

RUHR-UNIVERSITÄT BOCHUM

Biomolecular Chemistry

Focal Point in Master Programme Biochemistry

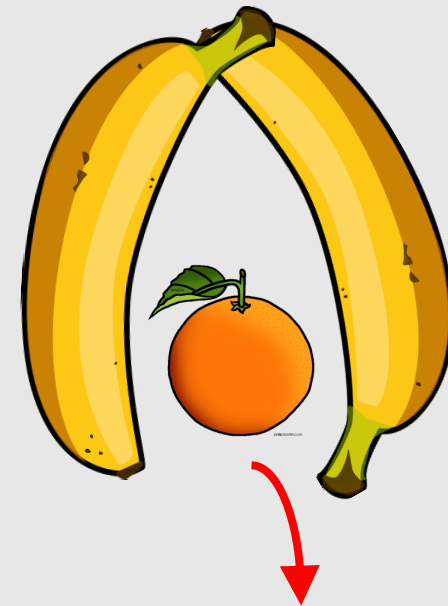
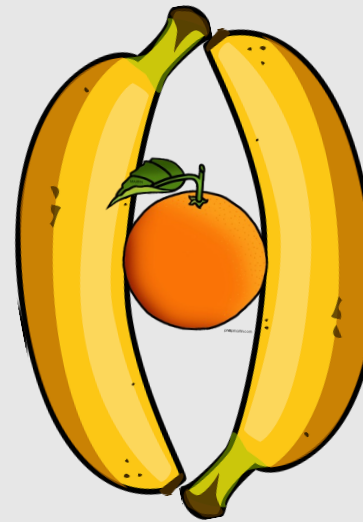
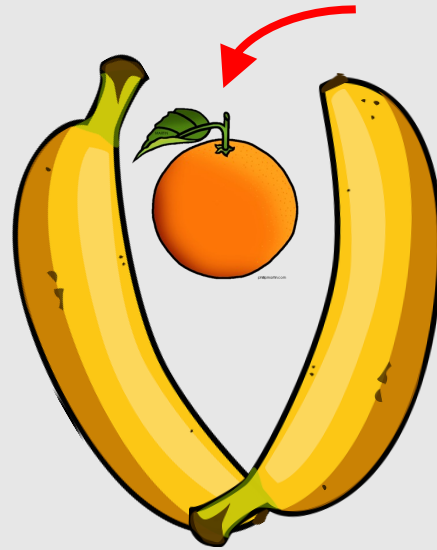
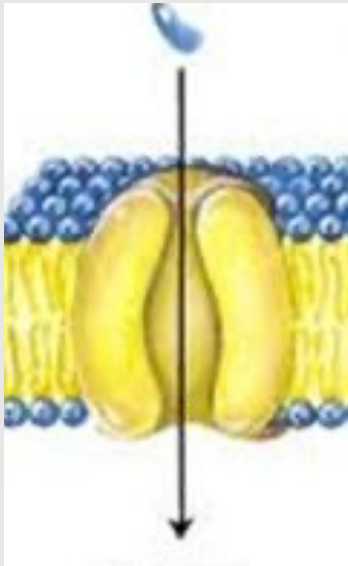
Speaker: Prof. Lars Schäfer

