

# **Hannover Medical School**

## **Hannover Biomedical Research School**



### **Curriculum**

**MD / PhD Program “Molecular Medicine”**

**PhD Programs “Infection Biology” and “DEWIN”: Dynamics of Host-Pathogen Interactions**

**PhD Program “Regenerative Sciences”**

**PhD Program “Auditory Sciences”**

**PhD Program “Epidemiology”**

**PhD Program BIOMEDAS (Biomedical Data Sciences)**

Winter and Summer Semester 2023 / 2024

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**PhD Program BIOMEDAS (Biomedical Data Sciences)**

Winter and Summer Semester 2023 / 2024

[www.mhh.de/hbrs](http://www.mhh.de/hbrs)

## **Academic Year**

### **Winter Semester 2023 / 2024**

**Start:** October 9<sup>th</sup>, 2023  
(Opening ceremony October, 9<sup>th</sup>)

**End:** March 15<sup>th</sup>, 2024

**MD / PhD “Molecular Medicine” intermediate examination:** from January 15<sup>th</sup> to February 29<sup>th</sup>, 2024 (students organize the date)

**PhD “Infection Biology” / “DEWIN” intermediate examination:** March 12<sup>th</sup>, 2024

**PhD “Regenerative Sciences” intermediate examination:** by March 27<sup>th</sup>, 2024

**PhD “Epidemiology”, PhD “Auditory Sciences” and PhD “BIOMEDAS” intermediate examination:** To be decided on an individual basis, depending also on status of PhD thesis

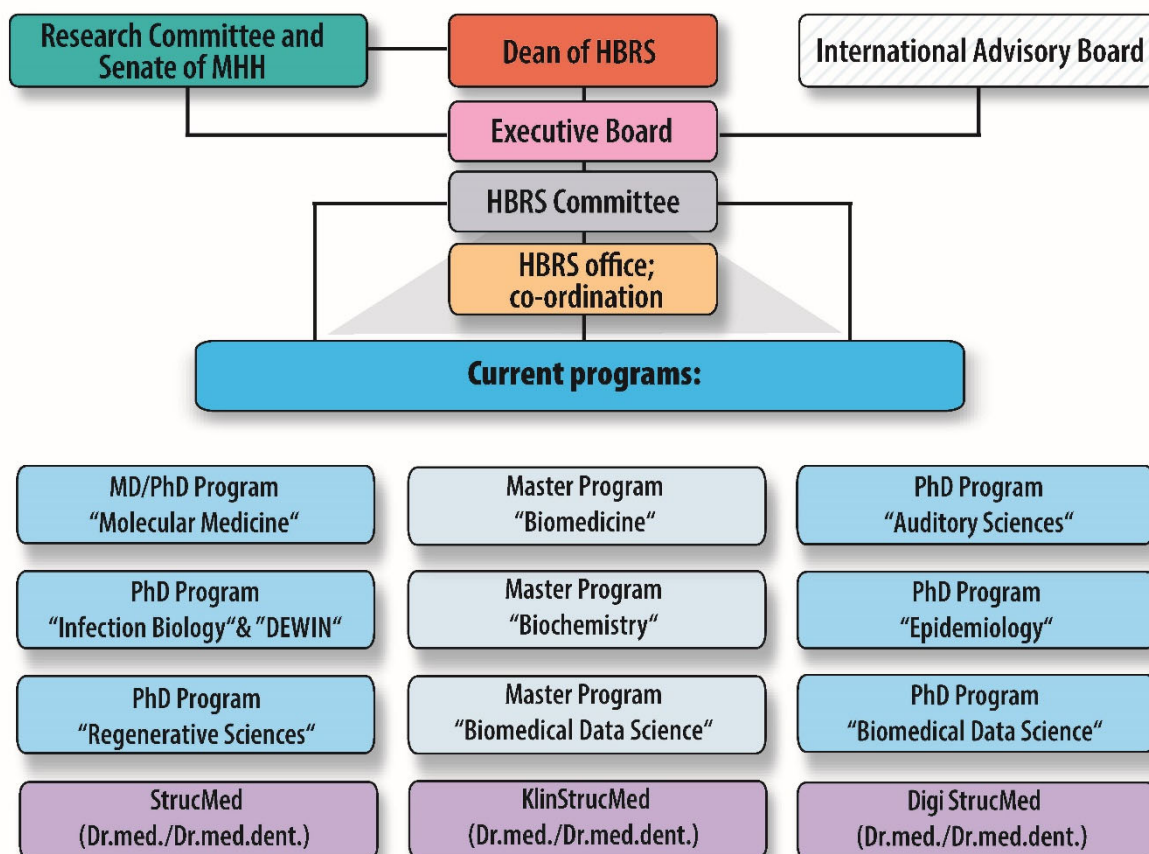
### **Summer Semester 2024**

**Start:** April 8<sup>th</sup>, 2024

**End:** July 19<sup>th</sup>, 2024

## Organisation of Hannover Biomedical Research School

# Hannover Biomedical Research School



### Members of the International Advisory Board:

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Prof. Dr. Marcus Thelen (Università della Svizzera italiana, Bellinzona, Switzerland)

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Maria Jordan / Lea Oehlsen	Shubham Rana/ Friederike Flögel

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Prof. Dr. Tobias Cantz	Dr. Gerald Dräger
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Prof: Dr. Nico Lachmann	Prof. Dr. Cornelia Lee-Thedieck
Prof. Dr. Heiner Niemann	Dr. Ruth Olmer
Prof. Dr. Axel Schambach, PhD	Prof. Dr. Dagmar Wirth

Student members / class representatives:  
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 Nils Kriedemann & Shifaa Abdin (class of 2020);

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Advisory: Dr. V. Hamacher, Head Advanced Bionics GmbH ERC

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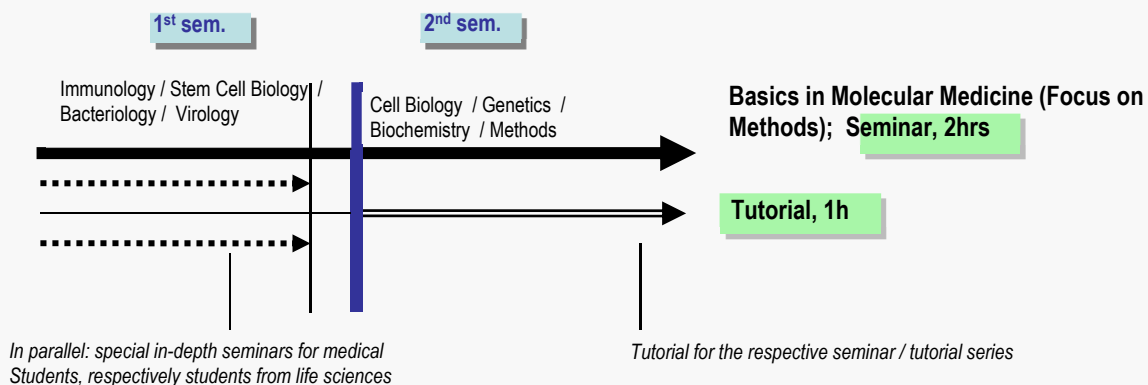


