CH-411

Cellular signalling

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Cursus	Sem.	Type
Chimiste	MA1, MA3	Opt.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	Written
Workload	60h
Weeks	14
Hours	**2 weekly**
Courses	2 weekly
Number of positions	

Summary

Presentation of selected signalling pathways with emphasis on both the mechanism of action of the molecules involved, molecular interactions and the role of their spatio-temporal organization within the cell, considering cellular dimensions and conditions.

Content

Ligand binding and receptor activation.Receptor systems in plasma membrane, cytosol and nucleus. Lipids, proteins and molecular interactions. Regulation of activity and covalent modification. Spatial and temporal organisation of molecules and signalling efficacy.

Keywords

Cellular signalling, molecular interactions, space and time, cellular conditions, receptor, ligand, membranes, protein modifications

Learning Prerequisites

Required courses

Biochimie I (CH-210)
Macromolecular structure and interactions (CH-311)
Dynamics of biomolecular processes (CH-312)
Chemical Biology (CH-313)

Recommended courses

Biochemistry II (CH 313)
Reaction kinetics

Important concepts to start the course

Biochemistry, cell and organells, membranes, proteins, biophysical methods. physical chemistry

Learning Outcomes

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

- Integrate molecular and cellular events
- Discuss cellular signalling pathways
- Analyze scientific literature
- Assess / Evaluate mechanisms of regulation

- Contextualise receptor-ligand interactions
- Elaborate Spatio-temporal organisation and regulation
- Estimate using logical deduction and common senese

Teaching methods

Lectures & discussion

Expected student activities

Active participation to lectures; read and interpret scientific reviews and papers

Assessment methods

Oral exam, without preparation

Supervision

Others during course or on rendez-vous

Resources

Bibliography

course hand-outs
review and research articles

Notes/Handbook

standard text books

Websites

- http://Moodle

Moodle Link

- https://go.epfl.ch/CH-411