Advanced Course Biocatalysis and Protein Engineering

4 – 8 April 2016

Aim

The Advanced Course 'Biocatalysis and Protein Engineering' aims 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, 4 April – Friday, 8 April 2016

The course will be held at the
Department of Biotechnology
Delft University of Technology
Julianalaan 67
2628 BC Delft
The Netherlands
P +31 15 278 1922
E bsdl-edu@tudelft.nl
W www.biotechnologycourses.nl

Accommodation

Hotel accommodation can be arranged at your request, addressed to bsdl-edu@tudelft.nl

Lunches, the buffet on Monday, April 4th and the course dinner on Thursday, April 7th will be provided. For the other meals a variety of restaurants may be found in the centre of the city.

Program, 4 – 8 April 2016
Advanced Course on Biocatalysis and Protein Engineering

Monday, 4 April 2016

08.45	Registration
09.00	Outlook of the course *Isabel Arends*
09.15	Keynote lecture The future of Biocatalysis *Isabel Arends*
10.30	Enzyme-catalysed synthesis of C-C bonds: Hydroxynitrile lyase/Oxynitrilase *Ulf Hanefeld*
11.45	Immobilization of biocatalysts Roger Sheldon
14.45	From natural environment to biocatalyst *Gerard Muyzer*
16.00	Engineering nature's enzyme repertoire for food, pharma and biofuels *René de Jong*
17.00	Social drink and buffet

Tuesday, 5 April 2016

09.00	Themes of the day
09.15	Biocatalysis and sustainability *John Woodley*
10.45	Reactions of serine hydrolases Case study Hydrolysis - esterification - transesterification - aminolysis – perhydrolysis introduction - organic media - introduction enantioselection *Ulf Hanefeld*
14.45	Reactions with proteases *Timo Nuijens*
16.00	Principles of enantioselection: mathematics and applications Enantiomer discrimination - kinetic resolution - conversion and ee- dynamic kinetic resolution *Adrie Straathof*

17.00	Reaction engineering: optimizing the medium for enzymatic conversions Temperature - pressure - pH - solvent - thermodynamic approach - stability *Adrie Straathof*

Wednesday, 6 April 2016

09.00	Themes of the day
09.15	Protein engineering Protein engineering – enzyme stability – enzyme specificity – optimisation of biocatalytic characteristics *Dick Janssen*
10.30	Genomic databases, bioinformatics and biocatalysis Genome sequences - database searches - structure prediction – sequence analysis - screening *Dick Janssen*
11.30	Directed evolution of enzymes *Uwe Bornscheuer*
14.15	Biocatalysis – a tool for sustainable production of ester-based surfactants *Oliver Thum*
15.30	Workshop Enzyme visualization / bioinformatics (basic / advanced) *Linda Otten and other teachers*

Thursday, 7 April 2016

09.00	Themes of the day
09.15	From biotransformation towards industrial process Choice of reactor type - batch vs. continuous - diffusion limitations *Adrie Straathof*
11.30	Non-aqueous biocatalysis *Ulf Hanefeld*
13.45	Enzymes in food technology *Stuart West*
15.15	Development of efficient enzymes using the fungal C1-technology platform *Sandra Hinz*
18.00	Course dinner

Friday, 8 April 2016

09.00	Themes of the day
09.15	Fundamentals and application of BioRedoxCatalysis *Stephan Lütz*
11.15	Biocatalytic oxidation and oxyfunctionalization reactions *Frank Hollmann*
14.00	Selection and development of biocatalysts for the preparation of fine chemicals *Bernhard Hauer*
15.00	An industrial perspective *Andreas Taglieber*
16.00	Evaluation of the course and farewell drink *Ulf Hanefeld*

Fees and Registration

Please fill in the application form on our website www.biotechnologycourses.nl or complete and return the form below if you are interested to attend the course or would like to receive information on other courses. Applications will be handled in order of the date of receipt.

The course fee is:
€ 2500.- in case of payment received before **22 February 2016** or
€ 2750.- in case of payment received after this date.
In the event of cancellation before 22 February 2016, a full refund will be granted, after this date, a 25% fee charge will be made.
To facilitate enrolment of young PhD-students, a limited number of fellowships is available. The course fee with fellowship is € 1250.-. To apply, please include a copy of your enrolment as a PhD-student from your university.

The fee includes course materials, lunches, the buffet on Monday, April 4th and the course dinner on Thursday, April 7th. The fee does not cover other meals and lodging.

When the number of participants is too low to have a fruitful course, the Institute BSDL will cancel the event no later than five 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, BSDL will arrange an equivalent replacement.

Hotel accommodation can be arranged at your request.

Preparatory texts will be sent after receipt of the course fee. The complete course book will be supplied at the start of the course.

Advanced Course Biocatalysis & Protein Engineering

- I wish to attend the course of 4 – 8 April 2016
- I would like to receive information of the other courses of the **Institute BSDL**
- 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

Prof. I.W.C.E. Arends
Biocatalysis and Organic Chemistry
Delft University of Technology
Delft, the Netherlands

Prof. U. Hanefeld
Biocatalysis and Organic Chemistry
Delft University of Technology
Delft, the Netherlands

Faculty staff

Dr. F. Hollmann
Biocatalysis and Organic Chemistry
Delft University of Technology
Delft, the Netherlands

Dr. A.J.J. Straathof
Bioprocess Integration
Delft University of Technology
Delft, the Netherlands

Coordinators workshop

Dr. L.G. Otten
Delft University of Technology
Delft, the Netherlands

Dr. R. Medici
Delft University of Technology
Delft, the Netherlands

Guest lecturers

Prof. U.T. Bornscheuer
Greifswald University
Institute of Biochemistry
Greifswald, Germany

Prof. B. Hauer
University Stuttgart
Dept. of Biological Engineering
Stuttgart, Germany

Dr. S. Hinz
Dyadic Netherlands
Wageningen, the Netherlands

Prof. D.B. Janssen
University of Groningen
Dept. of Biochemistry
Groningen, the Netherlands

Dr. R. de Jong
DSM Biotechnology Center
Delft, the Netherlands

Dr. S. Lütz
Novartis Pharma AG
Basel, Switzerland

Prof. G. Muyzer
University of Amsterdam
Faculty of Science
Amsterdam, the Netherlands

Dr. T. Nuijens
Enzypep
Geleen, the Netherlands

Prof. R.A. Sheldon
CLEA Technologies B.V.
Delft, the Netherlands

Dr. A. Taglieber
Firmenich SA
Geneva, Switzerland

Dr. O. Thum
Evonik Industries AG
Essen, Germany

Dr. S. West
Biocatalysts Ltd.
Wales, United Kingdom

Prof. J. Woodley
Technical University Denmark
Lyngby, Denmark

Course coordination

Jenny Boks-Zondervan
Vincent Renken, MSc, MSc(Ed)
BSDL, Delft University of Technology
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2628 BC Delft
The Netherlands

The institute **Biotechnology Sciences Delft Leiden (BSDL-EDU)** 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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