Hanze

Course: Laboratory Course Theme 9 credits: 6

Course code	BOVH20RTHM9
Name	Laboratory Course Theme 9
Study year	2023-2024
ECTS credits	6
Language	English
Coordinator	P.M. Dammers
Modes of delivery	Practical / Training
Assessments	- Other assessment

Learning outcomes

Learning outcomes:

- The ability to perform important molecular genetic techniques such as restriction analysis, DNA cloning (ligation and transformation of E. coli cells), and PCR.
- Successfully demonstrate an understanding of CRISPR-Cas9 technology and the ability to apply CRISPR interference techniques in a laboratory setting to modify specific genes and analyse the effects on the target organism.
- Analyse the research data of the experiment in a statistically responsible manner and discuss the data based on literature and draw a conclusion.
- Create an English report about the performed experiment according to established guidelines.

Content

Course content:
In this practical, emphasis will be placed on some general molecular genetic techniques, such as restriction analysis, DNA cloning (ligation and transformation of *E. coli* cells), and PCR.
The CRISPR-Cas9 technique, specifically CRISPR interference, will be used as a tool for genetic modification of *Bacillus subtilus*. CRISPR interference (CRISPRi) is a method used to downregulate specific genes in an organism. In the case of *Bacillus subtilis*, the AmyE and SunI genes can be targeted using CRISPRi to reduce their expression levels. This technology leverages the CRISPR-Cas9 system to bind to the promoter region of target genes and prevent transcription, leading to decreased gene expression. By downregulating the AmyE and SunI genes in *Bacillus subtilis*, you will be able to study the function of these genes and potential applications in biotechnology. You will complete this project by writing a report in English where the research results will be presented and discussed in an organized manner and according to established guidelines.

Included in programme(s)

Major Biology and Medical Research

School(s)

Institute for Life Science & Technology

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