Program

Enzyme Engineering XXVI

May 22 - 27, 2022

Dallas/Fort Worth, TX, USA

Conference Chairs

Andy Bommarius, Georgia Institute of Technology, USA
Vesna Mitchell, Codexis, USA
Doug Fuerst, GSK, USA

Engineering Conference International
32 Broadway, Suite 314 - New York, NY 10004, USA
www.engconfintl.org – info@engconfintl.org
Dallas/Fort Worth Marriott Hotel and Golf Club
3000 Championship Parkway, Roanoke, TX 76177
+1 817-961-0800
Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

ECI BOARD MEMBERS

Barry C. Buckland, President
Mike Betenbaugh
Joye Bramble
Nick Clesceri
Chetan Goudar
Peter Gray
Michael King
Raymond McCabe
Eugene Schaefer
P. Somasundaran

Chair of ECI Conferences Committee: Nick Clesceri

ECI Technical Liaison for this conference: Jeff Moore

ECI Executive Director: Barbara K. Hickernell

ECI Associate Director: Kevin M. Korpics

©Engineering Conferences International
Enzyme Engineering Steering Committee

Chair: Jeff Moore, Merck & Co., Inc., USA
Yasuhisa Asano, Toyama Prefectural University, Japan
Andy Bommarius, Georgia Institute of Technology, USA
Yan Feng, Shanghai Jiao Tong University, China
Doug Fuerst, GSK, USA
Dick Janssen, University of Groningen, The Netherlands
Cheng Jin, Professor, President of Guangxi Academy of Sciences, Nanning, Guangxi, China
Byung-Gee Kim, Seoul National University, Korea
Stefan Lutz, Codexis, USA
Oliver May, DSM Pharmaceuticals, The Netherlands
Vesna Mitchell, Codexis, USA
Pierre Monson, Toulouse White Biotechnology, France
Magali Remaud-Simeon, INSA-University of Toulouse, France
John Wong, Pfizer, retired, USA
Wen Ping Wu, Senior Director, Novozymes, China
Huimin Zhao, University of Illinois, Urbana-Champaign, USA

Enzyme Engineering Organizing Committee

Andy Bommarius, Georgia Institute of Technology, USA
Vesna Mitchell, Codexis, USA
Doug Fuerst, GSK, USA
Magali Remaud-Simeon, INSA-University of Toulouse, France
Pierre Monson, Toulouse White Biotechnology, France
John Wong, Pfizer, retired, USA
Huimin Zhao, University of Illinois, Urbana-Champaign, USA
Yan Feng, Shanghai Jiao Tong University, China
Wen Ping Wu, Senior Director, Novozymes, China
Cheng Jin, Professor, President of Guangxi Academy of Sciences, Nanning, Guangxi, China
Previous conferences in this series:

**Enzyme Engineering**  
August 9-13, 1971  
New England College, Henniker, New Hampshire  
*Conference Chair:*  
L.B. Wingard, Jr., SUNY Buffalo

**Enzyme Engineering II**  
August 5-10, 1973  
New England College, Henniker, New Hampshire  
*Conference Chairs:*  
L. B. Wingard, Jr., University of Pittsburgh  
E. K. Pye, University of Pennsylvania

**Enzyme Engineering III**  
August 3-8, 1975  
Reed College, Portland, Oregon  
*Conference Chairs:*  
E. K. Pye, University of Pennsylvania  
Howard H. Weetall, Corning Glass Works

**Enzyme Engineering IV**  
September 25–30, 1977  
Bad Neuenahr, W. Germany  
*Conference Chairs:*  
G. Manecke, der Freie Universität Berlin  
L. B. Wingard, Jr., University of Pittsburgh

**Enzyme Engineering V**  
July 29-August 3, 1979  
New England College, Henniker, New Hampshire  
*Conference Chairs:*  
Howard H. Weetall, Corning Glass Works  
G. P. Royer, University of Delaware

**Enzyme Engineering VI**  
September 20-26, 1981  
Kashikojima, Japan  
*Conference Chairs:*  
S. Fukui, Kyoto University  
I. Chibata, Tanabe Seiyaku Co.

