

PNS0151 Genome editing by CRISPR/Cas9 in theory and practice, 5.0 Credits

Syllabus approved

2017-08-28

Subjects

Biology

Grading scale

Pass / Failed. The requirements for attaining different grades are described in the course assessment criteria which are contained in a supplement to the course syllabus. Current information on assessment criteria shall be made available at the start of the course.

Language

English

Prior knowledge

The practical part of the course is primarily intended for PhD students within the SLU Graduate School Organism Biology, but will be open to all interested PhD students and researchers who want to learn how to edit genomes of plants/fungi using the most recent and advanced CRISPR/Cas9 system. No previous experience in genome editing is required but experience in molecular biology is essential. All lectures will be carried out as open events, no registration is required to attend the theoretical part of the course.

Objectives

After this course you should be able to design and implement CRISPR to manipulate your gene(s) of interest in, and validate the outcome of the procedure at the molecular level.

Content

The course provides the participants with a strong theoretical background in genome editing in form of lectures, seminars and open discussion. Furthermore, different applications of genome editing will be covered. This course will provide hands-on training in genome editing and cell engineering in plant and fungal species using genome editing with special emphasis on CRISPR/Cas9. Participants will learn to design CRISPR strategies using bioinformatics, generate gene knockouts/knock-ins, and validate targets using the most state of the art technologies. During the practical part students will design and attend an experiment within a given framework, analyse the results and present the

data in a form, which would be required for a publication. The course consists of roughly equal theoretical and practical parts and will run on part time over a 4 week period.

Formats and requirements for examination

Students are expected to attend theoretical parts, take active part in discussions and attend the practical part of the course. The practical part includes the design of an experiment within a given framework, execution of the experiment and analysis of the data. The data should be presented as a written report in form of a materials and methods chapter plus a figure, prepared as it would be for a publication. At the end of the course, students will give a short presentation on how their research could benefit from the use of genome engineering.

Additional information

The course is organized by Panagiotis (Panos) Moschou on behalf of the SLU graduate school Organism Biology. Two invited speakers, Florian Veillet (INRAE, France) and Thomas Jacobs (VIB, Belgium) will provide insights into CRISPR applications in disease resistance and technological advancements of CRISPR. The course will be online via Zoom. Maximum 20 students per course occasion.

Responsible department

Department of Plant Biology