer upcycling**  
Qing Sun, Texas A&M University, USA
- 16:15 – 16:35 **Invited Talk: Accelerating synthetic biology tools for anaerobic microbial communities**  
Michelle O'Malley, University of California - Santa Barbara, USA
- 16:35 – 16:55 **Invited Talk: Hidden figures: Gut microbes and their enzymes that promise efficient plastics wastes deconstruction for sustainable biomanufacturing**  
Kevin Solomon, University of Delaware, USA
- 17:00 – 18:00 **Keynote 1: Communities in Industrial Biotechnology**  
**(Introduced by Danielle Tullman-Ercek)**  
**From reactors to ecosystems: Lessons in deploying microbial technologies**  
Kirsten Benjamin, Oath, Inc., USA
- 18:00 – 19:30 Dinner
- 19:30 – 21:30 **Poster Session 1 (Odd numbers present)**  
Chairs: Carolyn Mills and Ben Woolston

## **Monday, July 20, 2026**

- 07:00 – 08:30 Breakfast
- 08:30 – 09:30 **Keynote 2: Communities in Biopharmaceuticals**  
(Introduction by Amanda Lewis)  
**Evolving platforms for the next generation of mRNA medicines**  
Shyam Subramanian, Moderna, Inc., USA
- Session 2: Discovery and Manufacturing of Biopharmaceuticals**  
Session Chairs: Blaise Kimmel and Lisa Volpatti
- 09:30 – 09:35 **Generating a high-throughput platform technology for the discovery, assembly, and evaluation of immune-modulating nanobodies**  
Blaise Kimmel, Ohio State University, USA
- 09:35 – 09:40 **Engineering valency in LDL-targeted IL-10 fusion proteins**  
Lisa Volpatti, Northwestern University, USA
- 09:40 – 10:00 **Complete biosynthesis of penicillin g in the plant host nicotiana benthamiana**  
Elizabeth Skellam, University of North Texas, USA
- 10:00 – 10:20 **Engineering the next generation of microbial production strains for biologics**  
Markus Mund, Sanofi, USA
- 10:20 – 11:00 Coffee Break
- 11:00 – 11:20 **Invited Talk: Novel receptors to enhance cell immunotherapy safety and efficacy**  
Johnny Blazeck, Georgia Institute of Technology, USA
- 11:20 – 11:40 **Design and directed evolution of brain-penetrant biologics**  
Pete Tessier, University of Michigan, USA
- 11:40 – 12:00 **Invited Talk: Discovery and engineering of natural product biosynthetic pathways**  
Yi Tang, University of California Los Angeles, USA
- 12:00 – 13:15 Lunch
- 13:15 – 15:30 **Poster Session 2 (Even numbers present)**  
Chairs: Carolyn Mills and Ben Woolston  
*Coffee and refreshments will served*
- Session 3: Constructing and Deconstructing Materials**  
Session Chairs: Sara Molinari and Carolyn Mills
- 15:30 – 15:35 **Engineering self-assembling living materials via elastin-like polypeptide surface display in *E. coli***  
Sara Molinari, University of Maryland College Park, USA
- 15:35 – 15:40 **Investigating the molecular principles governing protein recruitment to bacterial condensates**  
Carolyn Mills, University of California, Santa Barbara, USA
- 15:40 – 16:00 **Invited Talk: Expression and evolution of high conductivity cytochrome nanowires**  
Keith Keitz, University of Texas at Austin, USA
- 16:00 – 16:20 **Using a genetic approach to design novel mycelial materials**  
Mark Marten, University of Maryland Baltimore County, USA
- 16:20 – 16:40 **Invited Talk: 3D-printed bio-hybrid systems for sustainable production of hydrogen fuel**  
Anne Meyer, University of Rochester, USA

**Monday, July 20, 2026** (continued)

- 16:40 – 17:00      **Invited Talk: Engineering the circular economy—Molecular precision as a catalyst for industrial disruption**  
Julie Willoughby, TerraSafe, USA
- 18:00 – 19:30      Dinner
- 19:30 – 21:00      **Special Networking Trivia Night**  
Host: Thomas Mansel  
Come socialize with conference attendees while competing for bragging rights.

