

PhD Program Regenerative Sciences – Curriculum

Chairman of program committee: Professor Ulrich Martin
 Vice-chairwoman: Professor Ina Gruh

Times (in general):

Tutorials Thursday, 3.00 – 4.00 pm
 Seminars Thursday, 4.15 – 5.45 pm

21st May 2020 is Ascension Day ('Christi Himmelfahrt') which is a public holiday. Therefore, this week's teaching is shifted to 19th May 2020.

Exceptions in day and time are printed in **bold**.

Locations (in general)

Semester 1 & 2 MHH, building I/J 04, level 01, HBRS seminar room 1140
 Semester 3 & 4 MHH, building I/J 11, Hans-Borst-Zentrum (HBZ), level S0, seminar room 6040

Exceptions in location are marked **.

1 st semester				
Introductory lecture Welcome address, the curriculum of REBIRTH & HBRS, Q & A, Principles of regenerative sciences and the REBIRTH approach	seminar**	Monday, 02.10.2019	2.00 – 3.00 pm	Ina Gruh
Principles of growth factor signalling 1 - Paracrine and juxtacrine signaling - Signalling pathways involved in the regulation of growth	seminar	Thursday, 17.10.2019	4.15 – 5.45 pm	Rainer Niedenthal
	tutorial	Thursday, 24.10.2019	3.00 – 4.00 pm	Rainer Niedenthal
Principles of growth factor signalling 2 Cytokines, hormones, and their receptors	seminar	Thursday, 24.10.2019	4.15 – 5.45 pm	Michael Morgan
	tutorial**	Tuesday, 05.11.2019	3.00 – 4.00 pm	Michael Morgan
Basic mechanisms of inflammation 1 Innate and adaptive immunity and differentiation	seminar**	Tuesday, 05.11.2019	4.15 – 5.45 pm	Siegfried Weiß
	tutorial	Thursday, 07.11.2019	3.00 – 4.00 pm	Siegfried Weiß
Principles of developmental biology and organogenesis 1 - Commitment, differentiation, apoptosis, patterning - Morphogenetic gradients and cell-cell communication - Genetic and epigenetic mechanisms	seminar**	Tuesday, 12.11.2019	4.15 – 5.45 pm	Andreas Kispert
	tutorial**	Tuesday, 19.11.2019	3.00 – 4.00 pm	Andreas Kispert

Principles of developmental biology and organogenesis 2 - Model systems in developmental Biology Embryogenesis and fetal development	seminar	Thursday, 14.11.2019	4.15 – 5.45 pm	Achim Gossler
	tutorial	Tuesday, 26.11.2019	3.00 – 4.00 pm	Achim Gossler
Principles of stem cell biology 1 - Embryonic derivation of stem cells - Culture methods	seminar*	Thursday, 28.11.2019	3.00 – 4.30 pm	Thomas Müller
	tutorial*	Thursday, 28.11.2019	4.45 – 5.45 pm	Thomas Müller
Principles of stem cell biology 2 - Tumor stem cells and mechanisms of transformation - Principles of cell cycle regulation	seminar	Thursday, 05.12.2019	4.15 – 5.45 pm	Amar Deep Sharma
	tutorial	Thursday, 12.12.2019	3.00 – 4.00 pm	Amar Deep Sharma
Principles of chromosomal instability	seminar	Thursday, 12.12.2019	4.15 – 5.45 pm	Gudrun Göhring
	tutorial	Thursday, 19.12.2019	3.00 – 4.00 pm	Gudrun Göhring
Cellular senescence, tumor suppression and organismal aging	seminar**	Tuesday, 07.01.2020	3.00 – 4.15 pm	Anette Melk
	tutorial	Thursday, 09.01.2020	3.00 – 4.00 pm	Anette Melk
Principles of cell engineering 1 - MicroRNAs (miRNA) and downstream targets - technical approaches - Use of miRNA target identification software - Design of miRNA - Luciferase-gene reporter assays (tutorial)	seminar	Thursday, 09.01.2020	4.15 – 5.45 pm	Thomas Thum
	tutorial	Thursday, 16.01.2020	3.00 – 4.00 pm	Jan Fiedler