www.rub.de/bc-schwerpunkte/biomol.htm

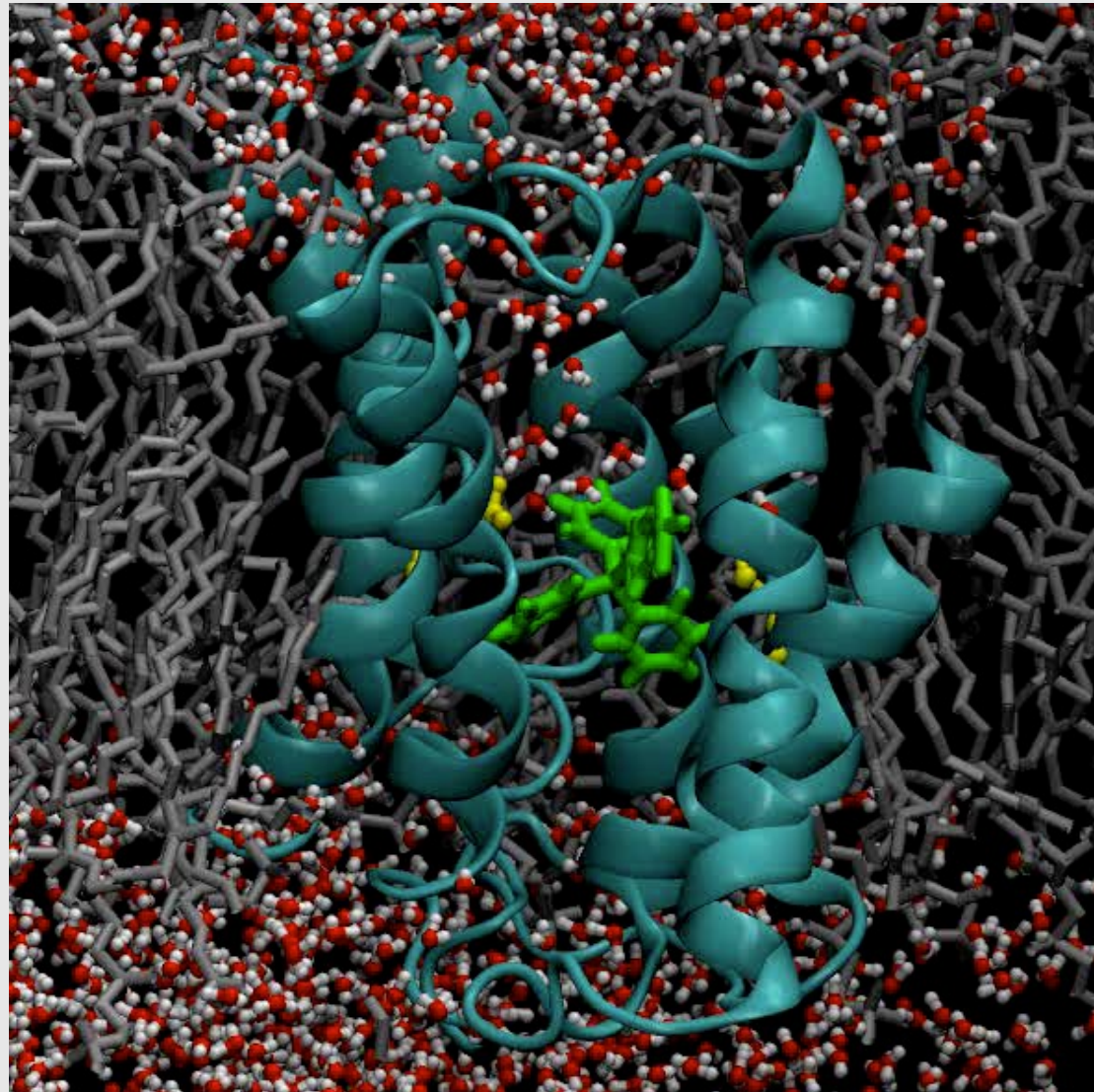
Introduction: November 14, 2023

Aim of Focal Point Biomolecular Chemistry

Biomolecules in Action: The Molecular View



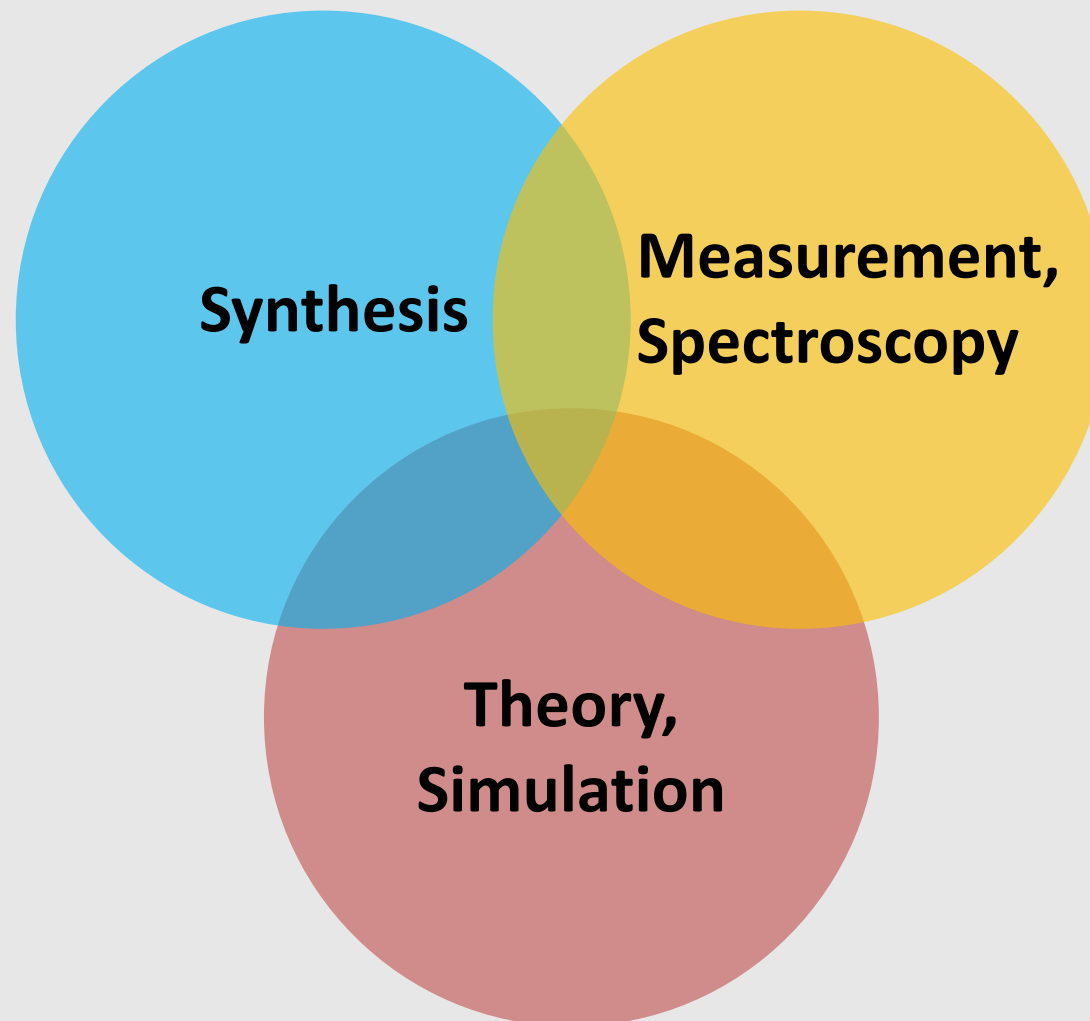
Biomolecules in Action: The Molecular View



Team at the Faculty of Chemistry and Biochemistry

www.rub.de/bc-schwerpunkte/biomol.htm

The focal point is structured into 3 major topics:



Team at the Faculty of Chemistry and Biochemistry

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The focal point is structured into 3 major topics:

- Synthesis
 - Measurement & spectroscopy
 - Theory & simulation
- } connected

Synthesis:

- Johannes Karges, medicinal inorganic chemistry
- Nils Metzler-Nolte, bioinorganic chemistry
- Stefan Huber, organic chemistry

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The focal point is structured into 3 major topics:

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Measurement & spectroscopy:

- Simon Ebbinghaus, biophysical chemistry
- Martina Havenith-Newen, physical chemistry
- Christian Herrmann, protein interactions
- Sebastian Kruss, functional materials and biosystems
- Poul Petersen, physical chemistry
- Axel Rosenhahn, biointerfaces
- Wolfgang Schuhmann, electrochemistry

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Theory & Simulation:

