

BIO-450

Molecular endocrinology: health and environment

Brisken Cathrin

Cursus	Sem.	Type
Life Sciences Engineering	MA1, MA3	Opt.
Minor in life sciences engineering	H	Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	4 weekly
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

We will define homeostasis, principles of hormone action and the molecular mechanisms underlying them to illustrate the complexities of physiological regulation. Human interactions with the environment, pertinent public health issues and their causes and preventative strategies will be analyzed.

Content

Study human physiology and the cellular and molecular basis underlying endocrine control mechanisms. After a basic primer in general endocrinology and physiology, we examine the various mechanisms of steroid and peptide hormone action, as well as the cross talk between the pathways and their role in cellular signaling. We will discuss the role of hormones in development. Then, focus on how these pathways are involved in human diseases such as diabetes, obesity and endocrine-related cancer and discuss mechanisms of endocrine disruption and transgenerational disease predisposition.

Keywords

endocrine system, endocrine disruptors, genetic and environmental factors in human disease, nuclear hormone receptors, physiology, reproduction, sex differentiation, homeostasis, diabetes, obesity, hormone dependent cancers, climate change

Learning Outcomes

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

- Assess / Evaluate
- Contextualise
- Interpret
- Propose
- Plan
- Explore
- Investigate
- Explain

Transversal skills

- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Communicate effectively, being understood, including across different languages and cultures.

- Take responsibility for environmental impacts of her/ his actions and decisions.
- Take account of the social and human dimensions of the engineering profession.
- Demonstrate a capacity for creativity.
- Demonstrate the capacity for critical thinking
- Access and evaluate appropriate sources of information.

Teaching methods

Ex-cathedra lectures, practical session, group projects

Expected student activities

Group projects: movie for lay public, analysis and discussion of a public health problem, causes and solutions

Assessment methods

Continuous exams

Written exam(s)

group projects

Resources

Bibliography

suggested reading and websites

Moodle Link

- <https://go.epfl.ch/BIO-450>