# M4461 - Integrative Topics in Cell Biology

## Integrative Topics in Cell Biology

### Coordinator (responsible lecturer)
Prof. Dr. Markus Pauly (m.pauly@hhu.de)

### Lecturers
Prof. Dr. Hermann Aberle, Prof. Dr. Ilka Axmann, Prof. Dr. Petra Bauer, Jun. Prof. Dr. Mathias Beller, Jun Prof. Alexander Buell, Prof. Dr. Michael Feldbrügge, apl. Prof. Dr. Ursula Fleig, Dr. Sven Gould, Prof. Dr. Thomas Klein, PD Dr. Nicole Linka, Prof. Dr. Markus Pauly, Prof. Dr. Rüdiger Simon, Jun Prof. Dr. Ingrid Span, Dr. Yvonne Stahl, Prof. Dr. Andreas Weber

### Status:
04.02.2019

### Semester:
1. – 2.

### Contact and organization
Prof. Dr. Markus Pauly (m.pauly@hhu.de)

### Mode:
optional compulsory course

### Workload
420 h

### Credit points
14 CP

### Contact time
225 h

### Self-study
195 h

### Course components
<table>
<thead>
<tr>
<th>Practical course:</th>
<th>18 SWS</th>
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<tbody>
<tr>
<td>Lectures/Seminar:</td>
<td>2 SWS</td>
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### Frequency
every winter-term

### Group size
32

### Duration
1 semester

### Learning outcomes/skills
Students have learned the concepts and methods of modern cell biology and are capable of using them. They have adopted genetic, cell, molecular biological and biochemical techniques and can apply these techniques independently. Students are familiar with the major scientific equipment and are capable of using the instruments precisely and independently. Students will learn to work in teams.

### Forms of teaching
Lectures, Experimental practicals

### Content

#### Lectures:
The module is based on the book Alberts et al., “Molecular Biology of the cell”, 6th edition plus in depth primary literature. Students are expected to read prior to a lecture specified chapters.

#### Organisation of the cell:

#### Cells in their social context:

#### Practical course:
The practical course will cover modern methods in molecular biology: e.g. DNA and RNA isolation methods, gel-electrophoresis, PCR, vector construction, transformation of organisms; cell biology: e.g. light and fluorescence microscopy; biochemistry: e.g. immuno-localization and purification of proteins, analysis of enzyme kinetics and regulatory properties of proteins,
carbohydrate analysis.
The practical course will consist of research projects in the laboratories of the participating lecturers. The laboratory can be chosen according to the student team’s interest. The methods to be learned will depend on the research project.

**Eligibility**
**Formal:** Admission to Master program  
**Content-related:** Students must be familiar with elementary molecular, microbiological, and biochemical laboratory techniques.

**Examination types**
Learning portfolio consisting of:
(1) Knowledge base (70% of final grade): written examination on the contents of lectures  
(2) Documentation (30% of final grade): Oral presentation or protocol (analysis and discussion of the experiments)

**Requirements for the award of credit points for this course**
(1) Passing the knowledge test  
(2) Participating regularly and actively in the practical course

**Relevant for following study programs/major**
M.Sc. Biologie  
Major:
- Synthetic Biology and Biotechnology  
- Molecular Ecology and Evolution  
- Physiology and Development  
- Structural Biology

**Compatibility with other curricula**
M. Sc. Biochemie

**Significance of the mark for the overall grade**
The mark given will contribute to the final grade in proper relation to its credits.
M.Sc. Biologie 14/72 CP (2-years program)

**Course language**
- German
- English
- German and English
- German, English on demand

**Additional information**
Enrolling into the module is granted by the central study office of the Department of Biology. The practical course will be done as an independent research project (6 weeks) in the laboratory of one of the participating lecturers. Students should form teams of two to carry out the research project. The laboratory can be chosen according to the student team’s interest and the timing is flexible. From summer semester 2019 students can only choose one “Integrative Topics in ….” module.
### M4461a - Integrative Topics in Cell Biology

**Coordinator (responsible lecturer)**
Prof. Dr. Markus Pauly (m.pauly@hhu.de)

**Status:**
01.10.2020

**Lecturers**
Prof. Dr. Hermann Aberle, Prof. Dr. Ilka Axmann, Jun. Prof. Dr. Mathias Beller, Jun Prof. Alexander Buell, Prof. Dr. Michael Feldbrügge, apl. Prof. Dr. Ursula Fleig, Dr. Sven Gould, Prof. Dr. Thomas Klein, PD Dr. Nicole Linka, Prof. Dr. Markus Pauly, Prof. Dr. Rüdiger Simon, Jun Prof. Dr. Ingrid Span, Dr. Yvonne Stahl, Prof. Dr. Andreas Weber

**Semester:**
Since 1.

**Contact and organization**
Prof. Dr. Markus Pauly (m.pauly@hhu.de)

**Mode:**
optional course

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**Course components**

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### Learning outcomes/skills
Students have learned the concepts and methods of modern cell biology and are capable of using them. They have adopted genetic, cell, molecular biological and biochemical techniques and can apply these techniques independently. Students are familiar with the major scientific equipment and are capable of using the instruments precisely and independently. Students will learn to work in teams.

### Forms of teaching
Lectures, Experimental practicals

### Content

**Lectures (virtuel, but live):**
The module is based on the book Alberts et al., “Molecular Biology of the cell”, 6th edition plus in depth primary literature. Students are expected to read prior to a lecture specified chapters.

**Organisation of the cell:**

**Cells in their social context:**

**Practical course:**
The practical course will cover modern methods in molecular biology: e.g. DNA and RNA isolation methods, gel-electrophoresis, PCR, vector construction, transformation of organisms; cell biology: e.g. light and fluorescence microscopy; biochemistry: e.g. immuno-localization and purification of proteins, analysis of enzyme kinetics and regulatory properties of proteins, carbohydrate analysis.

The practical course will consist of research projects in the laboratories of the participating
lecturers observing corona pandemic distancing. The laboratory can be chosen according to the student team’s interest. The methods to be learned will depend on the research project.

**Eligibility**

**Formal**: Master-student

**Content-related**: Students must be familiar with elementary molecular, microbiological, and biochemical laboratory techniques.

**Examination types**

1. Knowledge base (70% of final grade): written examination on the contents of lectures
2. Documentation (30% of final grade): Oral presentation or protocol (analysis and discussion of the experiments)

**Requirements for the award of credit points for this course**

1. Passing the knowledge test
2. Participating regularly and actively in the practical course

**Relevant for following study programmes/major**

M.Sc. Biology

**Compatibility with other curricula**

M. Sc. Biochemistry

**Significance of the mark for the overall grade**

The mark given will contribute to the final grade in proper relation to its credits. M.Sc. Biology 14/80 CP (2-years program) (14/78 CP 1-year program)

**Course language**

English

**Additional information**

Enrolling into the module is granted by the central study office of the Department of Biology. The practical course will be done as an independent research project (6 weeks) in the laboratory of one of the participating lecturers. The laboratory can be chosen according to the student team’s interest and the timing is flexible.