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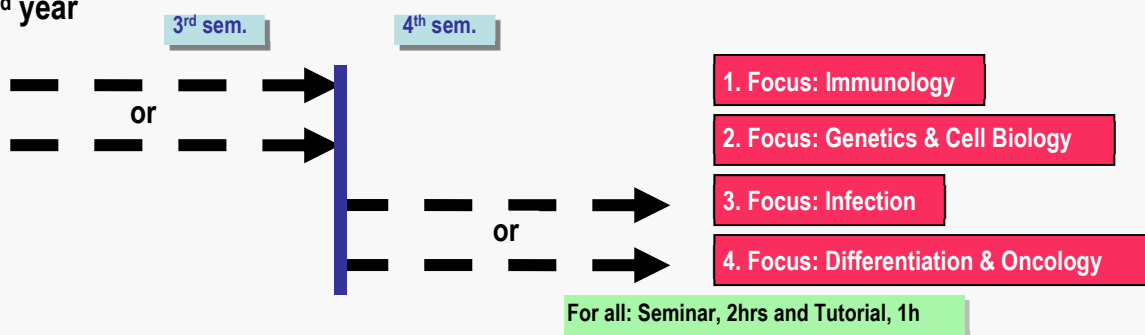
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## Curriculum MD / PhD “Molecular Medicine”

### 1<sup>st</sup> year



### 2<sup>nd</sup> year



3<sup>rd</sup> year: concentration on individual research projects

## Structure of the MD/PhD program „Molecular Medicine“

Year 1	Year 2	Year 3
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- Sem. + Lect. in basic sciences Monday (4.30 - 6.00 pm; 6 cp)
- Tutorials Mondays; until Christmas separate tutorials for medical students and life scientists (3.15- 4.15 pm; 2 cp)

- Complex and clinical system; choice between the foci Immunology, Infection, Oncology and Differentiation, Cell Biology / Genetics, Biochemistry Mondays, Seminar and Tutorial (3.00 - 6.00 pm; 8 cp)

- 3-year PhD project work (125 cp)
- Three presentations in department over three years (10 cp)
- Three presentations of manuscripts at the departments Journal Club over three years (3 cp)
- Public annual presentation / project report (10 cp)
- Talk / presentation at international congress (2 cp)
- Project-orientated seminars / courses; including practicals (80 h, 8 cp)
- Participation in summer schools / interdisciplinary seminars (e. g. soft skills) / congress (60 h, 6 cp)

cp: credit points

Intermediate exam after 18 months

PhD thesis and final exam after 3 years

## Curriculum PhD “Infection Biology” and “DEWIN”

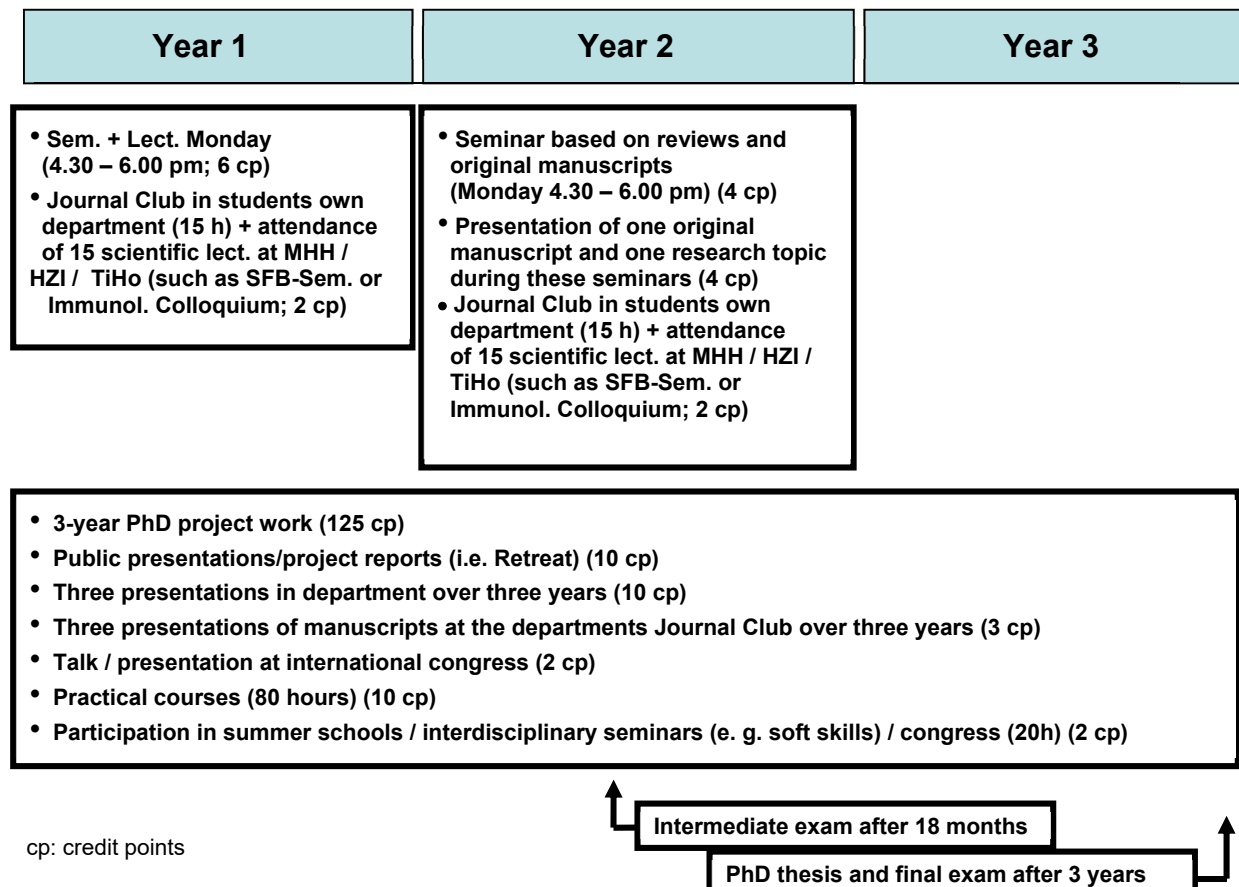
### 1<sup>st</sup> Year

1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester
Weekly seminars: Immunology / Microbiology / Virology / Cell Biology	Project reports & special topic lectures

