

## PhD Program “Regenerative Sciences”

### Times:

Tutorials: Thursdays, 3.00 – 4.00 pm

Seminars: Thursdays, 4.15 – 5.45 pm

### Locations:

Semester 1 & 2 MHH, building J04, level 01, HBRS seminar room 1140

Semester 3 & 4 MHH, building J11, Hans-Borst-Zentrum (HBZ), level S0, seminar room 6040

### Other Locations\*:

#### NIFE\*:

Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung - NIFE  
(Lower Saxony Centre for Biomedical Engineering, Implant Research and Development)  
Stadtfelddamm 34  
30625 Hannover

#### LUH\*:

Prof. Dr. Peter Behrens (Seminar & tutorial: 15.04.2021, 2<sup>nd</sup> semester)  
Leibniz Universität Hannover (LUH)  
Institute of Inorganic Chemistry  
Callinstrasse 9, 30167 Hannover

#### Feodor-Lynen Str. 21\*:

Dr. Sarah Strauß (Seminar & tutorial: 03.06.2021, 4<sup>th</sup> semester)  
Ambystoma Mexicanum Bioregeneration Center & Spider Silk Laboratory  
Feodor-Lynen Str. 21, 30625 Hannover  
Building M05 level S0 seminar room 0110

Dr. Stephan Klöß (Seminar & tutorial: 01.07.2021, 4<sup>th</sup> semester)  
ATMP-GMP-DU  
Building 05, level 4  
Feodor-Lynen-Straße 21, 30625 Hannover  
Seminar: Building 05, level 3  
Tutorial: Building 05, level 1

**Please note: No seminars and tutorials on Thursday, May 13<sup>th</sup>, 2021 (Public holiday: Ascension Day “Christi Himmelfahrt”).**

<b>1<sup>st</sup> semester</b>				
<b>Introductory lecture</b> - Welcoming speech - The curriculum of RegSci & HBRS - Q & A - Principles of regenerative sciences and the REBIRTH approach	seminar	08.10.2020	4.15 – 5.15 pm	Ulrich Martin
<b>Principles of growth factor signaling 1</b> - Paracrine and juxtacrine signaling - Signalling pathways involved in the regulation of growth	seminar	15.10.2020	4.15 – 5.45 pm	Rainer Niedenthal
	tutorial	22.10.2020	3.00 – 4.00 pm	
<b>Principles of growth factor signaling 2</b> - Cytokines, hormones, and their receptors	seminar	22.10.2020	4.15 – 5.45 pm	Michael Morgan
	tutorial	29.10.2020	3.00 – 4.00 pm	
<b>Basic mechanisms of inflammation 1</b> - Innate and adaptive immunity and differentiation	seminar	29.10.2020	4.15 – 5.45 pm	Siegfried Weiß
	tutorial	05.11.2020	3.00 – 4.00 pm	
<b>Principles of developmental biology and organogenesis 1</b> - Commitment, differentiation, apoptosis, patterning - Morphogenetic gradients and cell-cell communication - Genetic and epigenetic mechanisms	seminar	05.11.2020	4.15 – 5.45 pm	Andreas Kispert
	tutorial	12.11.2020	3.00 – 4.00 pm	
<b>Principles of developmental biology and organogenesis 2</b> - Model systems in developmental Biology - Embryogenesis and fetal development	seminar	12.11.2020	4.15 – 5.45 pm	Achim Gossler
	tutorial	19.11.2020	3.00 – 4.00 pm	
<b>Principles of stem cell biology 1</b> - Embryonic derivation of stem cells - Culture methods	seminar & tutorial	26.11.2020	3.00 – 4.30 pm	Thomas Müller
			4.45 – 5.45 pm	
<b>Principles of stem cell biology 2</b> - Tumor stem cells and mechanisms of transformation - Principles of cell cycle regulation	seminar	03.12.2020	4.15 – 5.45 pm	Amar Deep Sharma
	tutorial	10.12.2020	3.00 – 4.00 pm	
<b>Principles of chromosomal instability</b>	seminar	10.12.2020	4.15 – 5.45 pm	Gudrun Göhring
	tutorial	17.12.2020	3.00 – 4.00 pm	
<b>Principles of cell engineering 3</b> - Cell expansion Bioreactors	seminar	07.01.2021	4.15 – 5.45 pm	Robert Zweigerdt
	tutorial	14.01.2021	3.00 – 4.00 pm	