**Tuesday, July 21, 2026**

- 07:00 – 08:30 Breakfast
- 08:30 – 09:30 **Keynote 3: Communities in Academic Biotechnology (Introduction by Mark Blenner)**  
**Synthetic biology for people and planet health**  
Mike Jewett, Stanford University, USA
- Session 4: Design and Applications of Biomolecular Sensors**  
Session Chairs: Cat Majors and Asher Williams
- 09:30 – 09:35 **A split enzyme-based self-amplification system for rapid, sensitive detection of proteins and small molecules**  
Cat Majors, Clemson University, USA
- 09:35 – 09:40 **Engineering molecular recognition for biotechnology and therapeutic applications**  
Asher Williams, Columbia University, USA
- 09:40 – 10:00 **Invited Talk: Point-of-care protein sensing with minimal equipment using cell-free systems**  
Mark Styczynski, Georgia Institute of Technology, USA
- 10:00 – 10:20 **Invited Talk: A protein engineering platform for sustainable metal separations**  
Ariel Furst, Massachusetts Institute of Technology, USA
- 10:20 – 11:00 Coffee Break
- 11:00 – 11:20 **Invited Talk: Fluorescent based protease detection probe with logic gating capabilities**  
Wilfred Chen, University of Delaware, USA
- 11:20 – 11:40 **Invited Talk: Design and selection of new sensors for non-canonical amino acids**  
Ross Thyer, Rice University, USA
- 11:40 – 12:00 **Computational design of biosensors for diagnostics, screening tools, and controlling life**  
Tim Whitehead, University of Colorado, USA
- 12:00 - 13:30 Lunch
- Free time / Optional Activities**
- Dinner on your own**

## Wednesday, July 22, 2026

07:00 – 08:30

Breakfast

08:30 – 09:00

**Special: Bob Kelly Tribute**

Mike Betenbaugh, Johns Hopkins University, USA

**Session 5: Bioproduction Innovation**

Session Chair: Wheaton Schroeder

09:00 – 09:05

**Enzyme-constrained metabolic modeling of the tripartite synapse reveals how redox and lipid metabolism impacts seizures in a mouse model**

Wheaton Schroeder, Washington State University, USA

09:05 – 09:25

**Improving harvest efficiency and sustainability through integration of single-use centrifugation and chromatographic filtration**

Zach Hyde, ThermoFisher Scientific, USA

09:25 – 09:45

**Microbial rock weathering for CO<sub>2</sub> sequestration: Process and genetic engineering**

Neil Dalvie, Harvard Medical School, USA

09:45 – 10:05

**Leveraging fungal precision fermentation to break cost barriers and enable global access to biologics**

A. Pedro Gonçalves, VTT - Technical Research Centre of Finland

10:05 – 10:35

Coffee Break

**Session 6: Discovery and Manufacturing of Biopharmaceuticals**

Session Chair: Emma Chory

10:35 – 10:40

**TBA**

Emma Chory, Duke University, USA

10:40 – 11:00

**Invited Talk: Programmable platelets as living devices**

Tara Deans, Georgia Institute of Technology, USA

11:00 – 11:20

**Invited Talk: Creating a niche for engineered live biotherapeutics**

Thomas Mansell, Iowa State University, USA

11:20 – 11:40

**Engineering dual expression-dependent molecular AND gates**

Ben Hackel, University of Minnesota, USA

11:40 – 12:00

**Combining aerobic and anaerobic metabolism in a single bioreactor for transformative biochemical production metrics from C<sub>1</sub> feedstocks**