- Lars Schäfer, biomolecular simulations
- Dominik Marx, ab initio simulations

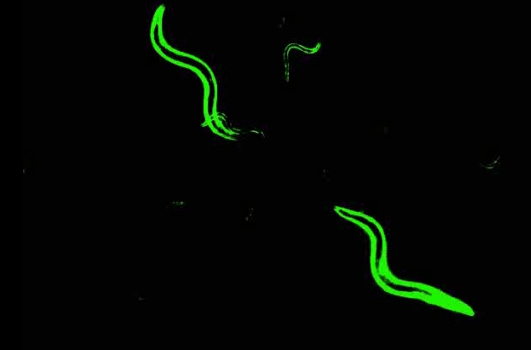
} **If you are interested in theoretical biochemistry / biomolecular simulation, this is your focal point program!**



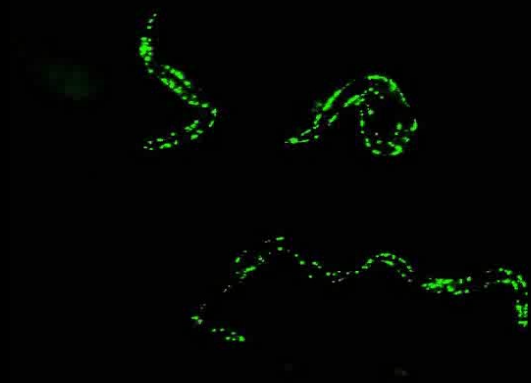
**Strong focus on theory & simulation possible, if desired.
Talk to me if you are interested.**

