

<b>Title of module</b>	<b>XI Lab Bench Project and Grant Writing (Wahlpflichtmodul)</b>
<b>Course instructor</b>	<b>Prof. Dr. Beate Brand-Saberi</b>

<b>Credit points</b>	17	<b>Semester(s) in which the module is taught</b>	3
<b>Contact hours</b>	16	<b>Workload</b>	480 hours

<b>Lecturer(s)</b>	All PIs from the associated labs
<b>Type of teaching</b>	The module "Lab Bench Project and Grant Writing" consists of the lecture "Advances in Stem Cell Research" (2 CP), a seminar and laboratory work (14 CP).  Advances: Lecture 1 hours per week, Seminar 1 hour per week Lab Bench: Practical work: 13 hours per week, Seminar 1 hour per week
<b>Relation to curriculum</b>	Compulsory; elective
<b>Recommended prerequisites</b>	Module I "Stem Cell Physiology", module III "Stem Cell Practical Courses", module VIII "Stem Cell Lecture Series" and module X "Lab Rotation" are recommended
<b>Aims</b>	The students will be enabled to plan, perform and interpret lab experiments choosing from a range of particular methods to solve a particular scientific question. They will also be able to design a research proposal for a suitable funding source.
<b>Learning outcome</b>	<p>Knowledge:          The students have gained knowledge in relevant topics in stem cell research by gaining an advanced insight into relevant research fields and identifying relevant research methods. They have obtained knowledge of funding agencies.</p> <p>Skills:          Students have a command on particular research methods and the ability to document data. They can interact with others in a laboratory environment</p> <p>Competencies:          The students are able to participate actively in planning research projects and to identify relevant research methods. They can interpret obtained research data. They are capable of assembling a research proposal. Students have gained in self-dependence, responsibility and self-organization.</p>
<b>Contents of module</b>	<p>Seminar topics comprise:          Relevant methods available in the lab of choice          Lab security          Standards of documentation          What is a control?          Structure of research proposals          Funding agencies</p> <p>The lectures "Advances in Stem Cell Research" will be given by international experts in the field and present cutting edge research. Accordingly, lectures will vary from year to year.</p>
<b>Study and examination requirements;</b>	Regular laboratory reports; students performance during discussions and interactions in the context of the lab bench project and in the seminar and lectures with lecturers and fellow students; Summaries of lectures.

<b>Forms of examination</b>	The assessment will be done on the basis of a written research proposal according to intramural or DFG funding standards
<b>Literature</b>	<p>Yusuf F. and Brand-Saberi B. (2012). Myogenesis and muscle regeneration. <i>Histochemistry and Cell Biology</i>, 138(2):187-199</p> <p>Lafenetre P, Leske O, Wahle P, Heumann R. (2011). The beneficial effects of physical activity on impaired adult neurogenesis and cognitive performance. <i>Front. Neurosci.</i> doi: 10.3389/fnins.2011.00051.</p> <p>Manns, M., Leske, O., Gottfried, S., Bichler, Z., Lafenetre, P., Wahle, P., and Heumann, R. (2011). Role of neuronal ras activity in adult hippocampal neurogenesis and cognition. <i>Front Neurosci</i> 5, 18. Full text pdf</p> <p>Squire, Berg, Bloom, du Lac, Ghosh, Spitzer. <i>Fundamental Neuroscience</i>, 3rd Ed. AP (2008)</p> <p>Confocal Microscopy Methods and Protocols. Stephen W. Paddock (ed.) "Methods in Molecular Biology", v. 123, Humana Press.</p> <p>Electron Microscopy Methods and Protocols M A Nasser Hajibagheri, (ed.), 1999, "Methods in Molecular Biology", v. 117, Humana Press</p> <p>Microscopy and Histology for Molecular Biologists: A Users Guide (2002). J. Kiernan and I. Mason (eds.) Portland Press limited.</p> <p>Theiss C, Meller K (2012). Fluorescence Proteins and Time-Lapse Imaging of the Cytoskeleton. <i>Protocols in Neuroscience, Interdisciplinary Methods for Investigation of the Cytoskeleton</i>. Ed.: R. Dermietzel. Springer Press.</p> <p>Stem Cells from Adult Human Inferior Turbinate STEM CELLS AND DEVELOPMENT Volume 21, Number 5, 742–756</p> <p>Hennen E, Faissner A (2012) LewisX: a neural stem cell specific glycan? <i>Int J Biochem Cell Biol</i> 44:830-833.</p> <p>Kim, et. al., (2009) Direct reprogramming of human neural stem cells by OCT4 <i>Nature</i> 461: 649-653.</p> <p>Kögler et al. (2004) A New Human Somatic Stem Cell from Placental Cord Blood with Intrinsic Pluripotent Differentiation Potential <i>JEM</i> 200 no. 2 123-135</p> <p>"Vertebrate Myogenesis: Stem Cells and Precursors" Beate Brand-Saberi (ed.) Springer-Verlag 2014, Problems and Results in Cell Differentiation</p> <p>Denecke B, Horsch LD, Radtke S, Fischer JC, Horn PA, Giebel B. Human endothelial colony-forming cells expanded with an improved protocol are a useful endothelial cell source for scaffold-based tissue engineering. <i>J Tissue Eng Regen Med</i>. 2013 epub</p> <p>Klump H, Teichweyde N, Hinrichs C, Horn PA. Development of patient-specific hematopoietic stem and progenitor cell grafts from pluripotent stem cells, in vitro. <i>Current Molecular Medicine</i>. 2013</p>