### Title of the module
Basics in biomolecular medicine

### Term/semester
Winter term / 1

### VAK-Number
Will be assigned centrally

### Credit points
6 ECTS

### Compulsory/elective course
Compulsory course

### Teaching methods

<table>
<thead>
<tr>
<th>Method</th>
<th>SWS</th>
<th>CP</th>
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<tbody>
<tr>
<td>Lecture</td>
<td>2 (28h)</td>
<td>3</td>
</tr>
<tr>
<td>Exercises</td>
<td>2 (28h)</td>
<td>3</td>
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### Self study
Self studies and learning for the exam 124 h

### Module representative
Prof. B. Reinhold-Hurek

### Instructor
- Prof. B. Reinhold-Hurek
- Dr. K. Maedler
- Prof. R. Stick
- Prof. A. Dotzauer

### Examiner
- Prof. B. Reinhold-Hurek
- Dr. K. Maedler
- Prof. R. Stick
- Prof. A. Dotzauer

### Objectives

**Dotzauer:**
Impartment of the principles of viral transmission, replication and virus-cell interactions to understand the molecular mechanisms resulting in viral diseases.

**Reinhold-Hurek:**
Increase knowledge on microbial diversity, principles of identification and interaction mechanisms

**Stick:**
Understanding the molecular basis of antibody diversity.

Exemplifying the relationship between protein structure, cellular structure and inherited disease: lessons from cytokeratins and nuclear lamins.

**Maedler:**
To understand the molecular mechanisms of glucose homeostasis, cellular interactions, the pathophysiology of diabetes, cell proliferation, neogenesis and apoptosis.

**Summary:**
Impartment of the meaning and consequences of pathogenetic molecular mechanisms and of dysfunctions in biochemical processes and interactions with regard to the development of diseases.

### Content of teaching

**Dotzauer:** Biochemistry of viruses and infectious diseases
- principles of and concepts in virology
- transcriptional regulation
- protein processing
- protein structure
- macromolecular assembly
- cell cycle control
- signal transduction
- innate and adaptive immune responses
- immune evasion
- molecular mechanisms of virus effects in infection
- pathogenesis of viral infections
- anti-viral drugs / vaccines (prevention and control of diseases)
- discussion of individual viruses, relevant for human diseases
- development and use of viral expression vectors

**Reinhold-Hurek:** Interactions between microorganisms and eukaryotes
- Microbial Diversity
- Methods of detection and identification of microorganisms
- Examples for mechanisms of interaction between bacteria and eukaryotes,
- Quorum sensing

**Stick:** Antibody structure
- Gene organisation of immunoglobulin genes in the germ line
- Rearrangement of immunoglobulin genes during B-cell development

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August 2010
**Educational objectives**

<table>
<thead>
<tr>
<th>Dotzauer:</th>
<th>Ability to understand advanced contents of virology and immunology.</th>
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<td>Ability to understand principles of pathobiochemical and pathogenetic processes and their meaning in development of diseases (pathogenetic principles).</td>
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</table>

**Reinhold-Hurek:**

- Ability to understand advanced contents of functional diversity of microorganisms and their interactions with hosts

**Stick:**

- Ability to understand principles of antibody structure and generation of antibody diversity
- Ability to understand principles of the cytoarchitecture of epithelial cells and the nuclear architecture and basics of diseases related to these cytoskeletal elements

**Maedler:**

- Ability to understand advanced contents in metabolic diseases and principles of metabolic research in vivo and in vitro.

**Summary:**

- Ability to understand principles of molecular processes and mechanisms causing disease and of molecular characteristics of diseases.

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**Evaluation of learning progress**

- Discussion of actual topics.

**Assessment**

- Written test (100%)

**Frequency**

- Winter term

**Usage in other degree programmes**

- No

**Requirements**

- Admission to the master course "Biochemistry and Molecular Biology"