**Enzyme Engineering VII**  
September 25-30, 1983  
White Haven, Pennsylvania  
*Conference Chair:*  
Previous conferences in this series:

**Enzyme Engineering VIII**
September 22-27, 1985
Elsinor, Denmark
*Conference Chair:*
Klaus Mosbach, University of Lund

**Enzyme Engineering IX**
October 4-9, 1987
Santa Barbara, California
*Conference Chairs:*
Harvey W. Blanch, University of California, Berkeley
Alexander M. Klibanov, Massachusetts Institute of Technology

**Enzyme Engineering X**
September 24-29, 1989
Kashikojima, Japan
*Conference Chair:*
H. Okada, University of Osaka

**Enzyme Engineering XI**
September 22-27, 1991
Kona, Hawaii
*Conference Chairs:*
David A. Estell, Genencor
Douglas S. Clark, University of California, Berkeley

**Enzyme Engineering XII**
September 19-24, 1993
Deauville, France
*Conference Chairs:*
Daniel Thomas, University of Technology of Compiègne
Marie Dominique Legoy, University of Technology of Compiègne

**Enzyme Engineering XIII**
October 15-20, 1995
San Diego, California
*Conference Chairs:*
Jon Dordick, University of Iowa
Alan Russell, University of Pittsburgh

**Enzyme Engineering XIV**
October 12-17, 1997
Beijing, China
*Conference Chairs:*
Yao-Ting Yu, Nankai University
Gao-Xiang Li, Academia Sinica
Previous conferences in this series:

Enzyme Engineering XV
October 10-15, 1999
Kailua-Kona, Hawaii
Conference Chairs:
David Anton, DuPont
Frances H. Arnold, California Institute of Technology
Robert Kelly, North Carolina State University

Enzyme Engineering XVI
October 7-12, 2001
Potsdam, Germany
Conference Chairs:
Frieder W. Scheller, University of Potsdam
Christian Wandrey, Research Center Jülich
Oreste Ghisalba, Novartis Pharma AG

Enzyme Engineering XVII
November 9-14, 2003
Santa Fe, New Mexico
Conference Chairs:
Stephen Benkovic, Pennsylvania State University
Chi-Huey Wong, Scripps Research Institute
Jeffrey Moore, Merck & Co., Inc.
Birgit Kosjek, Merck & Co., Inc.

Enzyme Engineering XVIII
October 9-14, 2005
Gyeong-ju, Korea
Conference Chairs:
Hak-Sung Kim, KAIST, Korea
Ji-Yong Song, LG Life Sciences, Ltd, Korea
Tae-Kwang Oh, Korea Research Inst.of Biosciences & Biotech, Korea
Moon-Hee Sung, Kookmin University, Korea

Enzyme Engineering XIX
September 23-28, 2007
British Columbia, Canada
Conference Chairs:
Romas Kazlauskas, University of Minnesota
Stefan Lutz, Emory University
David Estell, Danisco/Genencor

Enzyme Engineering XX
September 20-24, 2009
Groningen, the Netherlands
Conference Chairs:
Dick Janssen, University of Groningen
Oliver May, DSM Pharmaceutical Products
Andreas Bommarius, Georgia Institute of Technology
Previous conferences in this series:

**Enzyme Engineering XXI**  
September 18-22, 2011  
Vail, Colorado  
Conference Chairs:  
Lori Giver, Codexis  
Steve Withers, University of British Columbia

**Enzyme Engineering XXII**  
September 22-26, 2013  
Toyama, Japan  
Conference Chairs:  
Yasuhisa Asano, Toyama Prefectural University  
Jun Ogawa, Kyoto University  
Yoshihiko Yasohara, Keneka Corp.

**Enzyme Engineering XXIII**  
September 6-11, 2015  
St. Petersburg, Florida, USA  
Conference Chairs:  
Jon Dale Stewart, University of Florida  
Robert DiCosimo, DuPont Industrial Biosciences

**Enzyme Engineering XXIV**  
September 24-28, 2017  
Toulouse, France  
Conference Chairs:  
Pierre Monsan, Toulouse White Biotechnology, France  
Magali Remaud-Simeon, LISBP-INSA, University of Toulouse, France