Principles of cell engineering 2 - Transient DNA delivery - Episomal maintenance - Stable DNA delivery - Homologous recombination - Site-specific DNA modification	seminar	Thursday, 16.01.2020	4.15 – 5.45 pm	Axel Schambach
	tutorial	Thursday, 23.01.2020	3.00 – 4.00 pm	Axel Schambach
Basic mechanisms of inflammation 2 Infection & cancer	seminar * **	Tuesday, 28.01.2020	3.00 – 4.30 pm	Ulrich Lehmann-Mühlenhoff
	tutorial * **	Tuesday, 28.01.2020	4.45 – 5.45 pm	Ulrich Lehmann-Mühlenhoff
Synthetic biology and options for regeneration	seminar	Thursday, 30.01.2020	4.15 – 5.45 pm	Dagmar Wirth
	tutorial	Thursday, 06.02.2020	3.00 – 4.00 pm	Dagmar Wirth
Principles of cell engineering 3 - Cell expansion Bioreactors	seminar	Thursday, 06.02.2020	4.15 – 5.15 pm	Thomas Scheper
	tutorial**	Thursday, 13.02.2020	4.30 – 6.00 pm	Thomas Scheper / Frank Stahl

Please note the following changes:

* The seminars on 28th November 2019 and 28th January 2020 will be immediately followed by the associated tutorial.

** The seminars on 7th and 28th January 2020 will take place at the building I/J 11, Hans-Borst-Zentrum (HBZ), level S0, seminar room 6040.

The tutorial (Thomas Scheper) on Thursday, 13th February 2019 will NOT take place at MHH but at the Institute of Technical Chemistry

Leibniz Universität Hannover (LUH)

Callinstr. 3

30167 Hannover

Callinstr. 3 (LUH) can easily be reached by tram no. 4 directly from MHH to stop Schneiderberg/Wilhelm-Busch-Museum (20 minutes tram)

2 nd semester				
Principles of materials sciences for regenerative medicine 1 - Nanoparticles in medicine (seminar) - Nanomanufacturing (tutorial)	seminar * **	Thursday, 16.04.2020	3.00 – 4.00 pm	Annette Barchanski
	tutorial * **	Thursday, 16.04.2020	4.15 – 5.45 pm	Annette Barchanski
Principles of materials sciences for regenerative medicine 2 Introduction to biomaterials - Ceramic materials (seminar) - Chemistry (tutorial)	seminar * **	Thursday, 23.04.2020	3.00 - 4.30 pm	Peter Behrens
	tutorial * **	Thursday, 23.04.2020	4.45 – 5.45 pm	Peter Behrens
Principles of materials sciences for regenerative medicine 3 - Polymeric and metallic materials (seminar) - Cell-biomaterial interactions (seminar) - Scaffold technologies (tutorial)	seminar **	Thursday, 30.04.2020	4.15 – 5.45 pm	Birgit Glasmacher
	tutorial **	Thursday, 07.05.2020	3.00 – 4.00 pm	Birgit Glasmacher
Principles of growth factor engineering Engineering growth factors and their receptors for regenerative medicine	seminar*	Thursday, 14.05.2020	3.00 - 4.30 pm	Michael Morgan
	tutorial*	Thursday, 14.05.2020	4.45 – 5.45 pm	Michael Morgan
Laser technology in medicine 1 Imaging - Basics of microscopy - Contrast mechanisms - Modern approaches in imaging - Superresolution microscopy	seminar * **	Tuesday, 19.05.2020	3.00 – 4.30 pm	Alexander Heisterkamp
	tutorial * **	Tuesday, 19.05.2020	4.45 – 5.45 pm	Alexander Heisterkamp
Laser technology in medicine 2 Laser manipulation/machining - Surface treatment, structuring, polymerization - Laser-tissue interaction - Laser manipulation of cells	seminar * **	Thursday, 28.05.2020	3.00 – 4.00 pm	Boris Chichkov
	tutorial * **	Thursday, 28.05.2020	4.15 – 5.45 pm	Boris Chichkov
Animal models of human disease 1 Murine models of human disease	seminar*	Thursday, 04.06.2020	3.00 – 4.00 pm	Achim Gossler
	tutorial*	Thursday, 04.06.2020	4.15 – 5.45 pm	Achim Gossler
Principles of organ transplantation 1 Heart, lung, and vessels	seminar*	Thursday, 11.06.2020	3.00 – 4.30 pm	Axel Haverich <i>et al.</i>
	tutorial*	Thursday, 11.06.2020	4.45 – 5.45 pm	Axel Haverich <i>et al.</i>