Ben Woolston, Northeastern University, USA

12:00 – 13:00

Lunch

**Session 7: Emerging Technologies and Alternative Perspectives**

Session Chairs: Ashty Karim and Quentin Dudley

13:00 – 13:05

**The Karim Lab: Where synthetic biology meets process design**

Ashty Karim, Northwestern University, USA

13:05 – 13:10

**Cell-free prototyping strategies for plant metabolic engineering**

Quentin Dudley, University of Wisconsin–Madison, USA

13:10 – 13:30

**Invited Talk: The double-edged sword of DNA's extreme information density**

Albert Keung, North Carolina State University, USA

**Wednesday, July 22, 2026 (continued)**

- 13:30 – 13:50      **Invited Talk: Onboarding nonconventional yeasts: Developing the right host for the right product**  
Eric Young, Worcester Polytechnic Institute, USA
- 13:50 – 14:10      **Electro-enhanced bioproduction: Characterization of current-consuming microbes**  
Ken Reardon, Colorado State University, USA
- 14:10 – 14:30      **Development of a microdroplet-based functional genomic screening pipeline combining DNA nanoflowers and PURExpress cell-free expression**  
Minyong Chen, New England Biolabs, USA
- 14:30 – 14:50      **Invited Talk: Empowering synthetic biology by AI and automation**  
Huimin Zhao, University of Illinois at Urbana-Champaign, USA
- 14:50 – 15:10      **Invited Talk: Determinants of host fitness, gene expression, and genetic stability in recombinant E. coli**  
Nik Nair, Tufts University, USA
- 15:10 – 15:40      Coffee Break
- Session 8: Community Building Session**  
Session Chairs: Mark Blenner, Amanda Lewis, and Danielle Tullman-Ercek
- 15:40 – 16:00      **Invited Talk: Mining proteins for mining solutions**  
Scott Banta, Columbia University, USA
- 16:00 – 16:20      **Invited Talk: Reprogramming PYR1 receptors for detection of PFAS “Forever Chemicals”**  
Ian Wheeldon, University of California, Riverside, USA
- 16:20 – 17:00      **Invited Talk: Systematic design of auxotrophic strains and protein engineering: A combined experimental and computational effort**  
Brian Pflieger, University of Wisconsin–Madison, USA  
Costas Maranas, Pennsylvania State University, USA
- 17:00 – 17:10      Stretch break
- 17:10 – 18:10      **Amgen Award Lecture**  
**A novel platform for high-throughput analysis of polymer biodegradation**  
Kris Prather, Massachusetts Institute of Technology, USA
- 18:30 – 19:30      Reception
- 19:30 – 21:30      Conference Banquet

**Thursday, July 23, 2026**

07:00 – 09:00

Breakfast

**Session 9: Biochemical Production Innovations**

Session Chairs: Blake Rasor and Hyeongmin Seo

09:00 – 09:05

**Cell-free prototyping enables low-cost biomanufacturing of butanetriol from microliter to liter scale**

Blake Rasor, North Carolina State University, USA

09:05 – 09:10

**Accelerating design–build–test–learn cycles in synthetic microbial coculture engineering for advanced biomanufacturing**

Hyeongmin Seo, University of Iowa, USA

09:10 – 09:30

**Invited Talk: Enabling models to digital twins for therapeutic protein biomanufacturing & the power of data**

Terry Papoutsakis, University of Delaware, USA

09:30 – 09:50

**Invited Talk: Metabolites and Biomass: A New Economic and Product Architecture for Fermentation**

Bryan Tracy, Superbrewed Foods, USA

09:50 – 10:10

**Biosystems design of modular cells for selective biosynthesis of designer esters**

Cong Trinh, University of Tennessee, USA

10:10 – 10:50

Coffee Break

10:50 – 11:10

**Natural and engineered microbial platforms for the conversion of Sargassum into fuels, chemicals, and natural products**

Jose Avalos, Princeton University, USA

11:10 – 11:30

**Invited Talk: Interactomics-driven discovery of plant natural product biosynthetic pathways in yeast**

Sijin Li, Cornell University, USA

11:30 – 11:50

**Invited Talk: From code to compound: Hacking polyketide synthases for custom chemistry**

Jay Keasling, University of California, Berkeley, USA

Conference close / Departures

Mark Blenner, Amanda Lewis, Danielle Tullman-Ercek