**Enzyme Engineering XXV**  
October 15-19, 2019  
Whistler, British Columbia, Canada  
Conference Chairs:  
Huimin Zhao, University of Illinois at Urbana-Champaign, USA  
John Wong, Pfizer, USA
Enzyme Engineering Award Winner
Uwe T. Bornscheuer

Professor Uwe Bornscheuer is full professor at the University of Greifswald (Greifswald, Germany) at the Institute of Biochemistry and is head of the Dept. of Biotechnology & Enzyme Catalysis. He received his diploma degree in chemistry in 1990 and his Ph.D. degree in Technical Chemistry in 1993 both from the University of Hannover. In 1994 he performed postdoctoral studies at the University of Nagoya (Nagoya, Japan), then moved to the University of Stuttgart, where he finished his habilitation in Technical Biochemistry in 1998. He has been a professor in Greifswald since 1999. Uwe Bornscheuer has published over 500 peer-reviewed research articles, more than 40 book chapters and has filed 50 patent applications. He has written two seminal teaching books (Hydrolases in Organic Synthesis with Romas Kazlauskas, Biocatalysts and Enzyme Technology with Volker Kasche and Klaus Buchholz) and coedited several other books such as the Protein Engineering Handbook (with Stefan Lutz).

Prof. Bornscheuer has supervised >150 B.Sc./M.Sc./diploma students and 70 Ph.D. students have graduated from his group (currently: 18 Ph.D. students). He has given more than 600 presentations at national and international conferences. Prof. Bornscheuer has received numerous awards such as the European Lipid Technology Award (2021), Chemistry Europe Fellow (2020), Greifswald Research Award (2018), Stephen S. Chang Award (2015), Normann Medal (2014), Chevreul Medal (2012) and the Biocat2008 Award (2008). He is currently member of the Scientific Advisory Boards of the Toulouse White Biotechnology center and of the company Carbios. Bornscheuer is a cofounder and Chairman of the Advisory Board of the company Enzymicals AG in Greifswald. He also served as president of the German Society for Fat Science (DGF), he was Editor-in-Chief of a lipid science journal and is currently head of the
Senate of the University of Greifswald. He is also member of the review board for biochemistry of the German Research Foundation (DFG) and of the Novo Nordisk Foundation.

The major theme in the Bornscheuer group is identifying and optimizing enzymes through protein engineering for applications in organic synthesis (i.e., chiral intermediates for pharmaceuticals using hydrolases or transaminases), lipid modification (healthy fats/oils, oleochemistry), the enzymatic degradation of complex marine polysaccharides and more recently enzymatic recycling of plastics such as PET.

Professor Bornscheuer pioneered many methods of protein engineering, including a range of new high-throughput screening methods, computational tools to design libraries of protein variants and the application of these methods to alter the regio-, chemo- and stereoselectivity of enzymes for various applications. Many projects helped to establish novel environmentally friendly processes. He is recognized worldwide as a leader in enzyme engineering and biocatalysis, where he has developed important new concepts, technologies and biocatalysts.

Past Enzyme Engineering Awardees
1983–WHITE HAVEN, PA, USA — ICHIRO CHIBATA
1985–HELSINGOR, DENMARK — KLAUS MOSBACH
1987–SANTA BARBARA, CA, USA — EPHRIAM KATCHALSKI-KATZIR
1989–KASHIKOJIMA, JAPAN — SABURO FUKUI
1991–KONA, HAWAII, USA — ALEX KLIBANOV
1993–DEAUVILLE, FRANCE — MALCOLM LILLY
1995–SAN DIEGO, CA, USA — MARIA-REGINA KULA / CHRISTIAN WANDREY
1997–BEIJING, CHINA — HARVEY BLANCH
1999–KONA, HAWAII, USA — CHI HUEY WONG
2001–POTSDAM, GERMANY — HIDEAKI YAMADA
2003–SANTA FE, NM, USA — JON DORDICK / DOUG CLARK
2005—GYEONG-JU, KOREA — DEWEY RYU
2007—HARRISON HOT SPRINGS, BC, CANADA — FRANCES H. ARNOLD
2009 – GRONINGEN, THE NETHERLANDS — SAKAYU SHIMIZU
2011 – VAIL, COLORADO, USA — DAVID ESTELL
2013 – TOYAMA, JAPAN — YASUHISA ASANO
2015 – ST. PETERSBURG, FLORIDA, USA – DAN TAWFIK
2017 – TOULOUSE, FRANCE – PIERRE MONSAN
2019 – WHISTLE, CANADA – HUIMIN ZHAO
Conference Sponsors