Example: The Ebbinghaus Group

Biophysical Chemistry



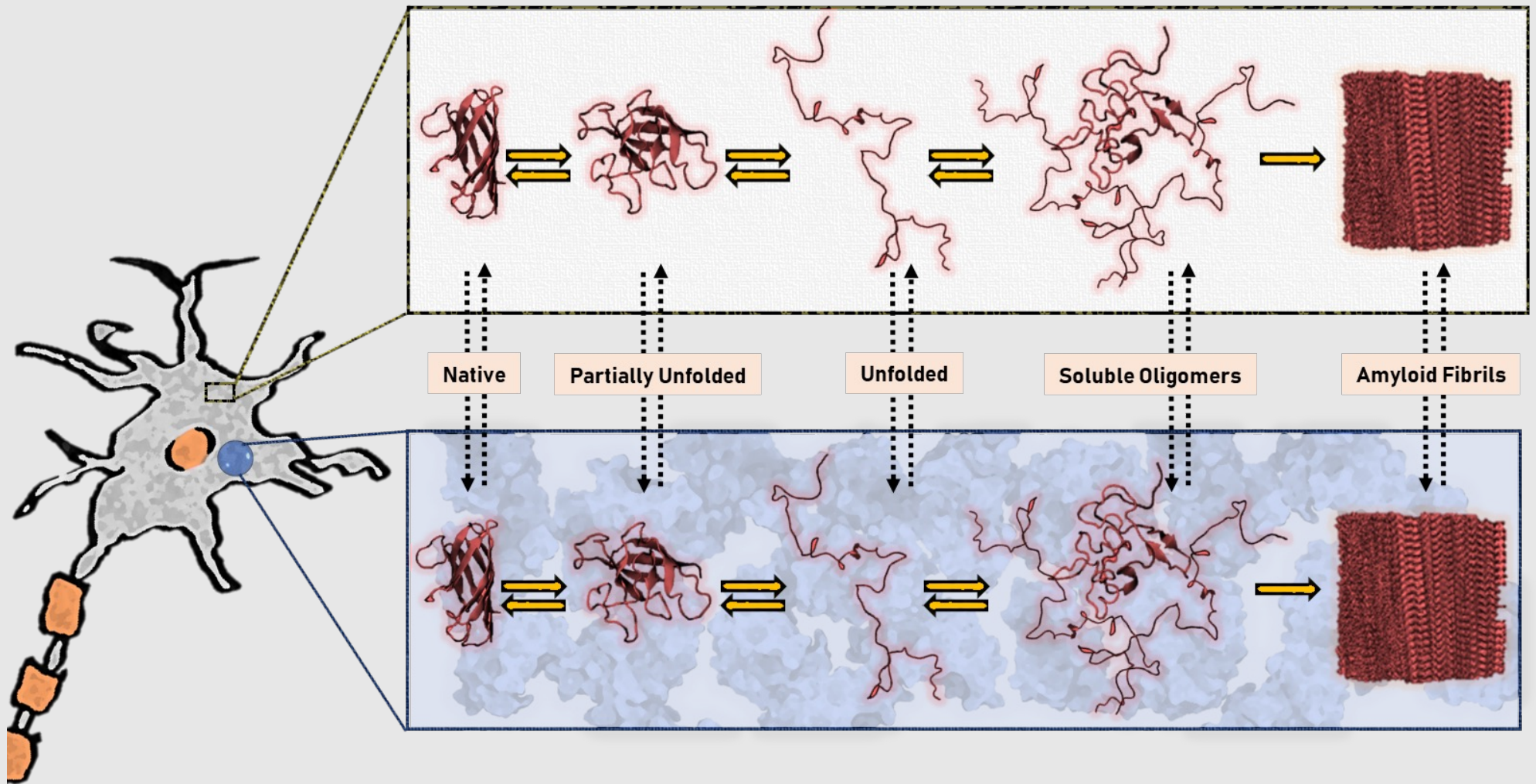
Q19-YFP in muscle cells of *C. elegans*



Q86-YFP in muscle cells of *C. elegans*

Gidalevitz, *et al.*, *Science*, 2006

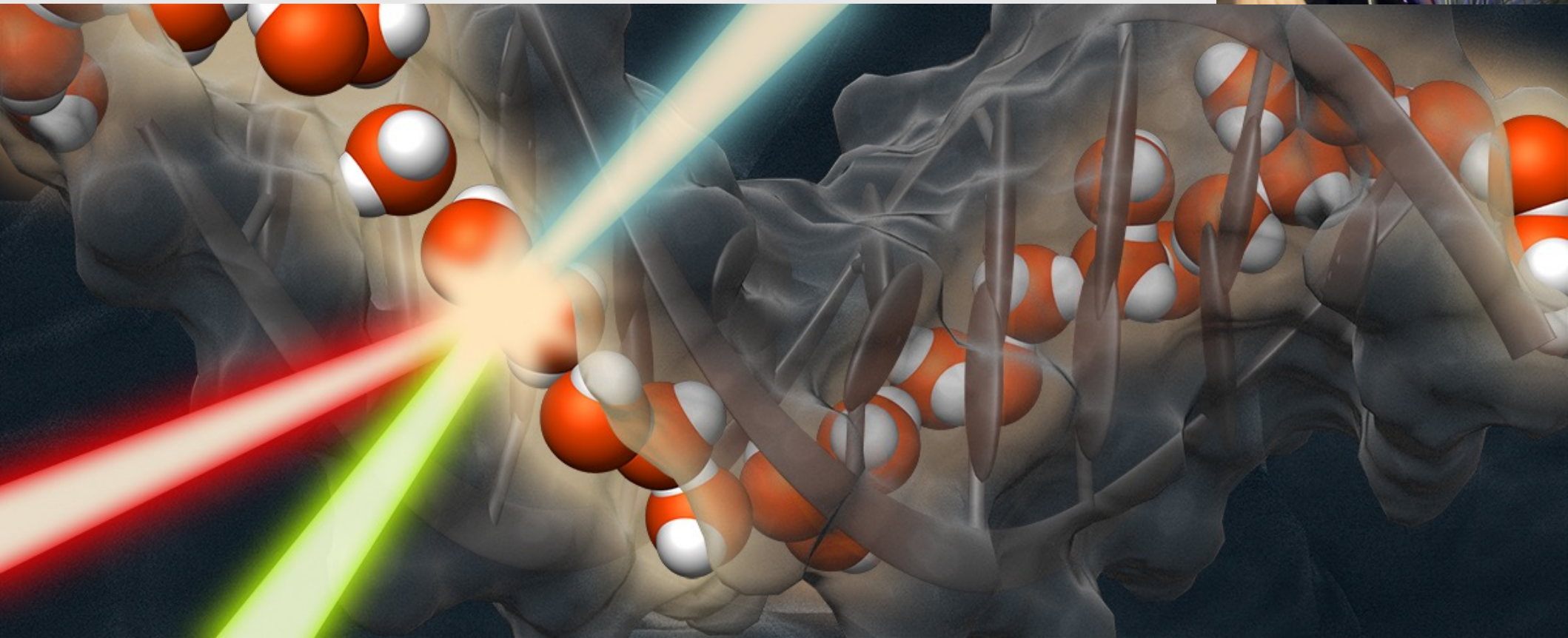
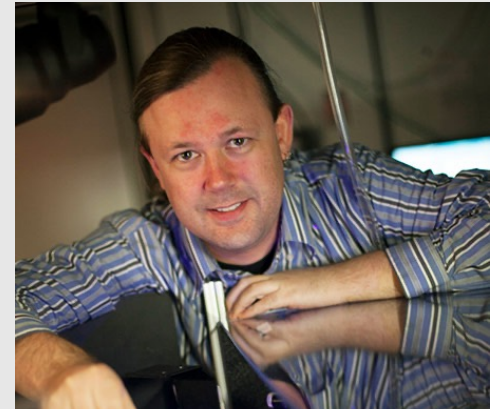
Example: The Ebbinghaus Group



