***Preliminary Program***

***(April 15, 2024) – DRAFT SUBJECT TO CHANGE***

**Biochemical and Molecular Engineering XXIII: Accelerating Biotech Solutions to aid a Changing World**

**July 21 – 25, 2024**

**Royal Marine Hotel**

**Dublin, Ireland**

**Conference Co-Chairs**

**Michelle O’Malley**

**University of California at Santa Barbara, USA**

**Brian Pfleger**

**University of Wisconsin, USA**

**Varnika Roy**

**GSK, USA**



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**Engineering Conferences International**

**369 Lexington Avenue, 3rd Floor #389, New York, NY 10017, USA**

**www.engconfintl.org –** **info@engconfintl.org**

**Sunday, July 21, 2024**

12:30 – 14:30 Conference Check-in

14:30 – 14:45 Opening Remarks (Conference Chairs and ECI Liaison)

14:45 – 16:45 **Session 1: Biomanufacturing and building the workforce**

**Optogenetic control of protein production in Pichia pastoris replaces methanol induction with light**

Jose Avalos, Princeton University, USA

**Optimized manufacturing of Adeno-associated Virus for gene therapy**

Nicholas Donohue, APC Ltd, Ireland

**Transferring lab innovation into large scale application by thorough understanding of strains and processes**

Ralf Takors, University of Stuttgart, Germany

**Harnessing genome engineering and automation to engineer next-gen microbial production strains for biologics**

Markus Mund, Sanofi-Aventis Deutschland GmbH, Germany

**Deconstructing synthetic biology: a conceptual approach for training synthetic biologists**

Ashty Karim, Northwestern University, USA

16:45 – 17:15 Coffee Break in Poster Area

17:15 – 18:15 **Keynote**

**TBA**

 Henk Noorman, DSM

18:15 – 19:00 **Rapid-fire Poster Talks 1**

19:00 – 20:30 Dinner

20:30 – 21:00 **Poster Session 1 and Social Hour**

**Monday, July 22, 2024**

07:00 – 08:30 Breakfast

08:30 – 09:30 **Keynote**

**TBA**

 Kelvin Lee, NIIMBL/University of Delaware, USA

09:30 – 12:30 **Session 2: In vitro models & Cell Therapies**

 **NRSF plays a central role in controlling µ-opioid receptor**

 Christina Chan, Michigan State University, USA

 **Predicting outcomes of cardiac progenitor cell differentiation to cardiomyocytes based on integrated transcriptomics and epigenomics**

 Sean Palacek, University of Wisconsin – Madison, USA

10:00 – 10:30 Coffee Break in Poster Area

 **Bioengineering of cancer stem cells for improved disease modelling**

 John Kim, University of Alabama, USA

 **Design of feeder-free processes for natural killer cell expansion**

 Samira Azarin, University of Minnesota, USA

 **How Biotechnology Innovation Drives Benefits to Patients and the Planet: Case Studies from Medicine Design & Manufacturing**

 Philip Dellorco, GSK, USA

12:30 – 14:00 Lunch

14:00 – 16:00 **Session 3:** **Automation in Biotech & Democratizing Biotechnology**

 **A Journey Towards the Development of a Cloud Biofoundry**

 Huimin Zhao, University of Illinois at Urbana-Champaign, USA

**Overcoming the Risks in Biochemical Product Development and Manufacturing** **Through Rapid, Genome Scale Metabolic Engineering**

 Richard Fox, Inscripta, Inc., USA

**Harnessing genome engineering and automation to engineer next-gen microbial production strains for biologics**

Markus Mund, Sanofi-Aventis Deutschland GmbH, Germany

**Accessible DNA construction from oligonucleotide pools using Golden Gate Assembly and Data-optimized Design**

Sean Lund, New England Biolabs, USA

**Growing global bioeconomies through perfusion fermentation**

Kerry Love, Sunflower Therapeutics PBC, USA

16:00 – 16:30 Coffee Break in Poster Area

**Monday, July 22, 2024 (continued)**

16:30 – 18:00 **Session 4:** **Synthetic & Systems Biology I**

 **TBA**

Zengyi Shao, Iowa State University

**Rational design of effective CRISPR-Cas antifungals**

Cong Trinh, University of Tennessee, Knoxville, USA

 **TBA**

 Katie Galloway, Massachusetts Institute of Technology, USA

 **TBA**

Laura Segatori, Rice University, USA

18:00 – 19:00 **Rapid-fire Poster Talks 2**

19:00 – 20:30 Dinner

20:30 – 21:00 **Poster Session 2 and Social Hour / Special After Dinner Session**

**Tuesday, July 23, 2024**

07:00 – 08:30 Breakfast

08:30 – 09:15 **Keynote**

**Evolution of the Irish Biotechnology Sector**

 Barry Heavey, Accenture, Ireland

09:15 – 13:00 **Session 5: Protein & Metabolic Engineering**

 **Hyperstable synthetic miniproteins as developable ligand scaffolds**

 Benjamin Hackel, University of Minnesota, USA

 **MAGMA-seq enables wide mutational scanning of human antibody libraries**

 Tim Whitehead, University of Colorado, Boulder, USA

**Reprogramming plant hormone receptors as biosensors and chemically-inducible genetic circuits**

 Ian Wheeldon, University of California, Riverside, USA

**Engineering enzymes by force: Modulating the catalytic activity of an alcohol dehydrogenase via mechanical forces applied by DNA springs**

