# Advanced Course Biocatalysis and Protein Engineering

9-13 April 2018

## Aim

The aim of the course is to familiarize participants with the integrated, interdisciplinary approach required to utilize the catalytic potential of enzymes and whole cells for the production of useful compounds. Organic chemists, enzymologists, microbiologists and (bio)chemical engineers from the faculty staff of Delft University of Technology and other universities, together with invited international experts from industry, will offer a selection of theory and practice. In this way, the course will provide an intensive and in-depth treatment of the state of the art and the necessary link between fundamental knowledge and practical applications in industrial scale processes.

## Course description

This one-week course is intensive and has long days. To ensure active participation by those attending, a combination of theoretical (lectures), practical demonstrations and practical work (exercises, case study) is offered.

**Lectures**
Lectures are setup to be interactive but active participation of the participants is of course vital to the success of the lectures.
During the lectures attention will be paid to the following questions:

- When is biocatalysis the preferred method?
- Which type of biocatalysis should be used?
- How to obtain / improve this biocatalyst?
- Which reaction types can be carried out?
- How to perform and monitor the conversion?
- How to optimize the reaction conditions?

**Workshop and case study**
For a better understanding of the lectures, the theory is applied in exercises on Tuesday in a case study. The workshops on Enzyme visualization / bioinformatics will be offered in two different levels, so even advanced participants will definitely be challenged!

The course will be given in English.

## Who should attend?

This Advanced Course is aimed at professionals (MSc, PhD or equivalent experience) in biochemical engineering, organic chemistry, fermentation technology, biochemistry or microbiology with a basic working knowledge of the other disciplines. The course is primarily aimed at those already employed in industry who wish to up-date their theoretical knowledge and practical insight in this field. In addition, this Advanced Course is an option in the two-year postgraduate programs of Delft University of Technology.

## Duration / Location

This Advanced Course will be given on
**Monday, 9 April – Friday, 13 April 2018**

The course will be held at the
**Department of Biotechnology**
**Delft University of Technology**
**Van der Maasweg 9**
**2629 HZ Delft**
**The Netherlands**
P +31 15 278 1922
E biotechdelt@tudelft.nl
W www.biotechnologycourses.nl

# Accommodation

Hotel accommodation can be arranged at your request, addressed to biotechdelft@tudelft.nl.

Lunches, the buffet on Monday, April 9th and the course dinner on Thursday, April 12th will be provided. For the other meals a variety of restaurants may be found in the centre of the city.

# Program, 9 – 13 April 2018
## Advanced Course on Biocatalysis and Protein Engineering

### Monday, 9 April 2018

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|---|---|
| 08.45 | Registration |
| 09.00 | Outlook of the course<br>*Isabel Arends* |
| 09.15 | Keynote lecture: The future of Biocatalysis<br>*Isabel Arends* |
| 10.30 | Industrial Applications of Biocatalysis for Antibiotic and Pharmaceutical synthesis<br>*Burghard Konig* |
| 11.45 | Immobilization of biocatalysts<br>*Roger Sheldon* |
| 12.30 | Lunch |
| 13.30 | Continuation: Immobilization of biocatalysts<br>*Roger Sheldon* |
| 14.45 | From natural environment to biocatalyst<br>*Gerard Muyzer* |
| 16.00 | Engineering nature's enzyme repertoire for food, pharma and biofuels<br>*René de Jong* |
| 17.00 | Social drink and buffet |

### Tuesday, 10 April 2018

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|---|---|
| 09.00 | Themes of the day |
| 09.15 | Biocatalysis and sustainability<br>*John Woodley* |
| 10.45 | Reactions of serine hydrolases<br>Case study<br>*Ulf Hanefeld* |
| 12.30 | Lunch |
| 14.45 | Principles of enantioselection: mathematics and applications<br>*Adrie Straathof* |
| 15.45 | Rational design and directed evolution of enzymes<br>*Uwe Bornscheuer* |
| 17.00 | Reaction engineering: optimizing the medium for enzymatic conversions<br>*Adrie Straathof* |
| 18.00 | End of day |

## Wednesday, 11 April 2018

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|---|---|
| 09.00 | Themes of the day |
| 09.15 | Protein engineering: enzyme stability/specificity<br>*Dick Janssen* |
| 10.30 | Genomic databases, bioinformatics and biocatalysis<br>*Dick Janssen* |
| 11.30 | Enzyme-catalysed synthesis of C-C bonds: Hydroxynitrile lyase/Oxynitrilase<br>*Ulf Hanefeld* |
| 13.00 | Lunch |
| 14.15 | Biocatalysis – a tool for sustainable production of ester-based surfactants<br>*Oliver Thum* |
| 15.30 | Computer practical: Pymol<br>*Peter Leon Hagedoorn* |
| 18.00 | End of day |

## Thursday, 12 April 2018

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|---|---|
| 09.00 | Themes of the day |
| 09.15 | From biotransformation towards industrial process<br>*Adrie Straathof* |
| 11.30 | Non-aqueous biocatalysis<br>*Ulf Hanefeld* |
| 12.30 | Lunch |
| 13.45 | Industrial biocatalysis in food and pharma<br>*Alessandra Basso* |
| 15.15 | Enzymes for lignocellulose degradation<br>*Mirjam Knavel* |
| 18.00 | Course dinner |

