

Bachelor Module

Methods in Molecular Cell Biology

The module includes lecture, seminars and practical training. This module focuses on deepening basic knowledge and extending skills in current molecular biological methods around the central themes DNA, proteins and cell culture. Topics of the lecture block are:

- DNA and nucleic acids, structure and function
- Nucleic acid isolation methods and analysis
- Proteins, structure and function
- Protein isolation methods and analysis
- Cell culture and cell lysis
- Microscopy: principles and applications of classical transmitted light microscopy
- Principles and applications of fluorescence and confocal microscopy
- Other fluorescence-based methods in molecular cell biology

The **seminar block** highlights selected methods. Based on selected research articles small groups of students prepare and present a method's principle and application in a short talk. Seminar talks and subsequent discussion will count to the final grade.

The **practical block** allows groups of students to work on individual projects within our group's research interests. Laboratory work and project documentation will count to the final grade.

Projects include:

- development of a cloning strategy
- generation of recombinant constructs
- transfection of mammalian cells with the fusion constructs
- characterization of fusion proteins with biochemical methods and fluorescent microscopy

In addition to our course guide we recommend relevant review and research papers as well as general cell biology text books:

- Alberts, Molecular Biology of the Cell
- Lodish, Molecular Cell Biology
- Pollard and Earnshaw, Cell Biology

Cell & molecular protocol collections:

- Green, Sambrock and MacCallum; Molecular Cloning: A Laboratory Manual
- Harlow & Lane, Antibodies: A Laboratory Manual
- Freshney; Culture of Animal Cells: A Manual of Basic Technique

Databases and web-resources:

- <http://www.ncbi.nlm.nih.gov/>
- <http://www.microscopy.fsu.edu/primer/index.html>

All relevant information can be found in Moodle.