Abbott
Abbvie
ACS Catalysis
Amano Enzyme Inc.
ATUM
BASF
c-LEcta GmbH
Codexis, Inc.
GSK
Illumina
Japanese Society of Enzyme Engineering
KCAT Enzymatic
Merck & Co., Inc.
Moderna
Novozymes A/S
Proteus By Seqens
Purolite Ltd
Thermo Fisher Scientific
Schedule

Enzyme Engineering XXVI

May 22 - 27, 2022

Dallas/Fort Worth, TX, USA

Engineering Conference International
**Locations and Notes**

- Sunday conference check-in will be in the Trinity Ballroom Foyer.
- Technical sessions will be in Trinity 2 and 3.
- Poster Sessions will be in Trinity 1.
- Meals will be in The Paddock.
- The ECI on site office will be in the Sabine Room.
- Please wear your mask except when giving a presentation or actively eating or drinking. Please maintain physical distancing as much as possible.
- Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, PDAs, watches) is strictly prohibited during the technical sessions, unless the author and ECI have granted prior permission.
- Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).
- Speakers – Please leave at least 3-5 minutes for questions and discussion.
- Questions will be submitted via the Guidebook app that we will be using for the conference. The app will be used in place of the roving microphones we normally have.
- Please do not smoke at any conference functions.
- Turn your mobile telephones to vibrate or off during technical sessions.
- Please write your name on your program so that it can be returned to you if lost or misplaced.
- After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.
- Emergency Contact Information: Because of privacy concerns, ECI does not collect or maintain emergency contact information for conference participants. If you would like to have this information available in case of emergency, please use the reverse side of your name badge.
Sunday, May 22, 2022

14:00   Conference check-in

**Opening Session**

17:00 – 17:15  Chairs welcome and opening remarks
Andy Bommarius, Georgia Institute of Technology, USA
Vesna Mitchell, Codexis, USA
Doug Fuerst, GSK, USA

17:15 – 18:15  **Plenary Talk**
Using machine learning to improve protein function
Andrew Ellington, The University of Texas at Austin, USA

19:00 – 20:30  Dinner
Monday, May 23, 2022

07:00 – 08:30  Breakfast

**Session 1: Enzyme Engineering in Synthetic Biology**
*(Sponsored by Illumina)*
Chair: Daniela Grabs, Arzeda, USA

08:30 – 09:15  Enzyme engineering for metabolic engineering
Kristala L.J. Prather, Massachusetts Institute of Technology, USA

09:15 – 09:45  Exploring constraints of sequence space in search of optimal enzymes
Sridhar Govindarajan, ATUM, USA

09:45 – 10:05  *In silico* screening of transaminase using semi-empirical QM/MM approach
Marc Hayes, Enzymaster, USA

10:05 – 10:45  Coffee Break *(Sponsored by the Japanese Society of Enzyme Engineering)*

10:45 – 11:15  Engineering enzymes to produce high purity synthetic DNA
Anders Knight, Codexis, USA

11:15 – 11:45  A deep learning tool for protein engineering
Huimin Zhao, University of Illinois at Urbana-Champaign, USA

11:45 – 12:15  Engineering enzymes for green manufacturing of noncanonical amino acids
David Romney, Aralez Bio, USA

12:15 – 13:45  Lunch & Networking

**Session 2: Computational Tools for Enzyme Engineering**
Chair: Sridhar Govindarajan, ATUM, USA

13:45 – 14:30  Evaluation of sequence/activity relationships for more than 50 proteins: Implications for natural and directed evolution, protein engineering and machine learning algorithms
David Estell, Genencor International, Inc., USA

14:30 – 15:00  Advanced database mining integrating sequence and structure bioinformatics with microfluidics challenges enzyme engineering
Zbynek Prokop, Masaryk University, Czech Republic

15:00 – 15:20  Helix engineering: Combining the power of 3DM with Al to disrupt protein engineering
Stephan Heijl, Bio-Product, Netherlands

15:20 – 16:00  Coffee Break
Monday, May 23, 2022 (continued)

