neu170 - Molecular Genetics and Cell Biology

Module label: Molecular Genetics and Cell Biology
Module code: neu170
Credit points: 15.0 KP
Workload: 450 h

Used in course of study:
- Master's Programme Neuroscience > Background Modules

Module responsibility:
- John Neidhardt

Authorized examiners:
- Alle hier genannten

Module counseling:
- Karl-Wilhelm Koch
- Kathrin Thedieck

Entry requirements:
+ Neurosci. knowlg. + Expt. methods Independent research + Scient. literature + Social skills
++ Interdiscipl. knowlg. Maths/Stats/Progr. Data present./disc. + Scientific English Ethics

Students interested in molecular genetics, cell biology, molecular biology, and neurobiology will achieve the knowledge after completion of the course:
- Genetic basis of diseases, inheritance patterns of diseases and gene therapeutic approaches
- Cell nucleus and genomic DNA, Nucleic acid structure and function
- Signaling and Cancer
- Gene expression
- RNA Processing
- Translation
- structures of proteins and protein functions
- Membranes and membran proteins
- Energie metabolism in the cell
- sequencing techniques and knowledge of several other selected lab techniques
- Basic knowledge of how to perform research projects.

Skills to be acquired in this module:
- Genetic basis of diseases, inheritance patterns of diseases and gene therapeutic approaches
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- Signaling and Cancer
- Gene expression
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Module contents:
Subjects of the lecture and seminar:
- Storing and processing of genetic information
- mutation analysis
- genetic high throughput techniques
- structure and function of proteins/membranes, cytoskeleton, meta-bolic signaling, molecular basis of neurodegenerative diseases.

Exercises: Learning current methods of human genetics, cellular and molecular neurobiology; introduction to cell cultivation techniques.
- DNA extraction and agarose gel analysis
- Sanger sequencing and sequence analysis
- PCR-based techniques
- bioinformatic analysis of high throughput data
- cell culture
- gene therapy of dominant diseases

Reader's advisory:
Several selected scientific papers for the seminar (selection may vary)
Textbooks of Molecular Cell Biology; Alberts, Molecular biology of the cell

Links:
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Reference text: Course in the first half of the semester
Modullevel: MM (Mastermodul)
### Modulart

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<tr>
<th>Lern-/Lehrform / Type of program</th>
<th>Wahlpflicht</th>
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<th>Vorkenntnisse / Previous knowledge</th>
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### Examination

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<tr>
<th>Examination</th>
<th>Time of examination</th>
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<tbody>
<tr>
<td>Final exam of module</td>
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<td>70% written exam, 30% presentation(s)</td>
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<td>Presentation(s) within the frame of the seminar. Regular active participation is required for the module to be passed.</td>
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<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Lecture</td>
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<td>2.00</td>
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<td>28 h</td>
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<td>Exercises</td>
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<td>84 h</td>
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<tr>
<td>Seminar</td>
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<td>2.00</td>
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<td>28 h</td>
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| Total time of attendance for the module | 140 h |

**Frequency**

- Lecture: 2.00
- Exercises: 6.00
- Seminar: 2.00

**Workload attendance**

- 28 h
- 84 h
- 28 h

**Total time of attendance for the module**: 140 h