BIO-318

Scientific project design in synthetic biology (iGEM)

Deplancke Bart, Grisoni-Neupert Barbara, Maerkl Sebastian

Cursus	Sem.	Type
Bioengineering	MA1, MA3	Opt.
Sciences du vivant	MA1, MA3	Opt.

Language of teaching	English
Credits	5
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	150h
Weeks	14
Hours	**5 weekly**
Courses	2 weekly
Exercises	3 weekly
Number of positions	**0**

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

Remark

Only a limited number of students will be selected (max. 12) based on their application file. Selection of team participants is highly competitive (February 2017). Participants of iGEM team 2017 will register on IS-Academia in BA6/MA3.

Summary

An interdisciplinary EPFL student team will design and build genetic circuits with novel functionalities. Students learn to develop a project and carry it out to completion in a concrete manner. Their creativity and critical thinking are highly encouraged.

Content

The first part of the course consists of a broad introduction to genetic engineering, synthetic biology, computational biology, and related fields. During this time, students will brainstorm potential projects, from which one will be selected. The team will then model and ultimately build the proposed genetically engineered machine in the wet-lab portion of the project during the summer. Due to the interdisciplinary nature of the course, students with a wide variety of backgrounds will constitute the team and therefore facilitate information and knowledge exchange amongst team members.
A purely bioinformatic iGEM track is also available, generating the possibility to have a second, smaller team work solely on computational and bioinformatic aspects of genetic engineering either as a stand-alone team or in conjunction with the applied project.

Important remark: Only a limited number of spots will be available each year and we expect a highly competitive process for selecting team participants.

Learning Outcomes

By the end of the course, the student must be able to:

- Discuss the definition of synthetic biology and how this discipline enables the engineering of biological systems
- Develop a project/idea and generate a roadmap on how to execute this project
- Conduct independent experiments in a research lab
- Organize themselves to finish a research project
- Present and defend a research project in front of a panel of international judges
- Operate in a multidisciplinary group having acquired both leadership and team spirit-oriented skills
- Assess / Evaluate the progress and outcome of a research project and to contribute to this project in creative fashion

- Discuss the societal implications of synthetic biology, clarifying its pros and cons

Assessment methods

Written report and oral presentation.