16:00 – 16:30  Engineering a C4 fructose epimerase for production of tagatose
                Kyle Roberts, Arzeda, USA

16:30 – 16:50  Powering computational enzyme design with natural evolutionary
                information
                Wenjun Xie, University of Southern California, USA

16:50 – 17:10  Engineering proteins with 3D convolutional neural networks
                Daniel Diaz, The University of Texas at Austin, USA

17:10 – 17:30  The use of machine learning to navigate the sequence-activity landscape
                during directed evolution campaigns
                Oscar Alvizo, Codexis, USA

18:00 – 19:30  Dinner & Networking

19:30 – 21:30  Poster Session & Chairs’ Reception
Tuesday, May 24, 2022

07:00 – 08:30 Breakfast

Session 3: New Technologies for Enzyme Engineering
Chair: Misha Golynskiy, Illumina, USA

08:30 – 09:15 Leveraging microfluidics for linking protein sequence to function in high-throughput
Polly Fordyce, Standard University, USA

09:15 – 09:45 Fast evolution of active and/or enantioselective enzymes with a microfluidic enzyme screening platform
Zhi Li, National University of Singapore, Singapore

09:45 – 10:15 GENOSCALER™: A Next-Generation high throughput enzyme, pathway, and genome engineering platform
Richard Fox, Infinome, USA

10:15 – 10:45 Coffee Break (Sponsored by Purolite Ltd)

10:45 – 11:05 The impact of bioinformatics on industrial enzyme engineering
Andreas Vogel, c-LEcta GmbH, Germany

11:05 – 11:25 High-throughput enzyme engineering for commercial-scale production of natural products
Irina Koryakina, Amyris, Inc., USA

11:25 – 11:45 A hyperstable glycosyltransferase for blue denim dyeing
Gonzalo Bidart, Technical University of Denmark, Denmark

11:45 – 12:05 Immobilized enzymes for green pharmaceutical applications
Fred Ghanem, Purolite, USA

12:05 – 13:45 Lunch & Networking

Session 4: Novel Enzymes and Enzyme Activity
Chair: Ee Lui Ang, Singapore Institute of Food and Biotechnology Innovation, Singapore

13:45 – 14:30 Photoenzymatic Catalysis - Using light to reveal new enzyme functions
Todd Hyster, Cornell University, USA

14:30 – 15:00 Design and evolution of enzymes with non-canonical catalytic mechanisms
Anthony Green, University of Manchester, United Kingdom

15:00 – 15:20 Engineering substrates of transglutaminase using the Glutamine-Walk Strategy for specific modification of IgG1 antibodies
Joelle Pelletier, University of Montreal, Canada

15:20 – 16:00 Coffee Break
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:00 – 16:45</td>
<td><strong>Boosting squalene-hopene cyclase towards an industrial biocatalyst</strong></td>
</tr>
<tr>
<td></td>
<td>Bernhard Hauer, University of Stuttgart, Germany</td>
</tr>
<tr>
<td>16:45 – 17:15</td>
<td><strong>Carboxyesterase-mediated amidation</strong></td>
</tr>
<tr>
<td></td>
<td>James Morrison, GSK, USA</td>
</tr>
<tr>
<td>17:15 – 17:35</td>
<td><strong>New techniques for the production of high-performing industrial enzymes</strong></td>
</tr>
<tr>
<td></td>
<td>Michael Liszka, BASF Enzymes LLC, USA</td>
</tr>
<tr>
<td>17:35 – 17:55</td>
<td><strong>Overcoming challenges in organofluorine biosynthesis by engineered fluorinases</strong></td>
</tr>
<tr>
<td></td>
<td>Pravin Kumar, Kcat Enzymatic Private Limited, India</td>
</tr>
<tr>
<td>18:00 – 19:30</td>
<td>Dinner &amp; Networking</td>
</tr>
<tr>
<td>19:30 – 21:30</td>
<td>Poster Session</td>
</tr>
</tbody>
</table>
**Wednesday, May 25, 2022**

07:00 – 08:30  Breakfast

**Session 5: Process Modeling in Enzyme Engineering**  
Chair: Huimin Zhao, University of Illinois at Urbana-Champaign, USA

08:30 – 09:15  
**Modelling biocatalytic processes to accelerate enzyme and process development**  
John Woodley, Technical University of Denmark, Denmark

09:15 – 09:45  
**Benefits of reaction engineering in biocatalysis**  
Zvjezdana Findrik Blažević, University of Zagreb, Croatia

09:45 – 10:05  
**Towards engineering an efficient and thermostable α-amino ester hydrolase (AEH): Minimizing substrate inhibition and deactivation for continuous production of cephalexin**  
Colton Lagerman, Georgia Institute of Technology, USA

10:05 – 10:45  Coffee Break  
(Sponsored by Merck & Co., Inc.)