 Scott Banta, Columbia University, USA

10:30 – 11:00 Coffee Break in Poster Area

**The role of cofactor recycling in bacterial organelles for sustainable production of biochemicals**

 Danielle Tullman-Ercek, Northwestern University, USA

 **Engineering the Redox Chemistry of Life**

 Han Li, University of California, Irvine, USA

 **TBA**

 Matt DeLisa, Cornell University, USA

 **TBA**

 Anne Robinson, Carnegie Mellon University, USA

 **Production of supply-limited natural product therapeutics using engineered yeast**

 Jay Keasling, University of California at Berkeley, USA

13:00 – 14:15 Lunch

14:30 Excursion to Guinness Storehouse (Bus transportation provided)

 Dinner on your own

**Wednesday, July 24, 2024**

07:00 – 08:30 Breakfast

08:30 – 09:30 **Keynote**

**TBA**

 Corrine Scown, Lawrence Berkeley National Laboratory, USA

09:30 – 12:00 **Session 6: Synthetic & Systems Biology II**

 **Deconstructing and reconstructing polyethylene deconstruction pathways of mealworm gut microbiomes**

 Mark Blenner, University of Delaware, USA

 **Trash to Treasure: Converting Nitrogen Pollutants into Industrial Chemicals**

 Keith Tyo, Northwestern University, USA

10:00 – 10:30 Coffee Break in Poster Area

 **Unraveling the impact of climate change on Arctic diatom-cyanobacteria symbiosis and the global carbon cycle**

 Ranjan Srivastava, University of Connecticut, USA

 **CRISPR interference libraries for genome scale functional genomics**

 Carrie Eckert, Oak Ridge National Laboratory, USA

 **Strangers in a Strange Land: Challenges in the study of cellular interactions**

 Vassily, Hatzimanikatis, EPFL, Switzerland

12:00 – 14:00 Lunch and **Poster Session II**

14:00 – 17:30 **Session 7: Synthetic & Systems Biology III**

 **Optogenetic intensification of insulin secretion in pancreatic beta-cells for diabetes**

 Emmanuel Tzanakakis, Tufts University, USA

 **Highly multiplexed design of an allosteric transcription factor to sense novel ligands**

 Vatsan Raman, University of Wisconsin-Madison, USA

 **Harnessing a systems biology approach to unlock molecular processes behind cellular productivity between different Chinese Hamster Ovary cell hosts**

 Annie Harwood-Stamper, AstraZeneca, UK

15:30 – 16:00 Coffee Break in Poster Area

 **Engineering synthetic anaerobic consortia by division of labour for sustainable biomanufacturing**

 Christopher Lawson, University of Toronto, Canada

**Wednesday, July 24, 2024 (continued)**

**Engineering and Design of Multifunctional Metalloproteinase Inhibitors**

 Maryam Raeeszadeh-Sarmazdeh, University of Nevada, Reno, USA

 **SynBio in the Soil: Tools, Models, and Applications**

 Natalie Farny, Worcester Polytechnic Institute, USA

 **Targeted DNA insertion in plants by CRISPR-associated transposons**

 Gozde Demirer, Caltech, USA

 **TBA**

Aindrila Mukhapadhay, Lawrence Berkeley National Laboratory, USA

17:30 – 18:30 **Amgen Award Lecture**

 **TBA**

 William Bentley, University of Maryland, USA

18:45 – 20:15 Reception

20:15 – 22:30 Gala Dinner

**Thursday, July 25, 2024**

07:00 – 08:30 Breakfast Buffet

08:30 – 09:30 **BEJ Lecture**

 **TBA**

Kevin Solomon, University of Delaware, USA

09:30 – 13:00 **Session 8: Protein & Metabolic Engineering II**

**Development of recombinant platforms for the upcycling of waste to protein-based biopolymers**

 Mattheo Koffas, Rensselaer Polytechnic Institute, USA

 **Unveiling Paclitaxel Biosynthesis: Integrating Engineered Microbial Consortia and Functional Genomics to discover a Crucial Taxane Hydroxylase**

 Leonardo Rios Solis, University College London, UK

 **Harnessing acetogenic bacteria for sustainable chemical production: a systems and synthetic biology approach**

 Benjamin Woolston, Northeastern University, USA

10:00 – 10:30 Coffee Break

 **TBA**

 Kristala Prather, Massachusetts Institute of Technology, USA

 **TBA**

 Mike Betenbaugh, Johns Hopkins University, USA

 **Into Darkness: Understanding non-coding regions of the CHO genome**

 Nicole Borth, BOKU University, Austria

 **Closing Remarks**

13:00 Lunch and Departures