<b>Cellular senescence, tumor suppression and organismal aging</b>	seminar	14.01.2021	4.15 – 5.45 pm	Anette Melk
	tutorial	21.01.2021	3.00 – 4.00 pm	
<b>Principles of cell engineering 2</b> - Transient DNA delivery - Episomal maintenance - Stable DNA delivery - Homologous recombination - Site-specific DNA modification	seminar	21.01.2021	4.15 – 5.45 pm	Axel Schambach
	tutorial	28.01.2021	3.00 – 4.00 pm	
<b>Basic mechanisms of inflammation 2</b> - Infection & cancer	seminar & tutorial	04.02.2021	3.00 – 4.30 pm	Ulrich Lehmann-Mühlenhoff
			4.45 – 5.45 pm	
<b>Synthetic biology and options for regeneration</b>	seminar	11.02.2021	4.15 – 5.45 pm	Dagmar Wirth
	tutorial	18.02.2021	3.00 – 4.00 pm	
<b>Principles of cell engineering 1</b> - MicroRNAs (miRNA) and downstream targets - Technical approaches - Use of miRNA target identification software - Design of miRNA - Luciferase-gene reporter assays (tutorial)	seminar	18.02.2021	4.15 – 5.45 pm	Thomas Thum
	tutorial	25.02.2021	3.00 – 4.00 pm	Jan Fiedler

2 <sup>nd</sup> semester				
<b>Principles of materials sciences for regenerative medicine 1*</b> - Nanoparticles in medicine (seminar) - Nanomanufacturing (tutorial)	seminar & tutorial	08.04.2021	3.00 – 4.30 pm <b>NIFE*</b>	Annette Hoffmeister
			4.45 – 5.45 pm <b>NIFE*</b>	
<b>Principles of materials sciences for regenerative medicine 2*</b> Introduction to biomaterials - Ceramic materials (seminar) - Chemistry (tutorial)	seminar & tutorial	15.04.2021	3.00 - 4.30 pm <b>LUH, Callinstr. 9*</b>	Peter Behrens
			4.45 – 5.45 pm <b>LUH, Callinstr. 9*</b>	
<b>Principles of materials sciences for regenerative medicine 3*</b> - Polymeric and metallic materials (seminar) - Cell-biomaterial interactions (seminar) - Scaffold technologies (tutorial)	seminar	22.04.2021	4.15 – 5.45 pm <b>NIFE*</b>	Birgit Glasmacher
	tutorial	29.04.2021	3.00 – 4.00 pm <b>NIFE*</b>	Oleksandr Gryshkov
<b>Principles of growth factor engineering</b> - Engineering growth factors and their receptors for regenerative medicine	seminar & tutorial	06.05.2021	3.00 - 4.30 pm	Michael Morgan
			4.45 – 5.45 pm	
<b>Laser technology in medicine 1 - Imaging</b> - Basics of microscopy - Contrast mechanisms - Modern approaches in imaging - Superresolution microscopy	seminar & tutorial	20.05.2021	3.00 – 4.30 pm <b>NIFE*</b>	Alexander Heisterkamp
			4.45 – 5.45 pm <b>NIFE*</b>	
<b>Laser technology in medicine 2 - Laser manipulation/machining</b> - Surface treatment, structuring, polymerization - Laser-tissue interaction - Laser manipulation of cells	seminar & tutorial	27.05.2021	3.00 – 4.30 pm <b>NIFE*</b>	Boris Chichkov
			4.45 – 5.45 pm <b>NIFE*</b>	
<b>Animal models of human disease 1</b> - Murine models of human disease	seminar & tutorial	03.06.2021	3.00 – 4.30 pm	Achim Gossler
			4.45 – 5.45 pm	
<b>Principles of organ transplantation 1</b> - Heart, lung, and vessels	seminar & tutorial	10.06.2021	3.00 – 4.30 pm	Jawad Salman
			4.45 – 5.45 pm	
<b>Cardiovascular tissue engineering: Principles</b>	seminar	17.06.2021	4.15 – 5.45 pm	Andres Hilfiker
	tutorial	24.06.2021	3.00 – 4.00 pm	
<b>Animal models of human disease 3</b> - Transgenic pigs - Xenotransplantation - Donor animal engineering	seminar	24.06.2021	4.15 – 5.45 pm	Heiner Niemann
	tutorial	01.07.2021	3.00 – 4.00 pm	
<b>Animal models of human disease 2</b> - Primate models - Humanized mouse models	seminar	01.07.2021	4.15 – 5.45 pm	Thomas Moritz
	tutorial	08.07.2021	3.00 – 4.00 pm	

