SCIENTIFIC AND METHOD MODULES

Module name	Basic Concepts in Biochemistry
Number	2013-B2
Aims	Doctoral researchers without a background in biochemistry or biology will be brought up to a level necessary to understand the thematic and advanced modules (T1–T6, A2, A1). The module introduces basics in bioactive molecules and biomacromolecules, including their structure and (bio)chemical properties, as well as cell biology. The doctoral researchers will learn how proteins are produced, how mutations are introduced and which types of chemical and physical data can be obtained from these types of experiments.
Basics	
Contents	Basic bioactive molecules and macromolecules (DNA, RNA, peptides, proteins, carbohydrates, lipids), Cell structure and metabolism, Methods in molecular biology (recombinant DNA, PCR, tools to produce DNA or proteins), Proteins (biochemical and biophysical characteristics, folding and stability), Cell membranes, Protein chemistry, Tissue culturing and biological assays, fluorescence microscopy.
Methods	
Type	Two-day block course/ yearly recurrence with modification
Date (month/year)	25/26 March 2013
Time	page 2
Work load	15 hours presence/ 45 hours self-study
Examination	Oral/written
Credit points	2
Responsible scientists	Harms, Huster
International guest lecturers	-
Industrial partners	-
Recommendations for literature, e-learning	• L. Stryer: Biochemistry • G. Löffler: Basiswissen Biochemie

Graduate School BuildMoNa
Universität Leipzig
Johannisallee 29
04103 Leipzig
Germany

Phone: +49 341 97-36016
Fax: +49 341 97-36094

buildmona@uni-leipzig.de
www.buildmona.de

SCHEDULE for Module 2013-B2

Time	Lecturer	Programme	Location
25 March 2013			
9.00–9.45	Daniel Huster	Motivation: Why should physicists/chemists know about biochemistry?	Leipziger Kubus Hall 1 CD
10.00–11.30	Hauke Harms	Biomolecules. An overview Biopolymers and their building blocks Polysaccharides (cellulose, chitin, murein) Proteins Nucleic acids Lipids Inorganic structures Functional vs. structural proteins Enzyme classes, transporters Self assembly structures Molecular assembly lines Proteins involved in movement Vesicles	Leipziger Kubus Hall 1 CD
12.30–14.00	Antonis Chatzinotas	Basic principles in molecular biology Cellular information flow Gene regulation Genetic engineering and diagnosis Cloning, sequencing fingerprinting Systems biology	Leipziger Kubus Hall 1 CD
14.30–16.00	Peter Schmidt	Expression of proteins by microorganisms • Comparison of expression hosts • E. coli expression and fermentation • Short practical demonstration of Fermentation	Leipziger Kubus Hall 1 CD
	Hauke Harms	Short summary and questions	
26 March 2013			
9–10:30	Sandra Berndt	• Purification of Proteins by Chromatography • FPLC, Äkta System • Tags	Härtelstr. 16-18 Raum 110
11–12:30	Georg Künze	• Re-Folding of proteins • Activity tests • Radioactivity assays • Fluorescence assays of protein function	Härtelstr. 16-18 Raum 110
13:30–15:00	Falk Harnisch	Bioelectrochemical systems - processes involving the exchange of electrons between bacteria and electrodes	Härtelstr. 16-18 Raum 110
15:30–17	Members AG Huster IMPB	Short demonstration: Cloning, Expression, Purification, Activity Assays Proteins	Laboratories IMPB
	Daniel Huster	Short summary and questions	

Didactic elements:
Lecture, discussions, practical training – lab demonstration, etc.

Expected performance:
Active participation in discussions during lab demonstration etc.

Doctoral candidates from the biochemistry field are allowed to take part in the module but will not receive any credit point or mark for attendance.

Doctoral candidates who have already received two credit points and a mark for the attendance of this module can participate, but cannot receive two graded credit points again or improve their mark.