Example: The Petersen group

- Biomolecules investigated by infrared spectroscopy



DNA's chiral hydration spine



Lots of other possibilities – have a look at the websites of the members of the focal point program...

...and check things out on Moodle

Moodle.rub.de

RUHR-UNIVERSITÄT BOCHUM LEARN2Gether ePortfolio ▾ OpenRUB Support  Deutsch (de) Lars Schäfer  ▾

Advanced

▾ **Practicals / Modulpraktika Bioche...**

- ▶ Teilnehmer/innen
- ▶ Badges
- ▶ Allgemein
- ▶ Informations Informations and time schedules /
- ▶ Informationen un...
- ▶ Focal point: Biomolecular Chemistry / Schwerpunkt ...
- ▶ Focal Point: Proteins in Biomedicine / Schwerpunkt...
- ▶ Focal Point: Molecular Biology and Biotechnology o...
- ▶ Focal Point: Biochemistry of

▶ **Alle aufklappen** ▾ **Alle schließen**

▶ **Informations**

Informations and time schedules / Informationen und Termine

▶ **Focal point: Biomolecular Chemistry / Schwerpunkt Biomolekulare Chemie /**

▶ **Focal Point: Proteins in Biomedicine / Schwerpunkt Proteine in der Biomedizin**

Focal Point: Molecular Biology and Biotechnology of Plants and Microorganisms /



▶ **Schwerpunkt Molekulare Biologie und Biotechnologie der Pflanzen und**

Dorothea Dietzel-Meyer

new course available for the first time slot
12. Okt, 17:59 Irmgard Dorothea Dietzel-Meyer

course assignments for the first time slot available
11. Okt, 21:35 Irmgard Dorothea Dietzel-Meyer

Ältere Themen ...