<b>Principles of organ transplantation 2</b> - Liver, pancreas, and $\beta$ -cells	seminar	08.07.2021	4.15 – 5.45 pm	Michael Ott
	tutorial	15.07.2021	3.00 – 4.00 pm	
<b>Stem cell based organ regeneration</b> - Heart and $\beta$ -cells - Clinical translation	seminar	15.07.2021	4.15 – 5.45 pm	Robert Zweigerdt
	tutorial	22.07.2021	3.00 – 4.00 pm	

♦ *Literature for „Principles of materials sciences for regenerative medicine“, part 1, 2, and 3:*  
Biomaterials Science (Third Edition), BD Ratner, AS Hoffman, FJ Schoen, JE Lemons (eds.) Elsevier, Amsterdam 2013; available online, MHH library

**Other Locations\*:**

**NIFE\*:**

Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung - NIFE  
(Lower Saxony Centre for Biomedical Engineering, Implant Research and Development)  
Stadtfelddamm 34  
30625 Hannover

**LUH, Callinstr. 9\*:**

Prof. Dr. Peter Behrens (Seminar & tutorial: 15.04.2021)  
Leibniz Universität Hannover (LUH)  
Institute of Inorganic Chemistry  
Callinstrasse 9, 30167 Hannover

3 <sup>rd</sup> semester				
<b>Regenerative approaches: Blood and immunity 1</b> - Thymus and T-cell development - B-cell development - Flow cytometry	seminar	15.10.2020	4.15 – 5.45 pm	Siegfried Weiß
	tutorial	22.10.2020	3.00 – 4.00 pm	Christine Falk
<b>Regenerative approaches: Blood and immunity 2</b> - Embryonic stem cell derived hematopoiesis	seminar & tutorial	05.11.2020	3.00 – 4.30 pm	Nico Lachmann
			4.45 – 5.45 pm	
<b>Regenerative approaches: Blood and immunity 3</b> - Principles of hematopoietic stem cell transplantation and lymphocyte infusions HLA system and HLA compatibility (tutorial)	seminar	12.11.2020	4.15 – 5.45 pm	Matthias Eder
	tutorial	19.11.2020	3.00 – 4.00 pm	Constanca Figueiredo
<b>Regenerative approaches: Liver 1</b> - Physiology and pathophysiological changes of the liver - Liver cell therapy, basics in translation	seminar	19.11.2020	4.15 – 5.45 pm	Michael Ott
	tutorial	26.11.2020	3.00 – 4.00 pm	
<b>Regenerative approaches: Liver 2</b> - Liver regeneration and stem cells Stem cell-derived hepatocytes	seminar	26.11.2020	4.15 – 5.45 pm	Tobias Cantz
	tutorial	03.12.2020	3.00 – 4.00 pm	Tobias Cantz / Reto Eggenschwiler
