

TUD Master (Molecular Bioengineering):
Cellular Machines I (SS 2018)
(2 SWS Lecture, 2 SWS Seminar, 2 SWS Practical)

TUD Master (Nanobiophysics):
Biological Nanomachines (SS 2018)
(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 2018)
(2 SWS Lecture, 2 SWS Seminar)

TUD Diploma (Maschinenwesen):
Grundlagen und Anwendung Zellärer Maschinen (SS 2018)
(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/CellMach2018Gen.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 2018/19 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 2018/19 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 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 follows:
 - a) All three speakers together present the CV of the principal investigator, including major career steps and introduction to the general field of research of the presented lab/person
 - b) Each speaker then presents a detailed description of one breakthrough (usually based on one major publication) during 12-15 min. As a group, please aim at presenting at least one classic publication (from the early times) and one recent publication of the research group.
 - 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:
 - Erwin Neher, Göttingen (ion channels)
 - David Bensimon, Paris (single molecule biophysics, evolution)
 - Paul Rothmund, Caltech (DNA structures and programming)
 - Hermann Gaub, Munich (protein folding)
 - Robert Austin, Princeton (microfluidics, biofuel)
 - Ben Feringa, Groningen (molecular machines)
 - Pamela Silver, Harvard (synthetic biology)
 - Petra Schwille, MPI Martinsried (artificial cells)
 - Howard Berg, Harvard (bacterial chemotaxis)
 - Chris Summerville, Berkeley (synthesis of structural components in plant)
- Each presenting group of students should, at the day of the presentation, hand in an A4 hardcopy of the talk and send (before the presentation) the electronic file (pdf) to stefan.diez@tu-dresden.de
- We will aim to prepare the lecture handouts before the lectures, check on the CRTD 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 expected 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	9.4.	Introduction (Diez/ Schlierf)	no seminar
1	16.4.	Lipid Bilayer Systems (Diez)	no seminar
2	23.4.	Membrane Transporters (Diez)	Erwin Neher
-	30.4.	--- Brückentag ---	---
3	7.5.	DNA Motors (Schlierf)	David Bensimon
4	14.5.	DNA Origami + Walkers (Schmidt, cfaed)	Paul Rothmund
-	21.5.	---- (Holiday - Pfingsten) ---	---
5	28.5.	Chaperones (Schlierf)	Hermann Gaub
6	4.6.	Energy Conversion (Schlierf)	Robert Austin
7	11.6.	BIOMOD (students)	Ben Feringa
8	18.6.	Photoreception (Ader, CRTD)	Pamela Silver
9	25.6.	Origin of Life (Kreysing, MPI-CBG)	Petra Schwille
10	2.7.	Cellulose Synthase (Schneider, Potsdam)	Chris Summerville
11	9.7.	Bacterial Locomotion (Diez)	Howard Berg
-	16.7.	--- (Repetition - self-study) ---	---