



GLOBAL  
BIOECONOMY  
SUMMIT 2020



## Joint US-European Webinar on Biocatalysis and Bioeconomy Education

**Monday, 16<sup>th</sup> August 2021 at 16:00 – 18:00 CET**

**Welcome Address:** Willi Meier DECHEMA, Frankfurt

**Chairs:** Jan Lucht, SKB, scienceindustries, Zurich; Karsten Schürrie, DECHEMA, Frankfurt; Roland Wohlgemuth, Lodz University of Technology, SKB, ESAB Chair

### PROGRAMME

**Prof. Dr. Andreas Bommarius, Georgia Tech, School of Chemical and Biomolecular Engineering, Atlanta, USA**

#### **Trends in Interfacing Biobased Industry requirements with Bioeconomy Education - Case study: Chem. Eng. at Georgia Tech**

The presentation covers a case study of how an American public university, here the Georgia Institute of Technology in Atlanta, GA, integrated Biotechnology into its engineering education and which other measures it took to educate its students about business and entrepreneurship. Discussion with all stakeholders, such as the students themselves and potential employers, is key to developing a robust and challenging, yet up-to-date and highly beneficial curriculum.

**Prof. Dr. Stefan Lutz, Senior Vice President Research, CODEXIS, Redwood City, USA**

#### **Interfacing bio-based industry requirements with bioeconomy education**

The integration of key business principles in academic training is an essential feature in preparing the next generation of innovators and entrepreneurs. Beyond instilling scientific curiosity, problem solving skills, and a desire for life-long learning, the preparation of students for today's bioeconomy should include elements of business, elevate the importance of hard and soft leadership skills, and emphasize the importance of clear and effective communication to diverse audiences including scientists, investors and customers.

**Prof. Dr. Blake A. Simmons, Biological Systems and Engineering, Lawrence Berkeley National Laboratory, Joint BioEnergy Institute, Adjunct Professor at University of California, Berkeley, USA and University of Queensland, Australia**

#### **Educating the Workforce that will Drive the Bioeconomy - A Case Study**

While the 21st century will undoubtedly be recognized for advances in the biological and life sciences, another important element in magnifying the positive impacts of these advances is to enable the global bioeconomy, especially in the realms of developing advanced biomanufacturing technologies to replace and displace current manufacturing techniques that are energy intensive and have a negative effect on the environment. One critical aspect that will determine how quickly these new biomanufacturing technologies are deployed in the marketplace is a diverse and skilled workforce capable of ensuring safe and sustainable operations at scale. I will highlight recent joint efforts between UC-Berkeley and Lawrence Berkeley National Laboratory to address this critical need, with a focus on UC Berkeley's Master of Bioprocess Engineering (MBPE) program.

## PROGRAMME

**Prof. Dr. Jennifer A. Littlechild, Henry Wellcome Building for Biocatalysis, Biosciences, College of Life and Environmental Sciences, University of Exeter, United Kingdom**

### **Enzymes, Biocatalysis and the Bioeconomy**

Biocatalysis is of ever increasing importance for the bioeconomy of the future. It is now featured as part of our everyday life. Nature's catalysts, enzymes, carry out the important reactions in the biosynthesis of new drugs for the healthcare industry. They are used in recycling of waste materials to make new chemicals and biomaterials that contribute to the circular economy where nothing goes to waste. They are of importance to the detergent, cosmetic and food industries. They are also being developed for carbon dioxide capture to protect global warming.

This presentation will highlight some novel enzyme catalysts developed at Exeter which are already involved in industrial processes or are under development.

It will also introduce the establishment of Research Centres at Exeter University where an interdisciplinary approach is being developed for research and education of students and the general public in these important areas of sustainability, climate change and circular economy.

**Prof. Dr. Volker Sieber, Technical University of Munich, Germany**

### **How to shape education for a sustainable bioeconomy? – A case study from Germany.**

Bioeconomy is about the transformation of the society from being fossil based with dead end products and life styles towards a sustainable, circular form. Such a transformation requires changes in a multitude of areas from the supply of tomorrow's raw materials, availability of efficient production routes, management and economics based on new values and costs, to name just a few. All these areas are closely linked and the involved scientists, engineers and managers are required to have a strong trans- and interdisciplinary thinking, which requires a deep and broad knowledge alike. University education has been usually focused onto unilateral serial education in rather specialized fields.

The Technical University of Munich (TUM) is one of world's leading universities ranking among Top 50 in many fields. To advance research and education in bioeconomy TUM has founded a new campus, that is dedicated to the subject of bioeconomy and that brings together scientists from all the different disciplines under one roof: the TUM Campus Straubing for Biotechnology and Sustainability.

For education in the field of bioeconomy we had started a Master's program "Renewable Resources" in 2008 and a Bachelor's program under the same name in 2013. Both had originally been designed to be highly interdisciplinary. However, these programs partially lacked depths. We have now designed a series of highly interlinked more specialized yet broad study programs in science, engineering, materials, economics and management, which convey the necessary background and install the right and critical way of thinking for the coming bioeconomy experts. These programs have seen a rapid acceptance and a great influx from international students.