Neues im Kurs  

Aktivität seit Sonntag, 19. November 2017, 10:10

Alle Aktivitäten der letzten Zeit

Keine vorherige Aktivität

SCHWERPUNKT BIOMOLEKULARE CHEMIE

ÜBERBLICK UND MITGLIEDER DES SCHWERPUNKTES

RUB » Fakultät Chemie und Biochemie » Home

**LEHRBÖGEN MODULPRAKT.
(OFFERED MODULAR
ADVANCED PRACTICALS)**

**LEHRVERANSTALTUNGEN
DES SP (LECTURES)**

**RINGVORLESUNG IN NC
5/99**

**PRAKTIKA DES SP
(PRACTICALS)**

**BESCHREIBUNG DES SP
(DESCRIPTION)**

OVERVIEW ON FOCAL POINT BIOMOLECULAR CHEMISTRY

Biomolecular chemistry aims at providing molecular-level insights into biomolecular processes, which is a key prerequisite for understanding biomolecular systems. But maybe even more importantly, such detailed insights enable to actively modify and steer these processes, beyond time- and resource-intensive trial-and-error approaches. Examples encompass the targeted development of new drugs, the design of biological interfaces, and the engineering of proteins, nucleic acids, or other bio(inspired) molecules and their properties and functions, to name just a few. But biomolecular chemistry is not only a hot research topic in academia, as many recent Nobel prizes in chemistry unequivocally show, it is also highly relevant in industry. The goal of this focal point is to provide an overview over current research topics and cutting edge methods in this field. The focal point is structured into three major topics, which are closely intertwined: (i) synthesis, (ii) measurement & spectroscopy, and (iii) theory & simulation. Students can acquire individual competences in biomolecular chemistry through a range of specialization practicals and lectures offered in this focal point. For more details, follow the links at the left, and visit the websites of the individual research groups.

MITGLIEDER DES SCHWERPUNKTES - MEMBERS OF THIS FOCAL POINT

Leiter des Schwerpunktes - Head of Focal Point:

Prof. Dr. Lars Schäfer eMail: lars.schaefer@rub.de 

Lectures: Winter term

Have a look into the university calendar (Vorlesungsverzeichnis) for detailed descriptions of each lecture!

Lectures in the winter term (each 2 SWS + 1 SWS exercise = 5 CP):

- Bioinorganic Chemistry I (*181712, Metzler-Nolte*)
- Supramolecular Chemistry (*181746, Huber*)
- Theoretical Chemistry II: Dynamics and Simulation (*181770, Marx*)
- Biophysical Chemistry II (*181780*)
- Biomolecular Simulation: Understanding Experiments at the Molecular Level (*181972, Schäfer*)
- Concepts of Spectroscopy and Introduction to Laser Spectroscopy (*188151a*)
- ...

All lectures offered by members of the focal point can be chosen *as special lecture* (“Spezialvorlesung”) in the focal point

Lectures: Summer term

Have a look into the university calendar (Vorlesungsverzeichnis) for detailed descriptions of each lecture!

Lectures in the summer term (each 2 SWS + 1 SWS exercise = 5 CP):

- Lecture Series („Ringvorlesung“, 185810, all members of the focal point program)
- Bioinorganic Chemistry II (181015, Metzler-Nolte)
- Biophysical Chemistry I (184611)
- Organofluorine Chemistry (181 845, Huber)
- Electronic and Molecular Structure Theory (ThC III) (188271)
- Theoretical Spectroscopy (188275, Marx)
- ...

All lectures offered by members of the focal point can be chosen *as special lecture* (“Spezialvorlesung”) in the focal point

Practicals

- Semester 1: Modular advanced practical (185 710, „Modulpraktikum“)
 - 4 practicals, each 2 weeks (full time), 5 SWS = 4 CP (4x4 CP in total)
 - Can be chosen from any focal point programme
- Semester 2: advanced (in-depth) practicals (185 811 „Vertiefung/Schwerpunktpraktikum“)
 - 2x 8 CP = 16 CP (2x 4.5 weeks in 2 different groups)
 - Offered by all members of the focal point – just contact them! 😊
- Semester 3: research practical (185 912 „Spezialisierung“, 14 CP)
 - Offered by all members of the focal point – just contact them! 😊
- Semester 4: Master's thesis (30 CP)
 - Offered by all members of the focal point – just contact them! 😊
- **If you plan a stay abroad / select lectures or practicals from other focal points, talk to me! We will find a solution in your interest!**

Questions?

Do not hesitate to contact me, in person or via email: lars.schaefer@rub.de

Check out the “Vorlesungsverzeichnis” for detailed descriptions of every lecture

www.rub.de/bc-schwerpunkte/biomol.htm

Also have a look at the websites of the members of the focal point programme

If you are interested, talk to me and/or the other members of the focal point program *Biomolecular Chemistry*

SCHWERPUNKT BIOMOLEKULARE CHEMIE

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