Animal models of human disease 2 - Primate models - Humanized mouse models	seminar*	Thursday, 18.06.2020	3.00 – 4.30 pm	Thomas Moritz
	tutorial*	Thursday, 18.06.2020	4.45 – 5.45 pm	Thomas Moritz
Animal models of human disease 3 - Transgenic pigs - Xenotransplantation - Donor animal engineering	seminar*	Thursday, 25.06.2020	3.00 – 4.30 pm	Heiner Niemann
	tutorial*	Thursday, 25.06.2020	4.45 – 5.45 pm	Heiner Niemann
Cardiovascular tissue engineering: Principles	seminar	Thursday, 02.07.2020	4.15 – 5.45 pm	Andres Hilfiker
	tutorial	Thursday, 09.07.2020	3.00 – 4.00 pm	Andres Hilfiker
Principles of organ transplantation 2 Liver, pancreas, and β -cells	seminar	Thursday, 09.07.2020	4.15 – 5.45 pm	Michael Ott
	tutorial	Thursday, 16.07.2020	3.00 – 4.00 pm	Michael Ott
Stem cell based organ regeneration - Heart and β -cells - clinical translation	seminar	Thursday, 16.07.2020	4.15 – 5.45 pm	Robert Zweigerdt
	tutorial	Thursday, 23.07.2020	3.00 – 4.00 pm	Robert Zweigerdt

Please note the following changes

* The seminars on 16th and 23th April, 14th, 19th and 28th May 2020 and 4th, 11th, 18th and 25th June 2020 will be immediately followed by the associated tutorial.

**The seminars and tutorials on 16th, 23th and 30th April 2020 and 7th, 19th, 28th May 2020 will NOT take place at MHH, please find the respective addresses below.

Additional information on „Principles of materials sciences for regenerative medicine“, part 1, 2 and 3

General topics:

- materials engineering, biomaterials in medicine,
- *ex vivo* and *in vivo* application,
- degradable materials,
- cell-biomaterial interactions

Literature: Biomaterials Science (Third Edition), BD Ratner, AS Hoffman, FJ Schoen, JE Lemons (eds.) Elsevier Amsterdam 2013; available online, MHH library

Lecturers and locations of lectures and tutorials:

16.04.2020 Dr. Annette Barchanski

NIFE - Lower Saxony Centre for Biomedical Engineering, Implant Research and Development
Stadtfelddamm 34
30625 Hannover

23.04.2020 Prof. Dr. Peter Behrens

Leibniz Universität Hannover (LUH)
Institute of Inorganic Chemistry
Callinstrasse 9, 30167 Hannover

30.04. and 07.05.2020 Prof. Dr. Birgit Glasmacher

NIFE - Lower Saxony Centre for Biomedical Engineering, Implant Research and Development
Stadtfelddamm 34
30625 Hannover

19.05.2020 Prof. Dr. Alexander Heisterkamp

NIFE - Lower Saxony Centre for Biomedical Engineering, Implant Research and Development
Level S0, big seminar room
Stadtfelddamm 34
30625 Hannover

28.05.2020 Prof. Dr. Boris Chichkov

NIFE - Lower Saxony Centre for Biomedical Engineering, Implant Research and Development
Stadtfelddamm 34
30625 Hannover

3rd semester				
Regenerative approaches: Blood and immunity 1 - Thymus and T-cell development - B-cell development - Flow cytometry	seminar	Thursday, 17.10.2019	4.15 – 5.45 pm	Siegfried Weiß
	tutorial	Thursday, 24.10.2019	3.00 – 4.00 pm	Christine Falk
Regenerative approaches: Blood and immunity 2 Embryonic stem cell derived hematopoiesis	seminar * **	Tuesday, 05.11.2019	3.00 – 4.30 pm	Nico Lachmann
	tutorial * **	Tuesday, 05.11.2019	4.45 – 5.45 pm	Nico Lachmann
Regenerative approaches: Blood and immunity 3 - Principles of hematopoietic stem cell transplantation and lymphocyte infusions - HLA system and HLA compatibility (tutorial)	seminar*	Thursday, 07.11.2019	3.00 – 4.30 pm	Matthias Eder
	tutorial*	Thursday, 07.11.2019	4.45 – 5.45 pm	Constanca Figueiredo
Regenerative approaches: Liver 1 - Physiology and pathophysiological changes of the liver - Liver cell therapy, basics in translation	seminar	Thursday, 28.11.2019	4.15 – 5.45 pm	Michael Ott
	tutorial	Thursday, 05.12.2019	3.00 – 4.00 pm	Michael Ott
Regenerative approaches: Liver 2 - Liver regeneration and stem cells - Stem cell-derived hepatocytes	seminar	Thursday, 05.12.2019	4.15 – 5.45 pm	Tobias Cantz/Reto Eggenschwiler
	tutorial	Thursday, 12.12.2019	3.00 – 4.00 pm	Tobias Cantz/Reto Eggenschwiler
Regenerative approaches: Blood and immunity 4 - Genetic disorders of hematopoiesis - Leukemia and leukemogenic stem cells	seminar	Tuesday, 10.12.2019	3.00 – 4.30 pm	Axel Schambach
	tutorial	Tuesday, 17.12.2019	3.00 - 4.00 pm	Axel Schambach
Regenerative approaches: Liver 3 - Liver tissue engineering - Artificial liver / extracorporeal devices	seminar	Thursday, 12.12.2019	4.15 – 5.45 pm	Tobias Cantz/Reto Eggenschwiler
	tutorial	Thursday, 19.12.2019	3.00 – 4.00 pm	Tobias Cantz/Reto Eggenschwiler
Non-coding RNAs in cardiovascular disease - Regeneration and therapeutic approaches	seminar	Tuesday, 07.01.2020	4.15 – 5.45 pm	Christian Bär
	tutorial	Thursday, 09.01.2020	3.00 – 4.00 pm	Jan Fiedler
Genome Engineering and AAV	seminar	Thursday, 09.01.2020	4.15 – 5.45 pm	Hildegard Büning
	tutorial	Thursday, 23.01.2020	3.00 – 4.00 pm	Hildegard Büning

