

**Modulbezeichnung:** Orientierungsmodul Structural Biology II: Structure and function relationships in biological macromolecules (OMA-StrBio2) 7.5 ECTS  
(Orientierungsmodul Strukturbioogie II: Struktur-Funktionsbeziehungen in Biologischen Makromolekülen)

Modulverantwortliche/r: Yves Muller

Lehrende: Rainer Böckmann, Benedikt Schmid, Yves Muller

Startsemester: SS 2022

Dauer: 1 Semester

Turnus: jährlich (SS)

Präsenzzeit: 120 Std.

Eigenstudium: 105 Std.

Sprache: Englisch

### Lehrveranstaltungen:

Orientierungsmodul Strukturbioogie II: Structure und function relationships in biotechnologically relevant macromolecules (SS 2022, Übung, 8 SWS, Yves Muller et al.)

### Empfohlene Voraussetzungen:

none

### Inhalt:

**Seminar** talks cover theoretical and methodological approaches for the study of structure-function relationships in proteins with a focus on the structural determinants that are responsible for the regulation of protein function.

**Laboratory course** focuses on advanced methods to study structure-dynamics-function relationships in proteins. Both experimental (heterologous protein production in eukaryotic cells, X-ray analysis, mutation studies) as well as theoretical methods (atomistic and coarse-grained molecular dynamics simulations) will be addressed. Additionally, students are introduced to X-ray crystallography and investigating protein stability via CD spectroscopy in hands-on lab-training units. The focus of the practical course will be the active participation in ongoing research projects in the participating labs.

### Lernziele und Kompetenzen:

The students are

- acquainted with novel insights, concepts, and methods in the study of protein-dynamics-function relationships
- understand state-of-the-art methods in the analysis of protein structure, dynamics, function and their limitations
- are able to independently develop working hypotheses, to independently design and conduct experiments
- able to present and critically discuss current research articles / their results and defend their conclusions in proper context

### Literatur:

introductory articles will be provided electronically

### Verwendbarkeit des Moduls / Einpassung in den Musterstudienplan:

Das Modul ist im Kontext der folgenden Studienfächer/Vertiefungsrichtungen verwendbar:

#### [1] Integrated Life Sciences: Biology, Biomathematics, Biophysics (Master of Science)

(Po-Vers. 2019w | NatFak | Integrated Life Sciences: Biology, Biomathematics, Biophysics (Master of Science) | Module Groups | MG3: Biological Structures and Processes | Mandatory Elective Modules Group 3 | Structural Biology II: Structure and Function Relationships in Biotechnologically Relevant Macromolecules)

### Studien-/Prüfungsleistungen:

Portfolio exam Structural Biology II: Structure and Function Relationships in Biotechnologically Relevant Macromolecules (Prüfungsnummer: 22111)

Prüfungsleistung, mehrteilige Prüfung

Anteil an der Berechnung der Modulnote: 100%

weitere Erläuterungen:

PL: written examination 90 min. PL: protocol of 15-20 pages PL: seminar talk 15 min.

Erstablingung: SS 2022, 1. Wdh.: keine Angabe

1. Prüfer: Böckmann/Muller (N40002)

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