Board of the Course
Dr. Jean-Marc Daran
Department of Biotechnology
Delft University of Technology
Delft, the Netherlands

Prof. Dick de Ridder
Bioinformatics group
Wageningen University
Wageningen, the Netherlands

Faculty staff
Dr. Pascale Daran-Lapujade
Dr. Stefan de Kok
Dr. Ton van Maris
Dr. Martijn Pinkse
Prof. Jack Pronk
Dr. Aljoscha Wahl

Coordinator Computer Exercises
Marcel van den Broek
Department of Biotechnology
Delft University of Technology
Delft, the Netherlands

Guest Lecturers
Dr. Anthony Burgard
Genomatica
San Diego, CA, USA

Dr. Derek Butler
BaseClear
Leiden, the Netherlands

Mark Chadwick, PhD
DSM
Delft, the Netherlands

Dr. Sylvie Dequin
INRA
Montpellier, France

Prof. Matthias Heinemann
Groningen University
Groningen, the Netherlands

Dr. Sacha van Hijum
Radboud Nijmegen Medical Center
and NIZO
Nijmegen, the Netherlands

Dr. Eric Johansen
Christian Hansen A/S
Hørsholm, Denmark

Dr. Hannes Link
Institute of Molecular Systems Biology
ETH Zürich
Zürich, Switzerland

Dr. Giani Liti
National Center for Scientific Research
(CNRS)
Nice, France

Dr. Hanna Schebesta
Law & Governance group
Wageningen University
Wageningen, the Netherlands

Prof. Hauke Smidt
Laboratory of Microbiology
Wageningen University
Wageningen, the Netherlands

Prof. Ralf Takors
Stuttgart University
Stuttgart, Germany

Prof. Bas Teusink
Vrije Universiteit Amsterdam
Amsterdam, the Netherlands

Dr. Ronald de Vries
Utrecht University and CBS Fungal
Biodiversity Centre,
Utrecht, the Netherlands

Prof. Ken Wolfe
University College
Dublin, Ireland

Course Coordination
Ms. Jenny Boks-Zondervan
Dr. Eline Huisjes
Biotechnology Studies Delft Leiden
Delft University of Technology
Department of Biotechnology
Delft, the Netherlands

Institute Biotechnology Studies Delft Leiden (BSDL)
Delft University of Technology, Department of Biotechnology
Julianalaan 67
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
- BIOCATALYSIS AND PROTEIN ENGINEERING
- BIOPROCESS DESIGN
- DOWNSTREAM PROCESSING
- ENVIRONMENTAL BIOTECHNOLOGY
- GENOMICS IN INDUSTRIAL BIOTECHNOLOGY
- METABOLOMICS FOR MICROBIAL SYSTEMS BIOLOGY

Further information
Ms. Jenny Boks-Zondervan
Dr. Eline Huisjes
Course coordination
P +31 15 278 1922 / 8311
F +31 15 278 2355
bsdl-edu@tudelft.nl
www.bsdl-edu.bt.tudelft.nl

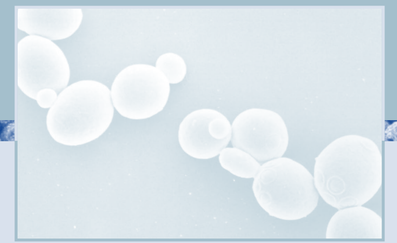
Address
Institute Biotechnology Studies Delft Leiden
Department of Biotechnology, Delft University of Technology
Julianalaan 67, 2628 BC Delft, the Netherlands

Design: Leiden in vorm!, Leiden, e gerard@leideninvorm.nl, i www.leideninvorm.nl

Advanced Course

GENOMICS IN INDUSTRIAL BIOTECHNOLOGY

27 - 31 October 2014



TU Delft
Delft University of Technology

Universiteit Leiden

BSDL

Aim

The Advanced Course on Genomics in Industrial Biotechnology aims at familiarizing industrial and academic research professionals (i.e. MSc, PhD, or equivalent experience) with modern concepts in genomics, their use in microbial research and development, and their utility in contemporary biotechnological industry.