Genotoxicity and monitoring	seminar*	Thursday, 16.01.2020	3.00 – 4.30 pm	Michael Rothe
	tutorial*	Thursday, 16.01.2020	4.45 – 5.45 pm	Michael Rothe
Immunotoxicity and immunomonitoring	seminar	Thursday, 23.01.2020	4.15 – 5.45 pm	Christine Falk
	tutorial	Thursday, 30.01.2020	3.00 – 4.00 pm	Christine Falk
Animal experiments - Introduction to animal experiments - Presentation of the animal house	seminar*	Thursday, 06.02.2020	3.00 – 4.30 pm	André Bleich
	tutorial*	Thursday, 06.02.2020	4.45 – 5.45 pm	André Bleich
Measuring through the microscope - Quantitative structural assessment of organs, tissues and cells - Pitfalls of microscopic morphometry and basic concepts of design-based stereology (seminar) - Applications of stereology to the heart and the lung (tutorial)	seminar*	Monday, 10.02.2020	3.00 – 4.30 pm	Christian Mühlfeld
	tutorial*	Monday, 10.02.2020	4.45 – 5.45 pm	Christian Mühlfeld
Molecular Imaging of Regenerative Medicine (seminar) Tour of the Department of Nuclear Medicine (tutorial)	seminar	Thursday, 13.02.2020	4.15 – 5.45 pm	James Thackeray
	tutorial	Thursday, 20.02.2020	3.00 – 4.00 pm	James Thackeray
Design of clinical trials & regulation	seminar	Tuesday, 25.02.2020	3.00 – 4.30 pm	Heiko von der Leyen
Cell sorting - Method based seminar - Visit to MHH sorter lab → instrumentation (tutorial)	seminar	Thursday, 20.02.2020	4.15 – 5.45 pm	Matthias Ballmaier
	tutorial	Thursday, 27.02.2020	3.00 – 4.00 pm	Matthias Ballmaier
Regenerative approaches: Blood and immunity 5 - Antigen presenting cells	seminar	Thursday, 27.02.2020	4.15 – 5.45 pm	Renata Stripecke
	tutorial	Thursday, 05.03.2020	3.00 – 4.00 pm	Renata Stripecke

Please note the following change

* The seminars on 5th and 7th November 2019 and 16th January 2020 and 6th and 10th February 2020 will be immediately followed by the associated tutorial.

** The seminar and tutorial by Nico Lachman on Tuesday 5th of November 2019 will take place at Seminarraum 70 (I6-S0-3020), I06 Theoretische Institute II