### 2<sup>nd</sup> Year

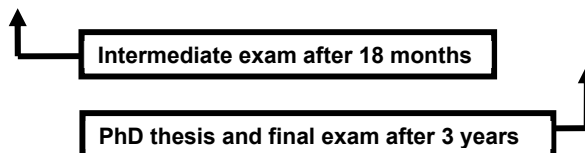
3 <sup>rd</sup> Semester	4 <sup>th</sup> Semester
Presentation of original manuscripts & research topics	Project reports

## Structure of the PhD Program “Infection Biology“ and “DEWIN”



## Structure of the PhD-Program “Regenerative Sciences”

Year 1	Year 2	Year 3
<ul style="list-style-type: none"> <li>• <b>Seminars + Lectures in basic sciences</b> Thursday (4.15 - 5.45 pm)</li> <li>• <b>Tutorials</b> Thursday (3.00- 4.00 pm)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Seminars + Lectures in basic sciences</b> Thursday (4.15 - 5.45 pm)</li> <li>• <b>Tutorials</b> Thursday (3.00 - 4.00 pm)</li> </ul>	<p>Focus on experimental work</p>
<ul style="list-style-type: none"> <li>• <b>3-year PhD project work</b></li> <li>• <b>Three presentations in department within three years (regular attendance)</b></li> <li>• <b>3 Presentations of manuscripts at the department’s Journal Club within three years (regular participation, i. e. 10 times per year)</b></li> <li>• <b>Public annual presentation/project report (i. e. retreat)</b></li> <li>• <b>Talk / presentation at international congress</b></li> <li>• <b>Project-orientated seminars / courses; including practicals and summer schools (80 h)</b></li> <li>• <b>Participation in interdisciplinary seminars (e. g. soft skills / congresses) (40h)</b></li> </ul>		

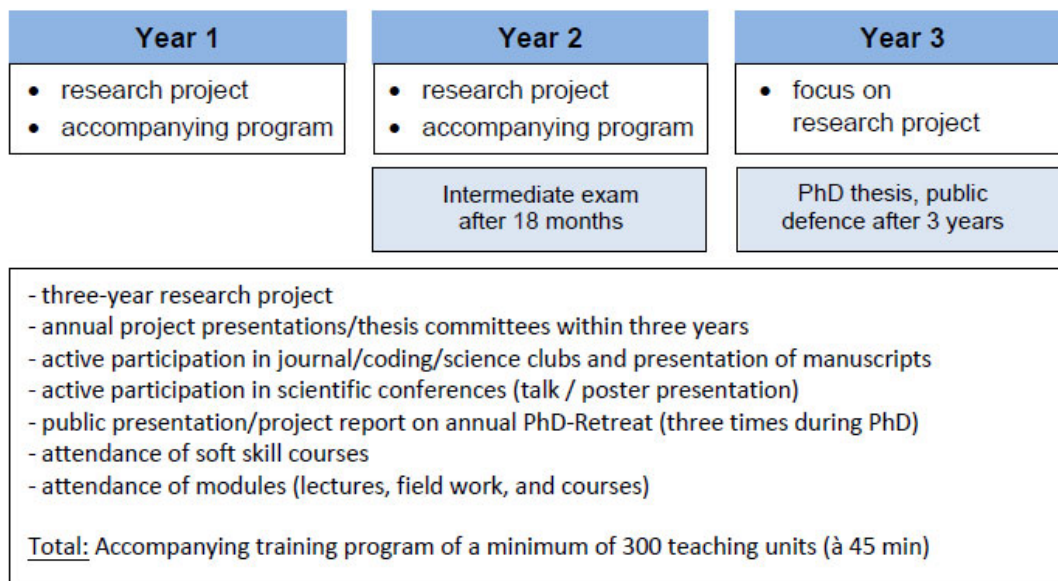


You may replace up to 30 hours of the Thursday seminars and tutorials by the additional offers

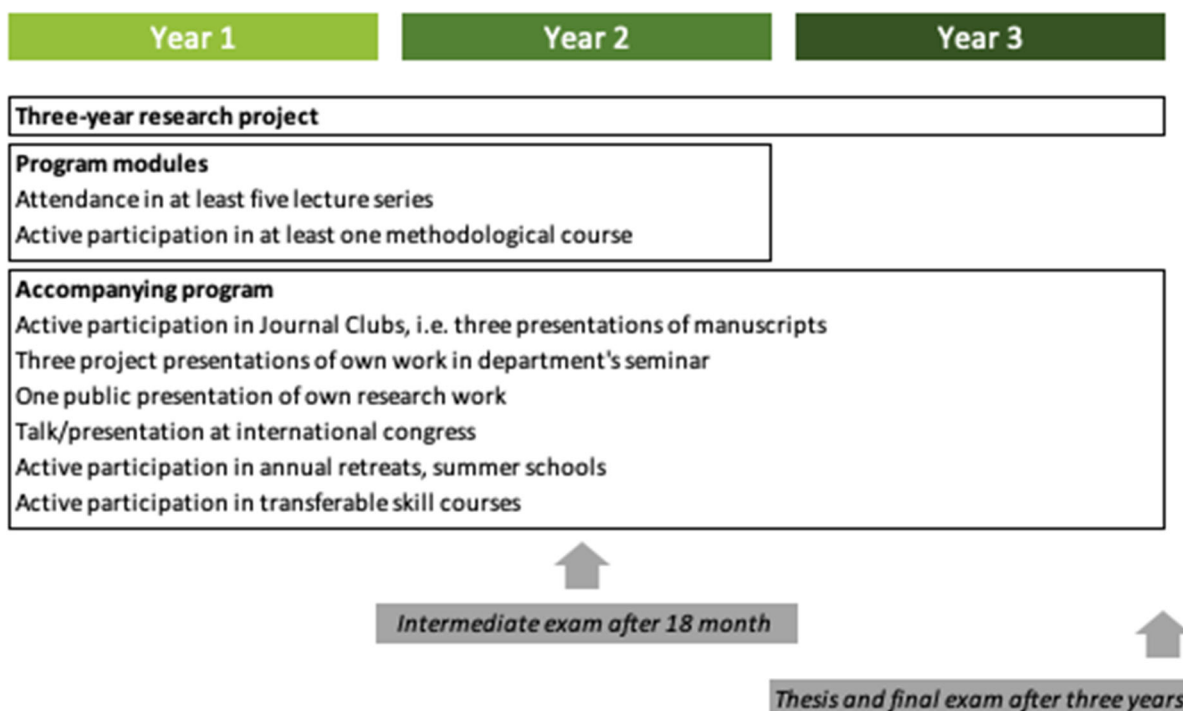
”Meet the Investigator” or “Method based seminar”

see page 46

## Structure of the PhD-Program “Epidemiology”



## Structure of the PhD-Program BIOMEDAS (“Biomedical Data Science”)



# !!Obligatory!!

## Good Scientific Practice

For all HBRS PhD and StrucMed students

Introduction, Overview, Basics, Data Management, Ethics

*Lecturers: Dr Beate Schwinzer, Dr. Stephan Halle and Dr Olga Halle*

### Wednesday, 1 November 2023

- 4.00 pm First Seminar: Good Scientific Practice
- 5.30 pm Introduction and Data Management; Beate Schwinzer  
Lecture Hall A, building J2