This course focuses on the singular and combined utilization of the modern molecular research tools genome sequencing, trans-criptomics, proteomics, and metabolomics to elucidate cellular regulatory mechanisms of sensing and signalling, metabolic flux and physiology. Mathematical tools and computer algorithms are indispensable to analyze, interpret and model this experimental data. In combined approaches, these tools offer unprecedented possibilities for industrial biotechnology research.

Experts will present lectures on genome analysis and -interpretation, genome-wide mRNA expression analysis (transcriptomics), whole-organism protein expression and activity analysis (proteomics), and metabolic pathway analysis (metabolomics). Data handling and bioinformatics are key to the successful application of genomics and hence, will be an integral part of the course. The necessary links between theory and practice will be provided in interactive case studies and demo-workshops. Implementation of these technologies in industrial R&D will be illustrated with real-life examples.

Course description

This intensive, high-diversity, one-week course provides a full overview of the possibilities and challenges of genomics in the field of industrial biotechnology. A combination of expert lectures and hands-on activities ensures active participation. The participants will receive the course book, including the presentations of the lecturers, on the first day. The course will be taught in English.

Lectures
Expert lectures are taught by renowned scientists from both Delft University of Technology as well as other universities and companies from all over the world. They will focus on a variety of themes:

- Genome sequencing and analysis
- Transcriptomics (incl. RNA sequencing)
- Proteomics
- Metabolomics
- Bioinformatics
- Systems Biology
- Genomics in strain improvement (incl. metabolic and evolutionary engineering)
- Regulation, legislation and patents
- Biodiversity
- Novel molecular tools and automated strain construction
- Examples from biotechnology industry

Hands-on
Two afternoons are reserved for hands-on activities in bioinformatics. These will focus on analysis of next-generation sequence data, massive data handling, statistics, interpretation and visualisation of genomics data.

Who should attend ?

This Advanced Course is aimed both at participants from industry, who want to update and extend their theoretical knowledge and practical insight in this field and at participants from universities and research institutions with a wish to evaluate practical implications of their research.

It is intended for postgraduates (MSc, PhD level, or equivalent experience), with a sound background in microbiology, microbial physiology, molecular cell biology, biochemistry or biochemical engineering, and a basic working knowledge in some of the other disciplines. Having some basic insight into one or more of the genomics technologies or in bioinformatics is not compulsory, but certainly is an advantage.

Duration & Location

This Advanced Course will be given on
Monday, October 27 - Friday, October 31, 2014
The course will be held at
Hampshire Hotel Delft Centre
Koepoortplaats 3
2612 RR Delft
the Netherlands
P +31 (0)15 212 2125
W www.hoteldelftcentre.nl

Please note: registration is handled by BSDL!

Accommodation

The course fee includes meals (5 lunches and 4 dinners). Hotel accommodation is not included. A hotel room at Hampshire Hotel Delft Centre can be reserved for you for € 105 per person per night. Please indicate this during the registration procedure.

Program, 27 October - 31 October 2014

Monday, October 27, 2014
Theme: Genome Sequencing & Analysis
08.45 **Registration**
09.00 **Introduction**
Jean-Marc Daran
09.30 **Technology Review I: Microbial genome sequencing**
Derek Butler
10.45 **From raw data to assembled genome**
Dick de Ridder
12.00 **Genome annotation**
Ken Wolfe
14.00 **Interactive case**
Analysis of next-generation sequencing data
Marcel van den Broek / Dick de Ridder
16.30 **Continuation of the case**
18.00 **Dinner**
19.30 **Genomics of wine yeasts**
Sylvie Dequin