**Session 6: Enzymes and Nucleic Acids**  
Chair: Sonya Clark, 10xGenomics, USA

10:45 – 11:30  
**Biocatalytic synthesis of nucleoside and nucleotide therapeutics**  
John McIntosh, Merck, USA

11:30 – 12:00  
**Biocatalytic oligonucleotide synthesis technology-BOOST**  
Jill Caswell, Almac, USA

12:00 – 12:20  
**Biocatalytic approaches to therapeutic oligonucleotide manufacture**  
Sarah Lovelock, University of Manchester, United Kingdom

12:20 – 12:40  
**Optimizing enzyme production to support commercial mRNA manufacturing**  
Juozas Siurkus, Thermo Fisher Scientific, Lithuania

12:40  
Lunch / Free afternoon for networking & sightseeing

Dinner on your own
Thursday, May 26, 2022

07:00 – 08:30 Breakfast

Session 7: Enzyme Engineering for Environmental Applications
Chair: Michael Liszka, BASF Enzymes LLC, USA

08:30 – 09:15 PET recycling: From enzyme engineering to a first industrial unit
Alain Marty, Carbios, France

09:15 – 09:35 Engineering enzymes for microbial control: Cell-free methods for enhancing antimicrobial efficacy through directed evolution
Erika Milczek, Curie Co. Inc., USA

09:35 – 09:55 Directed evolution of an efficient and thermostable PET depolymerase
Elizabeth Bell, University of Manchester, United Kingdom

09:55 – 10:15 Engineering of a redox neutral enzyme cascade for production of aliphatic diamines
Hannah Valentino, Oak Ridge National Lab, USA

10:15 – 11:00 Coffee Break

Poster Talks
Chairs: Richard Fox, Infinome Biosciences, USA
Zhi Li, National University of Singapore

11:00 – 11:05 Announcement of Winners of the Poster Competition

11:05 – 11:20 Winner 1

11:20 – 11:35 Winner 2

11:35 – 11:50 Winner 3

12:00 – 13:30 Lunch

Session 8: In Memoriam - Hideaki Yamada
Chair: Jun Ogawa, Kyoto University, Japan

13:30 – 14:10 Memories of late professor Hideaki Yamada, a giant in enzyme engineering, and successive activities stemmed from his philosophy
Jun Ogawa, Kyoto University, Japan

14:10 – 14:50 Continuity and change in screening for industrial enzymes and protein engineering- A tribute to the late Professor Hideaki Yamada
Yasuhisa Asano, Toyama Prefectural University; ERATO, JST, Japan

14:50 – 15:10 Basics and applications of gut bacterial lipid-metabolizing enzymes- A tribute to the late Professor Hideaki Yamada
Shigenobu Kishino, Kyoto University, Japan

15:10 – 15:30 Development of P450-BM3 using molecular dynamics simulations- A tribute to the late Professor Hideaki Yamada
Satoru Ishihara, Amano Enzyme Inc., Japan
Thursday, May 26, 2022 (continued)

15:30 – 16:00 Coffee Break

**Session 9: In Memoriam - Dan Tawfik**
Chair: David Baker, University of Washington, USA

16:00 – 16:30 **Protein design using deep learning**
David Baker, University of Washington, USA

16:30 – 17:00 **Making better proteins: Learning from the best**
Olga Khersonsky, Weizmann Institute of Science, Israel

17:00 – 17:30 **Adventures on the routes of enzyme evolution – In memoriam Dan Tawfik**
Nobu Tokuriki, University of British Columbia, Canada

