

TUD Master (Molecular Bioengineering):  
Cellular Machines I (SS 2017)  
(2 SWS Lecture, 2 SWS Seminar, 2 SWS Practical)

TUD Master (Nanobiophysics):  
Biological Nanomachines (SS 2017)  
(2 SWS Lecture, 2 SWS Seminar, part of Applied Nanotechnology)

TUD Master (Physics): Minor (Molecular Bioengineering, Cellular Machines)  
Cellular Machines I: From Cellular Function to Technol. Applications (SS 2017)  
(2 SWS Lecture, 2 SWS Seminar)

TUD Diploma (Maschinenwesen):  
Grundlagen und Anwendung Zellärer Maschinen (SS 2017)  
(2 SWS Lecture)

---

LECTURES: Mo 3:00 pm – 4:20 pm, CRTD (Fetscher Str. 105) lecture hall (right half)  
SEMINARS: Mo 4:40 pm – 6:10 pm, CRTD (Fetscher Str. 105) lecture hall (right half)  
PRACTICALS: for TUD Master Course on Molecular Bioengineering only, details will follow

<u>LECTURE</u>	Stefan Diez	stefan.diez@tu-dresden.de	463-43010
<u>ORGANIZERS:</u>	Michael Schlierf	michael.schlierf@tu-dresden.de	463-43050

---

Course Information:

- All information including lecture notes at <https://intranet.crt-dresden.de/students/literature-slides.html>
- General information also at <http://www.mpi-cbg.de/~diez/CellMach2017Gen.pdf>
- List of lecture notes also at <http://www.mpi-cbg.de/~diez/CellMachSSRef>  
(login: cellular and password: machines2010)
- See also: <http://www.bcube-dresden.de/research-groups/diez/teaching>

Grades:

- TUD Master Course (Molecular Bioengineering):  
50% oral examination (15-20 min in the weeks after the WS 2017/18 lecture period)  
30% oral presentation (30 min) during the seminars (referate)  
20% lab protocol (written during the practical)
- TUD Master Course (Nanobiophysics):  
60% oral presentation (30 min) during the seminar (referate)  
40% oral examination (with Bernd Büchner about the other 2 SWS Lecture)
- TUD Master (Physics):  
1/2 oral examination (20 min in the weeks after the WS 2017/18 lecture period)  
1/2 oral presentation (30 min) during the seminars (referate)
- TUD Diploma (Maschinenwesen):  
100 % oral examination (20 min in the weeks after the lecture period)

Referates (for Master Students Molecular Bioengineering, Nanobiophysics and Physics):

- One group of 3-4 students per seminar will present the work of one important lab/person in the field of Cellular Machines. The labs/persons are specified beforehand and the total presentation time (including discussion) should be about 60 minutes.
- The presentations should be structured as following:
  - a) first speaker presents the CV of the principal investigator, including major career steps and introduction to the general field of research of the presented lab/person
  - b) 2-3 speakers present a detailed description of 2-3 breakthroughs (major papers, each about 10-15 min, at least one classic and one recent) from that lab
  - c) all speakers wrap-up by a discussion about the importance of this work + outlook
- Grades will be given to the students individually.
- Students are encouraged to present as lively as possible. Questions from the audience during the presentation are encouraged.
- Labs/persons to be presented:
  - Hagan Bayley, Oxford (ion channels and pores, DNA sequencing)
  - Nadrian Seeman, New York University (DNA nanotechnology)
  - Craig Venter, JCVI La Jolla (DNA sequencing, human genome project)
  - Taekjip Ha, JHU (single molecule techniques, DNA studies)
  - Carlos Bustamante, UC Berkeley (optical and magnetic traps, DNA mechanics)
  - Robert Lefkowitz, Duke University (G protein-coupled receptors)
  - Jack Stozack, Harvard (Telomere, directed evolution, origin of life)
  - F-Ulrich Hartl, München (chaperones)
  - Kazuhiko Kinosita, Waseda (died recently) (FoF1 atpase, single-molecule)
- Each presenting group of students should, at the day of the presentation, hand in an A4 hardcopy of the talk and send the electronic file afterwards to stefan.diez@tu-dresden.de
- We will aim to prepare the lecture handouts before the lectures, check on the BIOTEC Intranet (or on <http://www.bcube-dresden.de/research-groups/diez/teaching> ) on Monday morning before the lecture.
- All students who are not presenting talks themselves are welcome to stay during the seminars and participate in the discussions. The content of the seminars will be part of the oral examinations for MBE and Physics students.

Lecture Topics (tentative schedule - changes possible):

#	Date	Topic	Referates (NBP / MBE+PHYS)
0	3.4.	Introduction (Diez/Schlierf)	no seminar
1	10.4.	Lipid Bilayer Systems (Diez)	no seminar
-	17.4.	--- (Holiday – Easter)	---
2	24.4.	Membrane Transporters (Diez)	Hagan Bayley
-	1.5.	--- (Holiday – 1st of May)	---
3	8.5.	DNA Origami + Walkers (Schmidt)	Nadrian Seeman
4	15.5.	Aptamers/Riboswitches (Schmidt)	Craig Venter
5	22.5.	DNA Replication Fork (Schlierf)	Taekjip Ha
6	29.5.	RNA Polymerase (Jahnel)	Carlos Bustamante
-	5.6.	---- (Holiday - Pfingsten)	---
7	12.6.	Photoreception (Ader)	Robert Lefkowitz
8	19.6.	Origin of Life (Kreysing)	Jack Stozack
9	26.6.	Chaperones (Schlierf)	Ulrich Hartl
10	3.7.	Energy Conversion (Schlierf)	Kazuhiko Kinosita
-	10.7.	---- (Repetition - self-study)	---