## Friday, 13 April 2018

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|---|---|
| 09.00 | Themes of the day |
| 09.15 | Fundamentals and application of BioRedoxCatalysis<br>*Stephan Lütz* |
| 11.15 | Biocatalytic oxidation and oxyfunctionalization reactions<br>*Frank Hollmann* |
| 12.15 | Lunch |
| 14.00 | Selection and development of biocatalysts for the preparation of fine chemicals<br>*Bernhard Hauer* |
| 15.00 | An industrial perspective from flavor and fragrances<br>*Andreas Taglieber* |
| 16.00 | Evaluation of the course<br>*Ulf Hanefeld* |
| 16.30 | Farewell drinks |

# Fees and Registration

Please register via the website www.biotechnologycourses.nl to attend the course. Deadline for application is **26 March 2018**. Applicants will be handled in order of the date of receipt.

The course fee is:
€ 2.500 in case booking is made before **12 February 2018** or
€ 2.750 in case booking is made after this date.
In the event of cancellation before 26 February 2018, a full refund will be granted, after this date, a 25% fee charge can be made.
To facilitate enrolment of young PhD-students from universities, a limited number of fellowships is available. The course fee with fellowship is € 1.250. To apply, please include a copy of your registration as a PhD-student from your university.

The fee includes course materials, lunches, the buffet on Monday and the course dinner on Thursday. The fee does not cover other meals and lodging.

When the number of participants is too low to have a fruitful course, BioTech Delft will cancel the event no later than six weeks before the start of the course. The course fee will be reimbursed within three weeks after cancellation. In case a speaker will not be able to present his/her lecture due to unforeseen circumstances, BioTech Delft will arrange an equivalent replacement.

Hotel accommodation can be arranged at your request.

Preparatory texts will be send a month before the start of the course. The complete digital course book will be supplied at the start of the course.

# Advanced Course Biocatalysis & Protein Engineering

- I wish to attend the course of 9 – 13 April 2018
- I would like to receive information of the other courses of the **Institute BTD**
- Please, send me announcements of the future **Advanced Course Biocatalysis & Protein Engineering**

Family name, title, Mr/Ms ..... First name .....
Organisation/Company .....
Address .....
.....
Phone .....
Email address.....
Educational background .....
Diet wishes.....
Date / Signature .....

# Board of the course

COURSE BOARD
Isabel Arends
Biocatalysis
Delft University of Technology
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Ulf Hanefeld
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Wageningen University & Research
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Dr. Burghard König
Koenig & Funk Biotech Ltd., CEO
Berlin, Germany

Dr. Stephan Lütz
Novartis Pharma AG
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Prof. Gerard Muyzer
University of Amsterdam
Faculty of Science
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Prof. Roger Sheldon
CLEA Technologies B.V.
Delft, the Netherlands

Dr. Andreas Taglieber
Firmenich SA
Geneva, Switzerland

Dr. Oliver Thum
Evonik Industries AG
Essen, Germany

Prof. John Woodley
Technical University Denmark
Lyngby, Denmark

COORDINATORS WORKSHOP
Dr. Peter Leon Hagedoorn
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Delft, the Netherlands

## Course coordination

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*Vincent Renken, MSc, MSc(Ed)*
BioTech Delft, Delft University of Technology
Department of Biotechnology
Delft, the Netherlands

**Institute Biotechnology Academy Delft**
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**The Netherlands**

The institute **BioTech Delft** constitutes a joint initiative in biotechnological post-graduate education of Delft University of Technology and Leiden University and is coordinated from the department of Biotechnology of Delft University of Technology.

BSDL-EDU was founded in 1987 and has since then very successfully organised various types of postdoctoral education: the Advanced Course Quality Management in Pharma and Biotech, the PDEng programmes and the Advanced Courses in biotechnology. The Advanced Course Quality Management in Pharma and Biotech was developed by BSDL-EDU and is currently organised by PAO Farmacie. The PDEng programmes are special two-year postgraduate programmes that are aimed at those who wish to tailor their own specialisation to the needs of multidisciplinary biotechnological research and design, and lead to the degree of 'Professional Doctorate in Engineering'. Originally developed by BSDL-EDU, these programmes are now hosted by the 3TU School for Technological Design / Stan Ackermans Institute.

Currently BSDL-EDU offers various Advanced Courses covering the multidisciplinary spectrum of biotechnology:

**MICROBIAL PHYSIOLOGY AND FERMENTATION TECHNOLOGY**
**BIOPROCESS DESIGN**
**DOWNSTREAM PROCESSING**
**ENVIRONMENTAL BIOTECHNOLOGY**
**GENOMICS IN INDUSTRIAL BIOTECHNOLOGY**
**METABOLOMICS FOR MICROBIAL SYSTEMS BIOLOGY**

## Further information

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## Address

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