### Thursday, 2 November 2023

- 4.00 pm Second Seminar: Good Scientific Practice
- 5.30 pm Scientific Misconduct and Plagiarism; Beate Schwinzer  
Lecture Hall A, building J2

### Friday, 3 November 2023

- 4.00 pm Third Seminar: Good Scientific Practice
- 5.30 pm Ethics and Statistics; Dr Stephan and Dr Olga Halle  
Lecture Hall A, building J2

## MD/PhD "Molecular Medicine"

### 1<sup>st</sup> Semester

**Note:** The curriculum of the first year is more orientated towards basics and methods in the different disciplines.

**MD / PhD "Molecular Medicine":** There are some alternative in-depth seminars / tutorials on Mondays for medical students and students from life sciences until Christmas (see pages 17 / 18) and the respective tutorials for the seminars.

HBRS Opening: Monday, 9 October 2023, 5.00 pm (building J6, lecture hall R)				
Haematopoiesis - Episode I and Team Clock (Focus Immunology I) Lecture hall A	Seminar	Monday, 16.10.2023	4.30 - 6.00 pm	Christine Falk
Innate immunity (Focus Immunology II) Lecture hall A	Seminar	Monday, 23.10.2023	4.30 - 6.00 pm	Annett Ziegler
B cells and antibody responses (Focus Immunology III) Lecture hall A	Seminar	Monday, 30.10.2023	4.30 - 6.00 pm	Siegfried Weiß
T cells and T cell responses (Focus Immunology IV) Lecture hall A	Seminar	Monday, 06.11.2023	4.30 - 6.00 pm	Hristo Georgiev
Cytotoxic T cell responses (Focus Immunology V) Lecture hall A	Seminar	Monday, 13.11.2023	4.30 - 6.00 pm	Berislav Bosnjak

**Now you have the choice between either Oncology \*or\* Microbiology:**

### In HBRS Seminar room (Oncology):

<b>Disease modelling and drug discovery with the CRISPR-Cas9 system</b>	Seminar	Monday, 20.11.2023	4.30 - 6.00 pm	Sylvia Merkert
<b>Genetic modification with lentiviral vector technologies</b>	Seminar	Monday, 27.11.2023	4.30 - 6.00 pm	Tobias Mätzig
<b>Design and application of shRNA-based methods in biomedical research</b>	Seminar	Monday, 04.12.2023	4.30 - 6.00 pm	Tobias Mätzig
<b>Induced pluripotent stem cell resources for the treatment of congenital diseases</b>	Seminar	Monday, 11.12.2023	4.30 - 6.00 pm	Nico Lachmann
<b>Gene expression analysis in cancer research</b>	Seminar	Monday, 18.12.2023	4.30 - 6.00 pm	Michael Morgan
<b>Mouse models</b>	Seminar	Monday, 08.01.2024	4.30 - 6.00 pm	Arnold Kloos

### In lecture hall A (Microbiology):

<b>Intro and Paradigms in Infection Biology: Toxoplasma (Focus Microbiology I)</b>	Seminar	Monday, 20.11.2023	4.30 - 6.00 pm	Dirk Schlüter
<b>Paradigms of Infection Biology: Streptococci and Staphylococci (Focus Microbiology II)</b>	Seminar	27.11.2023	4.30 - 6.00 pm	Volker Winstel
<b>Paradigms of Infection Biology: Salmonella (Focus Microbiology III)</b>	Seminar	Monday, 04.12.2023	4.30 - 6.00 pm	Guntram Graßl
<b>Paradigms of Infection Biology: C. difficile and host responses at the intestinal barrier (Focus Microbiology IV)</b>	Seminar	Monday, 11.12.2023	4.30 - 6.00 pm	Matthias Lochner
<b>Paradigms in Infection Biology: Malaria (Focus Microbiology V)</b>	Seminar	Monday, 18.12.2023	4.30 - 6.00 pm	Nishanth Gopala Krishna
<b>Paradigms of Infection Biology: (Focus Microbiology VI) Role of the commensal bacteria for human health</b>	Seminar	Monday, 08.01.2024	4.30 - 6.00 pm	Marius Vital



<b>Location seminar: Lecture hall B, building J2</b> <b>Location tutorial: HBRS seminar room 1140, building J4, level 01 (2<sup>nd</sup> floor)</b>				
<b>Transcription + Replication (not Flaviviridae)</b> <b>(Focus Virology I)</b>	Seminar	Monday, 15.01.2024	4.30 - 6.00 pm	Anke Kraft
	Tutorial	Monday, 22.01.2024	3.15 - 4.15 pm	Anke Kraft
<b>RNA Virus – Emerging Viruses, Taxonomy of Viruses and Viral Diseases</b> <b>(Focus Virology II)</b>	Seminar	Monday, 22.01.2024	4.30 - 6.00 pm	Jens Bohne
	Tutorial	Monday, 29.01.2024	3.15 - 4.15 pm	Jens Bohne
<b>DNA Virus Transcription + Replication</b> <b>(Focus Virology III)</b>	Seminar	Monday, 29.01.2024	4.30 - 6.00 pm	Daniel Depledge
	Tutorial	Monday, 05.02.2024	3.15 - 4.15 pm	Daniel Depledge
<b>Virus assembly, maturation and egress</b> <b>(Focus Virology IV)</b>	Seminar	Monday, 05.02.2024	4.30 - 6.00 pm	Katinka Döhner / Beate Sodeik
	Tutorial	Monday, 12.02.2024	3.15 - 4.15 pm	Katinka Döhner / Beate Sodeik
<b>Oncogenic Viruses</b> <b>(Focus Virology V)</b>	Seminar	Monday, 12.02.2024	4.30 - 6.00 pm	Kai Kropp / Stein
	Tutorial	Monday, 19.02.2024	3.15 - 4.15 pm	Kai Kropp / Stein
<b>Viral Pathogenesis and Host Defense</b> <b>(Focus Virology VI)</b>	Seminar	Monday, 19.02.2024	4.30 - 6.00 pm	Abel Viejo Borbolla
	Tutorial	Monday, 26.02.2024	3.15 - 4.15 pm	Abel Viejo Borbolla
<b>Cell Biology I</b>	Seminar	Monday, 26.02.2024	4.30 - 6.00 pm	Hans Jörg Hauser

**\*For MD/PhD “Molecular Medicine” medical students only: Some more basics in life sciences**

As there are not many medical students this year, we will arrange an individual program for you!  
Or you visit the tutorials for life scientists.