<b>Regenerative approaches: Blood and immunity 4</b> - Genetic disorders of hematopoiesis, Leukemia, and leukemogenic stem cells	seminar	03.12.2020	4.15 – 5.45 pm	Axel Schambach
	tutorial	10.12.2020	3.00 – 4.00 pm	
<b>Non-coding RNAs in cardiovascular disease</b> - Regeneration and therapeutic approaches	seminar	10.12.2020	4.15 – 5.45 pm	Christian Bär
	tutorial	17.12.2020	3.00 – 4.00 pm	Jan Fiedler
<b>Regenerative approaches: Liver 3</b> - Liver tissue engineering - Artificial liver / extracorporeal devices	seminar	17.12.2020	4.15 – 5.45 pm	Tobias Cantz
	tutorial	07.01.2021	3.00 – 4.00 pm	Tobias Cantz / Reto Eggenschwiler
<b>AAV capsid engineering for in vivo gene therapy</b>	seminar	07.01.2021	4.15 – 5.45 pm	Hildegard Büning
	tutorial	14.01.2021	3.00 – 4.00 pm	
<b>Immunotoxicity &amp; immunomonitoring</b>	seminar	21.01.2021	4.15 – 5.45 pm	Christine Falk
	tutorial	28.01.2021	3.00 – 4.00 pm	
<b>Genotoxicity &amp; monitoring</b>	seminar & tutorial	04.02.2021	3.00 – 4.30 pm	Michael Rothe
			4.45 – 5.45 pm	

<b>Animal experiments</b> - Introduction to animal experiments - Presentation of the animal house	seminar & tutorial	11.02.2021	3.00 – 4.30 pm	André Bleich
			4.45 – 5.45 pm	
<b>Measuring through the microscope - Quantitative structural assessment of organs, tissues and cells</b> - Pitfalls of microscopic morphometry and basic concepts of design-based stereology (seminar) - Applications of stereology to the heart and the lung (tutorial)	seminar & tutorial	18.02.2021	3.00 – 4.30 pm	Christian Mühlfeld
			4.45 – 5.45 pm	
<b>Molecular Imaging of Regenerative Medicine</b> - Molecular Imaging (seminar) - Tour of the Department of Nuclear Medicine (tutorial)	seminar	25.02.2021	4.15 – 5.45 pm	James Thackeray
	tutorial	04.03.2021	3.00 – 4.00 pm	
<b>Cell sorting</b> - Method based seminar - Visit to MHH sorter lab → instrumentation (tutorial)	seminar	04.03.2021	4.15 – 5.45 pm	Matthias Ballmaier
	tutorial	11.03.2021	3.00 – 4.00 pm	
<b>Regenerative approaches: Blood and immunity 5</b> - Antigen presenting cells	seminar	11.03.2021	4.15 – 5.45 pm	Renata Stripecke
	tutorial	18.03.2021	3.00 – 4.00 pm	
<b>Design of clinical trials &amp; regulation</b>	seminar	18.03.2021	4.15 – 5.45 pm	Heiko von der Leyen

