

International Masterclass: Protein Engineering of Cytochrome P450s

EU-RTN Network P4FIFTY

September 30 - October 4, 2013

University of Groningen, The Netherlands

Coordination and Teachers

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Germany

Goal and outline

The course aims to make students familiar with the use of computational and bioinformatics tools for engineering the biocatalytic performance of cytochrome P450 enzymes. The course provides both a sound theoretical background on the biochemistry of P450s and hands-on experience with computational methods. The theoretical and practical parts are integrated in a few problem-solving modules.

The rationale for this focus is the growing awareness that protein engineering methods, including directed evolution, can benefit a lot from the use of computational methods. Through the use of computational tools, it becomes possible to make large jumps in function and to improve enzymes that are not readily screened by high-throughput methods. The use of structural information and computational tools thus accelerate the tailoring enzyme properties for a specific industrial process.

The course is organized as part of the training activities of the FP7-funded European Marie Curie Training network P4FIFTY. This network of academic and industrial researchers explores the development of enzymatic methods for green oxidation chemistry through the isolation, redesign and application of cytochrome P450 enzymes.

Topics covered by the lectures and computer classes include:

- Discovery and general properties and of P450s that can be used in biocatalysis
- Diversity and details of electron-transfer mechanisms
- Catalytic mechanisms of P450s
- High-throughput mutagenesis, purification, and assays
- Thermostability, principles, measurement, high-throughput analysis of stability
- Biochemical enzyme characterization
- Molecular modelling and visualisation of protein structures
- Docking simulations and mutant design
- Industrial aspects of P450s and other hydroxylation biocatalysts.

Masters, confirmed speakers

Neil Bruce, Univ. of York, United Kingdom

Marco Fraaije, Univ. Groningen, The Netherlands

Gideon Grogan, Univ. of York, United Kingdom

Dick Janssen, Univ. Groningen, The Netherlands

Henk-Jan Joosten, Bio-Product, The Netherlands

Jürgen Pleiss, Univ. of Stuttgart, Germany

Gerard Roelfes, Univ. Groningen, The Netherlands

Vlada Urlacher, Univ. Düsseldorf, Germany

Daniele Werck, CNRS, France

Hein Wijma, Univ. Groningen, The Netherlands

John Woodley, DTI, Denmark

Expected participants

A good knowledge of basic biochemistry, enzymology, and molecular biology is required. Some experience with the visualisation of proteins (e.g. Pymol) is also needed.

- PhD students (ESRs) and post docs (ERs) from the P4FIFTY RTN network and the participating beneficiaries.
- PhD students from the Metaexplore, Oxygreen, Bionexgen and Kyrobio EU projects.
- PhD students from GBB, University of Groningen, and from the BE-Basic consortium.
- Researchers from industry.

Location and Facilities

Lectures: Bernoulliborg, University of Groningen. PC and beamer.

Computer practicals: Nijenborgh 4, University of Groningen (same campus). PCs, room with PC and beamer.

Breaks: coffee, tea, refreshments.

Lunches & 3 dinners will be provided.

Costs

For attendance and catering during the meeting, abstract book and 3 dinners. Hotel not included.

- RTN-P4FIFTY GBB-RUG participants: € 200,=
- Other EU junior academic participants (PhD students, post docs): € 300,=
- Non-EU and industrial participants: € 450,=

Registration

[Registration is open.](#)

Website

Course information and details are also available through the [website](#)

Hotel information

The Hampshire Hotel Groningen Centre Groningen offers a special rate for participants: 84,50 to 114,50 euro incl. breakfast (there is a limited number of rooms!).

Reservations for these rooms should be made after you have received notification of acceptance by completing and submitting the reservation form.

Hampshire Hotel - Plaza Groningen
Radesingel 50
9728 JT Groningen
The Netherlands

Other suggested hotels are:

[University Hotel](#)

[Martini Hotel Groningen](#)

[Eden City Hotel](#)

[Asgard Hotel](#)