Mondays, 3.15 - 4.15 pm

**\*\* For PhD students from life sciences only: Some basics in medicine / techniques**

<b>For MD / PhD “Molecular Medicine” only: General introduction, lectures, expectations etc.: answering of all last questions, election of class speaker</b>	Seminar	Monday, 16.10.2023	3.45 - 4.15 pm	Susanne Kruse
<b>Super resolution light microscopy</b>	Seminar	Monday, 23.10.2023	3.15 - 4.15 pm	Rudolf Bauerfeind
<b>Hannover Unified Biobank</b>	Seminar	Monday, 30.10.2023	3.15 - 4.15 pm	Thomas Illig
<b>No seminar because of animal course lectures</b>		Monday, 06.11.2023		
<b>Molecular Imaging</b>	Seminar	Monday, 13.11.2023	3.15 - 4.15 pm	Annika Heß
<b>Gene Technology and Biosafety</b>	Seminar	Monday, 20.11.2023	3.15 - 4.15 pm	Stephanie Groos
<b>Electron Microscopy</b>	<b>Seminar (online)</b>	Monday, 27.11.2023	3.15 - 4.15 pm	Ruth Knorr

<b>Cell sorting</b>	Seminar	Monday, 04.12.2023	3.15 - 4.15 pm	Matthias Ballmaier
<b>Clinical Immunology: Pathogenesis of an autoimmune disease (Lupus erythematosus)</b>	Seminar	Monday, 11.12.2023	3.15 - 4.15 pm	Torsten Witte
<b>Informal get-together with Christmas biscuits: Feedback / Discussions / Questions</b>	Seminar	Monday, 18.12.2023	3.15 - 4.15 pm	Susanne Kruse and Birgit Müller
<b>Asthma/ Allergy research and applications</b>	Seminar	Monday, 08.01.2024	3.15 - 4.15 pm	Ruth Grychtol
<b>Immunotherapy and cancer vaccines</b>	Seminar	Monday, 15.01.2024	3.15 - 4.15 pm	Tetyana Yevsa
<b>Location: Hannover Biomedical Research School, HBRS seminar room 1140, building J4, level 01 (2<sup>nd</sup> floor)</b>				

## MD/PhD Molecular Medicine

### 2<sup>nd</sup> Semester

**MD / PhD MM: Please attend all of the seminars and tutorials listed below.**

<b>4.) General Cell Biology</b>				
<b>The cell cycle and its implications in diseases (Focus Cell Biology I)</b>	Seminar lecture hall B	Monday, 26.02.2024	4.30 - 6.00 pm	Hansjörg Hauser
	Tutorial	08.04.2024	3.15 - 4.15 pm	Hansjörg Hauser
<b>Molecular mechanisms of gene regulation (Focus Cell Biology II)</b>	Seminar lecture hall B	Monday, 08.04.2024	4.30 - 6.00 pm	Dagmar Wirth
	Tutorial HBRS seminar room	Monday, 15.04.2024	3.15 - 4.15 pm	Dagmar Wirth
<b>The structure of the cell's interior (Focus Cell Biology III)</b>	Seminar lecture hall B	Monday, 15.04.2024	4.30 - 6.00 pm	Theresia Stradal
	Tutorial	Monday, 22.04.2024	3.15 - 4.15 pm	Theresia Stradal
<b>(Now for MD / PhD MM only) All seminars and tutorials in HBRS seminar room</b>				
<b>5.) Biochemistry and Genetics; methods</b>				
<b>Next generation sequencing</b>	<b>Seminar / tutorial</b>	Monday, 22.04.2024	4.30 - 6.00 pm	Robert Geffers (HZI)
<b>Transcriptomics  (seminar / tutorial in building J3, level 01, room 2020)</b>	<b>Seminar</b>	Monday, 29.04.2024	4.30 - 6.00 pm	Oliver Dittrich- Breiholz
	<b>Tutorial</b>	06.05.2024	<b>4.15 - 5.15 pm</b>	Oliver Dittrich- Breiholz

	<b>No seminar</b>	06.05.2024		
<b>Physical Methods in Biochemistry: Characterization of Protein - Protein Interactions</b>	Seminar	Monday, 13.05.2024	4.30 - 6.00 pm	Ute Curth
	Tutorial	Monday, 27.05.2024	3.15 - 4.15 pm	Ute Curth
<b>No lectures, public holiday</b>		<b>Monday, 20.05.24</b>		
<b>The adaptive immune system and immunological methods</b>	Seminar	Monday, 27.05.2024	4.30 - 6.00 pm	Agnes Bonifacius et al.
	Tutorial <b>(building J6, level S0 (seminar room 75, room no. 4140))</b>	Monday, 03.06.2024	3.15 - 4.15	Agnes Bonifacius et al.
<b>TBA</b>	Seminar	Monday, 03.06.2024	4.30 – 6.00 pm	NN
	Tutorial	Monday, 10.06.2024	3.15 – 4.15 pm	NN
<b>Proteomics</b>	Seminar	Monday, 10.06.2024	4.30 - 6.00 pm	Andreas Pich
<b>Metabolomics</b>	Tutorial	Monday, 17.06.2024	3.15 - 4.15 pm	Heike Bähre
<b>Stem cells</b>	Seminar	Monday, 17.06.2024	4.30 - 6.00 pm	Axel Schambach
	Tutorial	Monday, 24.06.2024	3.15 - 4.15 pm	Axel Schambach
<b>Genome-wide association studies and functional validation</b>	Seminar	Monday, 24.06.2024	4.30 - 6.00 pm	Dhanya Ramachandran
	Tutorial	Monday, 01.07.2024	3.15 - 4.15 pm	Dhanya Ramachandran
<b>Techniques of miRNAs and lncRNAs</b>	Seminar	Monday, 01.07.2024	4.30 - 6.00 pm	Jan Fiedler
	Tutorial	Monday, 08.07.24	3.15 - 4.15 pm	Jan Fiedler