4 <sup>th</sup> semester				
<b>Regenerative approaches: Heart and vessels 1</b> - Basics in Cardiology - Protein therapeutics for cardiovascular repair (tutorial)	seminar	<b>TUESDAY 13.4.2021</b>	4.15 – 5.45 pm	Kai Wollert
	tutorial	15.04.2021	3.00 – 4.00 pm	Marc Reboll
<b>Regenerative Approaches: Heart and vessels 2</b> - Pathogenesis and regeneration of the heart in response to cancer und anti-cancer treatment	seminar	15.04.2021	4.15 – 5.45 pm	Denise Hilfiker-Kleiner
	tutorial	22.04.2021	3.00 – 4.00 pm	
<b>Regenerative approaches: Heart and vessels 3</b> - Angiogenesis and arteriogenesis in development and disease	seminar	22.04.2021	4.15 – 5.45 pm	Florian Limbourg
	tutorial	29.04.2021	3.00 – 4.00 pm	
<b>Regenerative approaches: Heart and vessels 4</b> - Cardiac differentiation of pluripotent stem cells & myocardial TE	seminar	29.04.2021	4.15 – 5.45 pm	Ina Gruh
	tutorial	06.05.2021	3.00 – 4.00 pm	
<b>Regenerative approaches: Lung 1</b>	seminar	06.05.2021	4.15 – 5.45 pm	Ruth Olmer
	tutorial	20.05.2021	3.00 – 4.00 pm	
<b>Regenerative approaches: Lung 2</b>	seminar	20.05.2021	4.15 – 5.45 pm	
	tutorial	27.05.2021	3.00 – 4.00 pm	
<b>The Axolotl – an Amphibian Model Organism of Regeneration</b>	seminar & tutorial	03.06.2021	3.00 – 4.30 pm <b>Feodor-Lynen-Str. 21*</b>	Sarah Strauß
			4.45. – 5.45 pm <b>Feodor-Lynen-Str. 21*</b>	
<b>Possibilities and limits of adult mesenchymal stem cells within the context of Tissue Engineering</b>	seminar	27.05.2021	4.15 – 5.45 pm	Cornelia Blume
	tutorial	10.06.2021	3.00 – 4.00 pm	
<b>Regenerative Approaches: Nerve</b> - 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	10.06.2021	4.15 – 5.45 pm	Susanne Petri
	tutorial	17.06.2021	3.00 – 4.00 pm	
<b>Patent protection of academic inventions</b>	seminar	17.06.2021	4.15 – 5.45 pm	Torben Söker, Ascenion GmbH
	tutorial	24.06.2021	3.00 – 4.00 pm	



<b>Good Manufacturing Practice (GMP), Advanced Therapy Medicinal Products (ATMP)</b>	seminar & tutorial	01.07.2021	3.00 – 4.30 pm <b>Feodor-Lynen-Str. 21*</b>	Stephan Klöß
			4.45. – 5.45 pm <b>Feodor-Lynen-Str. 21*</b>	
<b>Quality Management - QM</b>	seminar & tutorial	08.07.2021	3.00 – 4.30 pm	Inga Bernemann
			4.45 – 5.45 pm	

**Other Locations\*:**

**Feodor-Lynen-Str. 21\*:**

**Dr. Sarah Strauß** (Seminar & tutorial: 03.06.2021)

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

**Dr. Stephan Klöß** (Seminar & tutorial: 01.07.2021)

ATMP-GMP-DU  
Building 05, level 4  
Feodor-Lynen-Straße 21, 30625 Hannover  
Seminar: Building 05, level 3  
Tutorial: Building 05, level 1

**Additional offers:**

Limited number of participants. **Registration required!**

**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	FRIDAY, 27.11.2020	10.30 - 12.00 am
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**Method-based Seminars**

Advances in cryopreservation of native tissues and tissue-engineered constructs	Oleksandr Gryshkov, IMP, LUH	NIFE*	29.04.2021	4.15 – 5.45 pm
Telomeres & Telomerase: from measurement to manipulation of longevity	Christian Bär, IMTTS, MHH	HBZ	WEDNESDAY, 27.01.2021	4.00 – 5.30 pm
Laser based methods for imaging and manipulation of cells and tissue	Stefan Kalies, IQO, LUH	NIFE*	May 2021 tbd	tbd

**Locations:****HBZ:**

Hans-Borst-Zentrum (HBZ), MHH, building J11, level S0, seminar room 6040

**NIFE\*:**

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