17:30 – 18:00 **Evolutionary-guided cofactor engineering**
Paola Laurino, Okinawa Institute of Science and Technology Graduate University, Japan

**Enzyme Engineering Award Presentation and Lecture**

18:00 – 18:10 **Introduction and Presentation of the Enzyme Engineering Award**
David Estell, Genencor International, Inc., USA
Jeff Moore, Merck & Co., Inc., USA
Joelle Pelletier, University of Montreal, Canada

18:10 – 19:10 **Enzyme Engineering Award Lecture**
*Biocatalysis and enzyme engineering – a personal view on the last three decades*
Uwe Bornscheuer, Greifswald University, Germany

19:30 – 22:00 Reception and Banquet

---

**Friday, May 27, 2022**

07:00 Breakfast & Departure
Poster Presentations

1. **Design and evolution of enzymes for the Morita-Baylis-Hillman reaction**  
   Amy Crossley, University of Manchester, United Kingdom

2. **An engineered cytidine deaminase for biocatalytic production of a key intermediate of the COVID-19 antiviral Molnupiravir**  
   Ashleigh Burke, University of Manchester, United Kingdom

3. **Galectin-Anchored indoleamine 2,3-dioxygenase tissue-targeted therapeutic enzyme suppresses local inflammation in multiple animal models**  
   Benjamin Kesselowsky, University of Florida, USA

4. **Biocatalytical access to amides**  
   Erna Zukic, acib, University of Graz, Austria

5. **Engineering of styrene oxide isomerase for enhanced production of (S)-2-arylpionaldehydes**  
   Joel Choo Ping Syong, National University of Singapore, Singapore

6. **Assessment of C-type halohydrin dehalogenase stability**  
   Nevena Milčić, University of Zagreb, Croatia

7. **Screening millions of droplet-compartmentalized single cells with Xdrop®**  
   Peter Mouritzen, Samplix Aps, Denmark

8. **Determination of the rate limiting step during zearalenone hydrolysis by ZenA**  
   Sebastian Fruhauf, DSM - BIOMIN Research Center, Austria

9. **Efficient enzyme discovery from complex environmental microbiota using microbial single-cell sequencing**  
   Soichiro Tsuda, bitBiome Inc., Japan

10. **A cell-free platform for the directed evolution of toxic enzymes and proteins**  
    Will Shindel, Curie Co, USA

11. **FireProt ASR: Automated design of ancestral proteins**  
    Zbyněk Prokop, Masaryk University, Czech Republic

12. **EnzymeMiner: Exploration of sequence space of enzymes**  
    Zbyněk Prokop, Masaryk University, Czech Republic

13. **Unlocking the key to successful commercialization by coupling the power of biocatalysis, strain engineering, and application studies**  
    Khin Oo, Fornia BioSolutions, Inc., USA

14. **Ketoreductase immobilization for batch and flow processes**  
    Fred Ghanem, Purolite, USA

15. **In silico screening of transaminase using semi-empirical QM/MM approach**  
    Marc Hayes, Enzymaster, USA
16. Toward engineering an efficient and thermostable α-Amino Ester Hydrolase (AEH): Minimizing substrate inhibition and deactivation for continuous production of cephalixin
   Colton Lagerman, Georgia Institute of Technology, USA

17. Engineering of a redox neutral enzyme cascade for production of aliphatic diamines
   Hannah Valentino, Oak Ridge National Lab, USA

18. Overcoming challenges in organofluorine biosynthesis by engineered fluorinases
   Pravin Kumar, KCAT Enzymatic Private Limited, India

19. 7D-Grid-AI-Technology: A technology that translates enzymes from a computer to business with limited lab experiments
   Pravin Kumar, KCAT Enzymatic Private Limited, India

20. Insilico guided CRISPR-Cas driven enzyme engineering framework: An automated and efficient enzyme engineering method
    Pravin Kumar, KCAT Enzymatic Private Limited, India

21. QM/MM Studies of The phenylalanine ammonia-lyase variants helped to understand the mechanistic role of the mutations
    Pravin Kumar, KCAT Enzymatic Private Limited, India

22. discovery of CDX-6512, a gastrointestinal-stable methionine-gamma-lyase as a potential orally-administered enzyme therapy for homocystinuria
    Leann Teadt, Codexis, Inc., USA