**Location: Hannover Biomedical Research School, HBRS seminar room 1140, building J4, level 01 (2<sup>nd</sup> floor)**

## MD/PhD program “Molecular Medicine”

### 3<sup>rd</sup> Semester

**Note: The curriculum of the second year is more orientated towards research and applied aspects in the different disciplines. Every student has the choice between two major foci each semester. You may vary in the choice of modules between the two foci. Please, choose the ones most appropriate for you and your project!**

#### 1. Focus: Immunology

Location: Hannover Biomedical Research School, building J4, level 01 (2<sup>nd</sup> floor), seminar room 1031

1. Immune cells and organs				
Mononuclear-phagocyte system: development and the role in homeostasis	Seminar	Monday, 16.10.2023	4.30 - 6.00 pm	Jaba Gamrekelashvili
	Tutorial	Monday, 23.10.2023	3.30 - 4.15 pm	Jaba Gamrekelashvili
Inborn errors of immunity-cellular and molecular mechanisms of immunodeficiency and immune dysregulation	Seminar	Monday, 23.10.2023	4.30 - 6.00 pm	Georgios Sogkas
	Tutorial	Monday, 30.10.2023	3.30 - 4.15 pm	Georgios Sogkas
Adjuvants	Seminar	Monday, 30.10.2023	4.30 - 6.00 pm	Annett Ziegler
	Tutorial	Monday, 06.11.2023	3.30 - 4.15 pm	Annett Ziegler

2. Autoimmunity				
TBA	Seminar	Monday, 06.11.2023	4.30 - 6.00 pm	Julia Hengst
	Tutorial	Monday, 13.11.2023	3.30 - 4.15 pm	Julia Hengst
Immune response in HIV	Seminar	Monday, 13.11.2023	4.30 - 6.00 pm	Georg Behrens
	Tutorial	Monday, 20.11.2023	3.30 - 4.15 pm	Georg Behrens

<b>3. Allergy and Asthma, Immunological diseases</b>				
<b>Neuroimmune interactions in asthma bronchiale</b>	Seminar	Monday, 20.11.2023	4.30 - 6.00 pm	Armin Braun (Fraunhofer Institute)
	Tutorial	Monday, 27.11.2023	3.30 - 4.15 pm	Armin Braun (Fraunhofer Institute)
<b>Immunodermatology</b>	Seminar	Monday, 27.11.2023	4.30 - 6.00 pm	Lennar Rösner
	Tutorial	Monday, 04.12.2023	3.30 - 4.15 pm	Lennart Rösner
<b>Studying allergic airway inflammation: of mice and man</b>	Seminar	Monday, 04.12.2023	4.30 - 6.00 pm	Olga Halle
	Tutorial	Monday, 11.12.2023	3.30 - 4.15 pm	Adan Jirno
<b>Molecular and cellular mechanisms of inflammatory immune responses</b>	Seminar	Monday, 11.12.2023	4.30 - 6.00 pm	Niko Föger
	Tutorial	Monday, 18.12.2023	3.30 - 4.15 pm	Niko Föger
<b>4. Signalling and therapy</b>				
<b>Major histocompatibility complex in tolerogenic cell therapies</b>	Seminar	Monday, 18.12.2023	4.30 - 6.00 pm	Constanca Ferreira de Figueiredo
	Tutorial	Monday, 08.01.2024	3.30 - 4.15 pm	Constanca Ferreira de Figueiredo
<b>Protective adaptive immunity to viral infections</b>	Seminar	Monday, 08.01.2024	4.30 - 6.00 pm	Agnes Bonifacius et al.
	Tutorial	Monday, 15.01.2024	3.30 - 4.15 pm	Agnes Bonifacius et al.
<b>Inhibitory receptor-ligand interactions as targets for transplantation tolerance</b>	Seminar	Monday, 15.01.2024	4.30 - 6.00 pm	Reinhard Schwinzer
	Tutorial (Fraunhofer Institute)	Monday, 22.01.2024	3.30 - 4.15 pm	Reinhard Schwinzer
<b>Early events of the pathogenesis of acute and chronic respiratory diseases in human peripheral lung tissue</b>	Seminar (Fraunhofer Institute)	Monday, 22.01.2024	4.30 - 6.00 pm	Katherina Sewald
	Tutorial	Monday, 29.01.2024	3.30 - 4.15 pm	Katherina Sewald
<b>Immune sensors</b>	Seminar	Monday, 29.01.2024	4.30 - 6.00 pm	Roman Fedorov
	Tutorial	Monday, 05.02.2024	3.30 - 4.15 pm	Roman Fedorov

<b>Tumor immunity and oncogenic signalling</b>	Seminar	Monday, 05.02.2024	4.30 - 6.00 pm	Christine Falk
	Tutorial	Monday, 12.02.2024	3.30 - 3.15 pm	Christine Falk
<b>Primary immunodeficiency syndromes</b>	Seminar	Monday, 12.02.2024	4.30 - 6.00 pm	Manfred Anim
	Tutorial	Monday, 19.02.2024	3.30 - 3.15 pm	Manfred Anim
<b>Location: Hannover Biomedical Research School, building J4, level 01 (2<sup>nd</sup> floor), seminar room 1031</b>				



## 2. Focus: Genetics and Cell Biology

Location: Hannover Biomedical Research School, building J4, level S0 (ground floor), seminar room S 1400 (right to the main entrance)

<b>1. Techniques and diagnostics / therapy, genetics</b>				
<b>Embryonic and somatic cloning in mammals</b>	Seminar	Monday, 16.10.2023	4.30 - 6.00 pm	Heiner Niemann
	Tutorial	Monday, 23.10.2023	3.30 - 4.15 pm	Heiner Niemann
<b>How molecular motors work</b>	Seminar	Monday, 23.10.2023	4.30 - 6.00 pm	Dietmar Manstein
	Tutorial	Monday, 30.10.2023	3.30 - 4.15 pm	Dietmar Manstein
<b>Molecular mechanisms of heart failure</b>	Seminar	Monday, 30.10.2023	4.30 - 6.00 pm	Melanie Ricke-Hoch
	Tutorial	Monday, 06.11.2023	3.30 - 4.15 pm	Maren Heimerl
<b>RNA Biology in Eukaryotes</b>	Seminar	Monday, 06.11.2023	4.30 - 6.00 pm	Halyna Shcherbata
	Tutorial	Monday, 13.11.2023	3.30 - 4.15 pm	Halyna Shcherbata

