

[C3.2]	Advanced methods in biochemistry and biophysics	Compulsory elective module in the core area C3	5 CP (total) = 150 h				4 SWS	
			Contact hours 4 SWS / 60 h		Independent study 90 h			
Content								
<p>The practical course consists of 2 different experimental parts, which are carried out all day in groups of usually two students.</p> <ol style="list-style-type: none"> Reconstitution of a membrane protein: Using a typical membrane protein, all protein biochemical work steps that are necessary to prepare samples for further functional or structural biological studies are to be carried out. This involves cell disruption, membrane isolation, solubilization, purification, and incorporation of the membrane protein into liposomes. The obtained results are summarized and discussed in form of a scientific publication. Electrophysiology: The students investigate and analyze the electrical properties of cells and of proteins expressed in the membrane (light-inducible cation channel channelrhodopsin-2). Two-Electrode Voltage Clamp (TEVC) experiments are performed on <i>Xenopus laevis</i> oocytes and measurements are performed on the nematode <i>C. elegans</i> using the automatic Nemamatrix-Screenchip system. 								
Learning outcomes and skills								
<p>After completing the module, students can:</p> <ul style="list-style-type: none"> plan and perform basic biochemical experiments with membrane proteins discuss and interpret biochemical data write a manuscript conduct and interpret basic electrophysiological experiments accurately record and evaluate relevant data correctly present and interpret the results obtained 								
Admissions requirements/Conditions for participation in the module/courses								
Recommended prior knowledge								
Lecture of the <i>Advanced Methods in Biochemistry</i> module C2.1.								
Organizational details								
<p>The part 'Reconstitution of a membrane protein' takes place in the winter semester.</p> <p>The part 'Electrophysiology' takes place during the lecture-free period after the winter semester as a block practical course.</p>								
Module allocation (degree programme/faculty)			Master Biochemistry / FB14					
Module transferrable to other degree programmes								
Module offered			winter semester					
Duration			1 semester					
Module coordinator			Dr Liewald					
Course requirements for credits								
Participation record			regular attendance					
Coursework			Fulfillment and protocols of the practical course experiments					
Forms of teaching / learning								
Language teaching and instruction			English					
Module assessment			Form / duration / content, if applicable					
Final module assessment			Protocols (ungraded, see §35)					
Cumulative module assessment consisting of								
Composition of the module grade for cumulative module assessment								
			Mode of teaching / study	Semester hours per week	Semester CP			
					1	2	3	4
	Advanced methods in biochemistry and biophysics		P					
	1.	Reconstitution of a membrane protein		2	3			
	2.	Electrophysiology		2	2			
	TOTAL			4	5			