4 th semester				
Regenerative approaches: Heart and vessels 1 - Basics in Cardiology - Protein therapeutics for cardiovascular repair (tutorial)	seminar	Tuesday, 21.04.2020	4.15 – 5.45 pm	Kai Wollert
	tutorial	Thursday, 23.04.2020	3.00 – 4.00 pm	Marc Reboll
Regenerative Approaches: Heart and vessels 2 - Pathogenesis and regeneration of the heart in response to cancer und anti-cancer treatment	seminar	Tuesday, 28.04.2020	4.15 – 5.45 pm	Denise Hilfiker-Kleiner
	tutorial	Thursday, 30.04.2020	3.00 – 4.00 pm	Denise Hilfiker-Kleiner
Regenerative approaches: Heart and vessels 3 - Angiogenesis und arteriogenesis in development and disease	seminar	Thursday, 30.04.2020	4.15 – 5.45 pm	Florian Limbourg
	tutorial	Thursday, 07.05.2020	3.00 – 4.00 pm	Florian Limbourg
Regenerative approaches: Heart and vessels 4 - Cardiac differentiation of pluripotent stem cells & myocardial TE	seminar	Thursday, 07.05.2020	4.15 – 5.45 pm	Ina Gruh
	tutorial	Thursday, 14.05.2020	3.00 – 4.00 pm	Ina Gruh
Regenerative approaches: Lung 1	seminar	Thursday, 14.05.2020	4.15 – 5.45 pm	Ruth Olmer
	tutorial	Thursday, 28.05.2020	3.00 – 4.00 pm	Ruth Olmer
Regenerative approaches: Lung 2	seminar	Thursday, 28.05.2020	4.15 – 5.45 pm	Ruth Olmer
	tutorial	Thursday, 04.06.2020	3.00 – 4.00 pm	Ruth Olmer
The Axolotl – an Amphibian Model Organism of Regeneration	seminar * **	Thursday, 18.06.2020	3.00 – 4.30 pm	Sarah Strauß
	tutorial * **	Thursday, 18.06.2020	4.45. – 5.45 pm	Sarah Strauß
Possibilities and limits of adult mesenchymal stem cells within the context of Tissue Engineering	seminar	Thursday, 25.06.2020	4.15 – 5.45 pm	Cornelia Blume
	tutorial	Thursday, 02.07.2020	3.00 – 4.00 pm	Cornelia Blume / Rebecca Jonczyk
Regenerative Approaches: Nerve - Degeneration and regeneration in the central and peripheral nervous system - Animal models of acute and chronic neurotoxicity - Cell therapy in the nervous system: neuronal and non-neuronal cells - Application modes - Clinical trials	seminar	Thursday, 02.07.2020	4.15 – 5.45 pm	Susanne Petri
	tutorial	Thursday, 09.07.2020	3.00 – 4.00 pm	Susanne Petri

Patent protection of academic inventions	seminar	Thursday, 09.07.2020	4.15 – 5.45 pm	Torben Söker Ascenion GmbH
	tutorial	Thursday, 16.07.2020	3.00 – 4.00 pm	Torben Söker Ascenion GmbH
Good Manufacturing Practice (GMP), Advanced Therapy Medicinal Products (ATMP)	seminar * **	Tuesday, 14.07.2020	3.00 – 4.30 pm	Ulrike Köhl / Stephan Klöss
	tutorial * **	Tuesday, 14.07.2020	4.45. – 5.45 pm	Ulrike Köhl / Stephan Klöss
Quality Management - QM	seminar	Thursday, 23.07.2020	3.00 – 4.30 pm	Christoph Priesner
	tutorial**	Thursday, 30.07.2020	4.45. – 5.45 pm	Christoph Priesner

Please note the following change

* The seminars on 18th June 2020 and 14th July 2020 will be immediately followed by the associated tutorial.

** The seminars and tutorials on 18th June and 14th July 2020 will NOT take place at the MHH, please find the respective addresses below:

18.06.2020 Dr. rer. nat. Sarah Strauß

Ambystoma Mexicanum Bioregeneration Center & Spider Silk Laboratory
Feodor-Lynen Str. 21, 30625 Hannover
Building M05 level S0 seminar room 0110

14.07.2020 Prof. Dr. Ulrike Köhl und Dr. Stephan Klöss

ATMP-GMP-DU
Building 05, level 4
Feodor-Lynen-Straße 21, 30625 Hannover
Seminar level 3 and the tutorial on level 1

30.07.2020 Christoph Priesner

only tutorial

M05-E04
Feodor-Lynen-Str. 21, 30625 Hannover

Additional offers:

Title	Name	Department	Location	Date	Time
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Meet The Expert

From bedside to the lab-side: friends and foes of industrial high throughput qPCR molecular diagnostics	Thomas Müller	Molecular Biology, Synlab Medical Care Unit Weiden	HBZ seminar room	29.11.2019	10.30 - 12.00 am
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Method Based Seminar

Novel trends in cryopreservation of tissues and cryomicroscopy	Oleksandr Gryshkov	Institute of Multiphase Processes, LUH	NIFE	07.05.2020	4.00 – 5.30 pm
Telomeres & Telomerase: from measurement to manipulation of longevity	Christian Bär	Institute of Molecular and Translational Therapeutic Strategies (IMTTS), MHH	HBZ Seminar room (J11-S0-6040)	29.01.2020	4.00 – 5.30 pm
Laser based methods for imaging and manipulation of cells and tissue	Stefan Kalies	Institute for Quantum Optics, LUH	NIFE – Lower Saxony Centre for Biomedical Engineering, Implant Research and Development	May 2020 (tbd)	tbd

Date and time for all semesters on appointment (registration required).