<b>2. Signalling</b>				
<b>Functional role of Fibulin 6 in wound repair: implications for cardiac remodelling</b>	Seminar	Monday, 13.11.2023	4.30 - 6.00 pm	Christine Herzog
	Tutorial	Monday, 20.11.2023	3.30 - 4.15 pm	Christine Herzog
<b>Neutrophil NETosis and extravasation are influenced by sodium channel Nav1.3</b>	Seminar	Monday, 20.11.2023	4.30 - 6.00 pm	Frank Echtermeyer
	Tutorial	Monday, 27.11.2023	3.30 - 4.15 pm	Frank Echtermeyer
<b>Molecular mechanisms of vascular aging in health and disease</b>	Seminar	Monday, 27.11.2023	4.30 - 6.00 pm	Yulia Kiyan
	Tutorial	Monday, 04.12.2023	3.30 - 4.15 pm	Yulia Kiyan
<b>Small GTPases as targets of bacterial toxins</b>	Seminar	Monday, 04.12.2023	4.30 - 6.00 pm	Harald Genth
	Tutorial	Monday, 11.12.2023	3.30 - 4.15 pm	Harald Genth
<b>3. Cell Biology and disease</b>				
<b>Molecular mechanisms in cardiorenal syndrome</b>	Seminar	Monday, 11.12.2023	4.30 - 6.00 pm	Maren Leifheit-Nestler
	Tutorial	Monday, 08.01.2024	3.30 - 4.15 pm	Maren Leifheit-Nestler
<b>NN</b>	Seminar	Monday, 18.12.2023	4.30 - 6.00 pm	Svjetlana Loric
	Tutorial	Monday, 08.01.2024	4.30 - 5.30 pm	Svjetlana Loric
<b>Glycosylation and diseases</b>	Seminar	Monday, 15.01.2024	4.30 - 6.00 pm	Hans Bakker
	Tutorial	Monday, 22.01.2024	3.30 - 4.15 pm	Hans Bakker
<b>Membrane domains</b>	Seminar	Monday, 22.01.2024	4.30 - 6.00 pm	Robert Lindner
	Tutorial	Monday, 29.01.2024	3.30 - 4.15 pm	Robert Lindner

<b>Micro RNAs from disease mechanisms to therapeutic approaches</b>	Seminar	Monday, 29.01.2024	4.30 - 6.00 pm	Shambhabi Chatterjee
	Tutorial	Monday, 05.02.2024	3.30 - 4.15 pm	Shambhabi Chatterjee
<b>Liver fibrogenesis - basic mechanisms and clinical implications</b>	<b>Seminar (online)</b>	Monday, 05.02.2024	4.30 - 6.00 pm	Ingmar Mederacke
	<b>Tutorial (online)</b>	Monday, 12.02.2024	3.30 - 4.15 pm	Ingmar Mederacke
<b>Interactions between signalling, metabolic pathways and miRNAs in HCC</b>	Seminar	Monday, 12.02.2024	4.30 - 6.30 pm	Asha Balakrishnan
	Tutorial	Monday, 19.02.2024	3.30 - 4.15 pm	Asha Balakrishnan
<b>Location: Hannover Biomedical Research School, building J4, level S0 (ground floor), seminar room S 1400 (right to the main entrance)</b>				

## MD/PhD program “Molecular Medicine”

### 4<sup>th</sup> Semester

#### 3. Focus: Infection and Immunity

This focus is not offered this year.

#### 4. Focus: Differentiation and Oncology

Location: Hannover Biomedical Research School, building J4, level 01 (2<sup>nd</sup> floor), seminar room 1031

<b>1. Development and cancer</b>				
<b>Liquid biopsies and biomarkers</b>	<b>Seminar (online)</b>	Monday, 08.04.2024	4.30 - 6.00 pm	Anja Thorenz
	<b>Tutorial (online)</b>	Monday, 15.04.2024	3.30 - 4.15 pm	Anja Thorenz
<b>Liver organogenesis and hepatic stem cell</b>	Seminar	Monday, 15.04.2024	4.30 - 6.00 pm	Michael Ott
	Tutorial	Monday, 22.04.2024	3.30 - 4.15 pm	Michael Ott
<b>Epigenetics in cancer</b>	Seminar	Monday, 22.04.2024	4.30 - 6.00 pm	Ulrich Lehmann-Mühlenhoff
	Tutorial	Monday, 29.04.2024	3.30 - 4.15 pm	Ulrich Lehmann-Mühlenhoff
<b>2. Stem cells and cancer</b>				
<b>Onco-Immunology: Translational research at the interface between immunology and oncology</b>	Seminar	Monday, 29.04.2024	4.30 - 6.00 pm	Friedrich Feuerhake
	Tutorial	Monday, 06.05.2024	3.30 - 4.15 pm	Friedrich Feuerhake
<b>AVV</b>	Seminar	Monday, 06.05.2024	4.30 - 6.00 pm	Hildegard Büning
	Tutorial	Monday, 13.05.2024	3.30 - 4.15 pm	Hildegard Büning

<b>Adoptive T cell therapies in hematopoietic stem cell transplantation</b>	Seminar	Monday, 13.05.2024	4.30 - 6.00 pm	Martin Sauer
	Tutorial	Monday, 27.05.2024	3.30 - 4.15 pm	Martin Sauer
<b>No lectures, public holiday</b>		<b>Monday, 20.05.24</b>		

PH-regulation in cancer cell motility	Seminar	Monday, 27.05.2024	4.30 - 6.00 pm	Christian Stock
	Tutorial	Monday, 03.06.2024	3.30 - 4.15 pm	Christian Stock
<b>3. Signalling (and cancer)</b>				
<b>Oncogenes and myeloproliferation</b>	Seminar	Monday, 03.06.2024	4.30 - 6.00 pm	Matthias Eder / Hanna Kirchhoff
	Tutorial	Monday, 10.06.2024	3.30 - 4.15 pm	Matthias Eder / Hanna Kirchhoff
<b>T-box genes in development and disease</b>	Seminar	Monday, 10.06.2024	4.30 - 6.00 pm	Andreas Kispert
	Tutorial	Monday, 17.06.2024	3.30 - 4.15 pm	Andreas Kispert
<b>Cholangiocarcinoma – two perspectives</b>	Seminar	Monday, 17.06.2024	4.30 - 6.00 pm	Anna Saborowski
	Tutorial	Monday, 24.06.2024	3.15 - 4.15 pm	Anna Saborowski
<b>Molecular basis of leukemogenesis</b>	Seminar	Monday, 24.06.2024	4.30 - 6.00 pm	Michael Morgan
	Tutorial	Monday, 01.07.2024	3.15 - 4.15 pm	Michael Morgan
<b>Location: Hannover Biomedical Research School, building J4, level 01 (2<sup>nd</sup> floor), seminar room 1031</b>				