## ABOUT THE SPEAKERS

**Andreas Bommarius** is Professor of Chemical & Biomolecular Engineering at Georgia Tech. Trained in Chemistry (TU Munich, 1984) and Chemical Engineering (PhD, MIT 1989), his experience includes 10 years in industry (Degussa (now Evonik), Germany) and more than 20 years at Georgia Tech. His current research interests focus on redox and beta-lactam-coupling enzymes, protein stability, and continuous manufacturing.



**Stefan Lutz** joined Codexis in 2020 as the Senior Vice President of Research to lead the company's research team advancing the discovery of proteins. Prior to his arrival in Redwood City, he was a Professor and Chair of the Chemistry Department at Emory University, having joined the university in 2002 and ascending to Chemistry Department Chair in 2014. In addition to his academic work, he has consulted for AgriMetis and served on the scientific advisory boards of ZuvaChem, CODA Genomics Inc. and SynBioX Inc. Stefan has co-authored more than 65 articles published in peer-reviewed journals and six technical books and journals. He holds six patents and is a frequent lecturer and speaker. Dr. Lutz received a B.Sc. in chemistry/chemical engineering from the Zurich University of Applied Sciences, an M.Sc. in Biotechnology from the University of Teesside and a Ph.D. in chemistry from the University of Florida. He was a postdoctoral fellow at Pennsylvania State University.



**Blake A. Simmons** is the Director of the Biological Systems and Engineering Division at Lawrence Berkeley National Laboratory ([biosciences.lbl.gov](http://biosciences.lbl.gov)). He also serves as the Chief Science and Technology Officer and Vice-President of the Deconstruction Division at the Joint BioEnergy Institute ([www.jbei.org](http://www.jbei.org)), a DOE Office of Science funded project tasked with the development and realization of next-generation "drop-in" biofuels and bioproducts produced from sustainable, non-food lignocellulosic biomass. He has over 350 publications, and 50 patents and patent applications. His work has appeared in the New York Times, CNN, the Wall Street Journal, the San Francisco Chronicle, iBiology, Fast Company, and the KQED televised science program Quest.



## ABOUT THE SPEAKERS

**Jennifer A. Littlechild** is Professor of Biological Chemistry and has established the Henry Wellcome Centre for Biocatalysis at Exeter University in 2003. She carried out her PhD in Biophysics at Kings College, London University followed by a postdoctoral fellowship at Princeton University, USA. This was followed by a Max-Planck position in Berlin Germany before she returned to the UK to Bristol University and then to Exeter University in 1991. Her research studies involve the structural and mechanistic characterisation of a range of enzymes from thermophilic bacteria and Archaea that have industrial applications. She has published over 220 publications in refereed high impact journals and presented her research work internationally. She has coordinated the EU project THERMOGENE and was a partner in a consortium grant HOTZYME and currently RADICLEZ. She has been involved with ERA-CoBiotech projects HOTSOLUTE and THERMOK FOSC which started in 2021. In the UK she is funded from BBSRC, EPSRC, DEFRA and Innovate UK. These grants involve both large industrial companies and SME enterprises. She has supervised over 40 PhD students many industrially linked. She is the UK representative and vice chair of the European Society of Applied Biocatalysis.



**Volker Sieber** studied chemistry at the University of Bayreuth and the University of Delaware. After obtaining his doctorate in biochemistry, he went to the California Institute of Technology as a research fellow with Nobel Laureate (2018) Frances H. Arnold. Following a brief sojourn at McKinsey & Co., Prof. Sieber held a number of positions in the chemical industry between 2001 and 2008 (Degussa, Süd-Chemie). He has been a full professor at the Technical University of Munich since late 2008. In parallel, since 2009 he has built up and headed a Fraunhofer Institute branch in the area of bio-, chemo- and electrocatalysis. Since 2017 Prof. Sieber is Rector of the TUM Campus Straubing for Biotechnology and Sustainability where the Technical University of Munich concentrates its research and teaching in bioeconomy. Since 2015 Prof. Sieber has been one of the founding members of the Bioeconomy council for the government of the Free State of Bavaria and acted as its spokesperson.



### NEXT ESAB WEBINARS

**ESAB** aims to promote the development of Applied Biocatalysis and takes initiatives in areas of growing scientific and industrial interest in the field.

Schedule and Topics of next ESAB webinars:

3 Sept. 2021, 14.00-16.00 CET  
Problems and tools for standardised reporting of biocatalysis experiments organized by Peter Halling

22 Oct. 2021, 14.00-16.00 CET  
Synthetic Biology and Metabolic Engineering Tools and Methodologies organized by Frangiskos Kolis and Roland Wohlgemuth

### HOW TO JOIN ESAB

You are cordially invited to join ESAB online *via* <https://esabweb.org/Join+us/Application+form.html>

Personal membership is free.

ESAB, founded in 1980, has the mission of promoting the development of Applied Biocatalysis throughout Europe. The aims of ESAB are to promote initiatives in areas of growing scientific and industrial interest of importance within the field of Applied Biocatalysis.

Further information can be found on the ESAB website [www.esabweb.org](http://www.esabweb.org)  
[ESAB - European Society of Applied Biocatalysis \(esabweb.org\)](http://www.esabweb.org)