

Faculty of Medicine

**BICL3285 Regulation of enzyme activity**

[22.5h]

Teacher(s): Paulus Michels (coord.), Mark Rider
Language: French
Level: Third cycle

Aims

This is an advanced optional course on the control of enzyme activity by non-covalent mechanisms and by reversible phosphorylation and is given over 2 years (although each year counts as a separate course). The course is suited to students wishing to embark on a career in research, for example masters degree students or students undertaking a PhD.

Main themes

The following topics will be covered in depth:

Quantitative analysis of metabolic control(MCA), allosteric control of enzyme activity, control of enzyme activity and metabolic fluxes by protein-protein interactions, formation of multi-enzyme complexes and metabolic channeling, novel methodology for measuring these phenomena.

Historical discovery of protein phosphorylation, control of glycogen metabolism by phosphorylation, molecular structure of protein kinases, evolution of protein kinases, methodology - phosphorylation site determination, generation and use of phospho-specific antibodies, transfection experiments with dominant negative protein kinase constructs, knock-out models. Receptor and non-receptor protein tyrosine kinases, phosphoprotein phosphatases (phospho-serine/threonine and phospho-tyrosine).

Content and teaching methods

This is an advanced course given over 2 years but counted as 2 separate courses. The first part deals with non-covalent mechanisms of control of enzyme activity while the second part deals with control by phosphorylation-dephosphorylation..

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Course requirements - good knowledge of chemistry, physics and biochemistry.

Evaluation - based on student seminar presentations.

Course language: english

Support - all lectures will be given as PowerPoint presentations which will be made available to the students.