Tuesday, October 28, 2014
Theme: Analytical Tools
09.00 **Technology Review II: Transcriptomics**
Jean-Marc Daran
10.15 **Technology Review III: Proteomics**
Martijn Pinkse
11.30 **Technology Review IV : Metabolomics**
Aljoscha Wahl
13.30 **Introductory Lecture**
Bioinformatics, data handling & visualization
Dick de Ridder
14.45 **Computer demo's**
Bioinformatics: massive data handling, statistics, interpretation and visualization
Marcel van den Broek / Dick de Ridder
16:00 **Continuation of the computer demo's**
18.00 **Dinner**
19.30 **Genomics of filamentous fungi**
Ronald de Vries

Wednesday, October 29, 2014
Theme: Systems Biology
09.00 **Introduction to genome-scale metabolic models**
Bas Teusink
10.15 **Metabolic Flux Analysis**
Aljoscha Wahl
11.30 **Metagenomics of the intestinal microbiome**
Hauke Smidt
13.30 **Linking the –omes**
Pascale Daran-Lapujade
14.45 **Post-translational modifications**
Hannes Link
16.00 **Application of systems biology in the biotech industry**
Ralf Takors
18.00 **Dinner**
19.30 **Model-based design of metabolic networks**
Anthony Burgard

Thursday, October 30, 2014
Theme: Genomics & Strain Improvement
09.00 **Introduction to Metabolic Engineering**
Ton van Maris
10.15 **Exploring biodiversity: QTL analysis**
Gianni Liti
11.30 **Evolutionary engineering and inverse metabolic engineering**
Jack Pronk
13.30 **Strain improvement and regulatory constraints: experiences from the food industry**
Eric Johansen
15.15 **(Intellectual) Property Rights**
Hanna Schebesta
16.30 **Patenting genes and genomes**
Mark Chadwick
19.00 **Course dinner**

Friday, October 31, 2014
Theme: Outlook
09.00 **Novel molecular tools in strain construction**
Jean-Marc Daran
10.15 **Automated strain construction**
Stefan de Kok
11.30 **Metagenomics of mixed-culture processes**
Sacha van Hijum
13.30 **Heterogeneity in pure cultures**
Matthias Heinemann
14.45 **Evaluation**
Jean-Marc Daran
15.00 **Drinks**

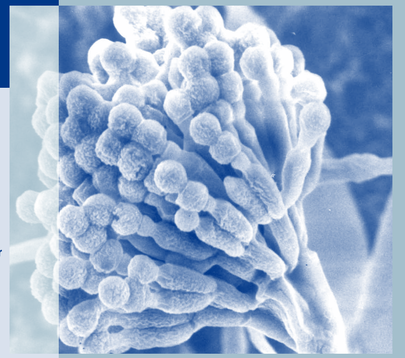
Fees & Registration

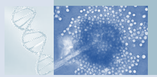
This course does not have a selection procedure. Please visit our website, or complete and return the attached form if you are interested to attend the course or would like to receive information on following or other courses. Registration is on a "first come, first serve" basis.

The course fee is:
Early bird fee: € 2750.- if payment is received before **15 September 2014.**
Regular fee: € 3000.- if payment is received after **15 September 2014.**

To facilitate enrolment of PhD students, a limited number of fellowships is available, covering half of the course fee (i.e. the reduced fee is € 1375.-). To apply for this fellowship, please include proof of your university registration as a PhD student.
The fee includes course materials, meals (5 lunches and 4 dinners). The fee does not include hotel accommodation. The course location is Hampshire Hotel Delft Centre (located very close to the city centre of Delft). We can reserve a room in this hotel for € 105.- per person per night.
In the event of cancellation before 15 September 2014 a full refund will be granted. After this date, a 25% fee charge will be made.

The complete course book will be supplied at the start of the course.





Advanced Course **Genomics in Industrial Biotechnology**

☐ I wish to attend the course of 27 - 31 October, 2014
☐ I would like to receive information of the other courses of the **Institute BSDL**
☐ Please send me announcements of the future **Advanced Course Genomics in Industrial Biotechnology**

Family name, title, Mr / Ms _____ First name _____
Organisation / Company _____
Address _____
_____
Phone _____
E-mail address _____
Educational background _____
Diet wishes _____
Date / Signature _____