## PhD programs "Infection Biology / DEWIN"

<b>1st Semester</b>				
<b>Tutorials:</b> Mondays, 15:15-16:15 hrs			<b>Seminars:</b> Mondays, 16:30-18:00 hrs	
<b>Location:</b> Room 1140, Building J4, level1			<b>Location:</b> Lecture Hall A, Building J2	
DATE	TYPE	FOCUS	LECTURER	SUBJECT
09.10.2023	HBRS Opening: 17:00 - 19:00 hrs (Building J6, Lecture Hall R)			
16.10.2023	Seminar	Immunology I	Falk	Haematopoiesis - Episode 1 and Team Clock
23.10.2023	Seminar	Immunology II	Ziegler	Innate Immunity
30.10.2023	Seminar	Immunology III	Weiß	B cells and antibody responses
06.11.2023	Seminar	Immunology IV	Georgiev	T cells and T cell responses
13.11.2023	Seminar	Immunology V	Bosnjak	Cytotoxic T cell responses
20.11.2023	Seminar	Microbiology I	Schlüter	Intro and Toxoplasma
27.11.2023	Seminar	Microbiology II	Winstel	Streptococci and Staphylococci
04.12.2023	Seminar	Microbiology III	Graßl	Salmonella

DATE	TYPE	FOCUS	LECTURER	SUBJECT
11.12.2023	Seminar	Microbiology IV	Lochner	C. difficile and host responses at the intestinal barrier
18.12.2023	Seminar	Microbiology V	Nishanth	Malaria
08.01.2024	Seminar	Microbiology VI	Vital	Role of the commensal bacteria for human health
15.01.2024	Seminar	Virology I	Kraft	Virus Taxonomy and Viral Diseases
22.01.2024	Seminar	Virology II	Bohne	RNA Virus – Emerging Viruses, Transcription + Replication
29.01.2024	Seminar	Virology III	Depledge	DNA Virus Transcription + Replication
05.02.2024	Seminar	Virology IV	Döhner	Virus assembly, maturation and egress
12.02.2024	Seminar	Virology V	Stein	Oncogenic Viruses
19.02.2024	Seminar	Virology VI	Viejo-Borbolla	Viral Pathogenesis and Host Defenses
26.02.2024	Seminar	Cell Biology I	Hauser	The cell cycle and its implication in diseases

## PhD Programs "Infection Biology / DEWIN"

<b>2nd Semester</b>				
<b>Tutorials:</b> Mondays, 15:15-16:15 hrs <b>Location:</b> Room 1140, Building J4, level1			<b>Seminars:</b> Mondays, 16:30-18:00 hrs <b>Location:</b> Lecture Hall A, Building J2	
DATE	TYPE	FOCUS	LECTURER	SUBJECT
08.04.2024	Seminar	Cell Biology II	Wirth	Molecular mechanisms of gene regulation
15.04.2024	Seminar	Cell Biology III	Stradal	The structure of the cell's interior
<b>Times &amp; Location:</b> Mondays, 16:30-18:00 hrs, MHH, TPFZ/I-11, Seminar Room S0-1410				
DATE	FOCUS	SUPERVISOR	STUDENT	SUBJECT
22.04.2024	Project Presentation			
	Topic Focus			
29.04.2024	Project Presentation			
	Topic Focus			
06.05.2024	Project Presentation			
	Topic Focus			
13.05.2024	Project Presentation			
	Topic Focus			
21.05.2024 <b>Tuesday</b>	Project Presentation			
	Topic Focus			
27.05.2024	Project Presentation			
	Topic Focus			
03.06.2024	Project Presentation			
	Topic Focus			
10.06.2024	Project Presentation			
	Topic Focus			
17.06.2024	Project Presentation			
	Topic Focus			
24.06.2024	Project Presentation			
	Topic Focus			



## PhD Programs “Infection Biology / DEWIN”

<b>3rd Semester</b>				
<b>Times &amp; Location: Mondays, 16:30-18:00 hrs, MHH, TPFZ/I-11, Seminar Room S0-1420</b>				
DATE	FOCUS	SUPERVISOR	STUDENT	SUBJECT
09.10.2023	HBRS Opening: 17:00 - 19:00 hrs (Building J6, Lecture Hall R)			
16.10.2023	Topic	Georgiev	Hoblos	Differentiation and function of T-helper cells during infection
	Original Paper		Rahmel	Zander et al., Tfh-cell-derived interleukin 21 sustains effector CD8+ T cell responses during chronic viral infection. <i>Immunity</i> . 2022
23.10.2023	Topic	Weiß	Chowdhury	B cell responses during infection
	Original Paper		Salam	Kotaki et al., SARS-CoV-2 Omicron-neutralizing... / Kaku et al., Recall of pre-existing cross-reactive..., <i>Sci. Immunol.</i> 2022
30.10.2023	Topic	Sodeik	Laue	Antiviral drugs against Influenza virus
	Original Paper		Aquino Ruiz	Gonzalez Lopez Ledesmaa et al., Dengue virus NS5 degrades ERC1 during infection to antagonize NF- $\kappa$ B activation, <i>PNAS</i> 2023
06.11.2023	Topic	Viejo-Borbolla	Loliashvili	Molecular mechanisms of Herpes simplex virus latency and reactivation
	Original Paper		Ayanwale	Sherwood et al., Hepatitis C virus RNA is 5'-capped with flavin adenine dinucleotide, <i>Nature</i> 2023
13.11.2023	Topic	Vital	Vu	Intrahost evolution of microbiota
	Original Paper		Truthe	Fabbrini et al., Exploring clade differentiation of the <i>Faecalibacterium prausnitzii</i> complex, <i>iScience</i> 2022
20.11.2023	Topic	Depledge	Schenk	Viral modulation of cellular metabolism
	Original Paper		Kalkan	Nestić-D et al. Human Adenovirus Type 26 Infection Mediated by $\alpha\beta$ 3 Integrin Is Caveolin-1-Dependent.
27.11.2023	Topic	Steffen	Ayanwale	Cellular restriction factors interfering with HIV
	Original Paper		Wenk-Senst	Schiffedercker-S et al., Direct Capsid Labeling of Infectious HIV-1 by Genetic Code Expansion Allows..., <i>mBio</i> . 2022
04.12.2023	Topic	Suwandi	Truthe	Lung microbiome
	Original Paper		Cai	Li et al., <i>Neisseria</i> species as pathobionts in bronchiectasis, <i>Cell Host &amp; Microbe</i> , 2022

DATE	FOCUS	SUPERVISOR	STUDENT	SUBJECT
11.12.2023	Topic	Kefalakes	Elsayed	The inflammasome and its modulation by bacterial and viral infections
	Original Paper		Cuvalo	Safik et al., Inflammasome activation in infected macrophages drives COVID-19 pathology, Nature 2022
18.12.2023	Topic	Nilsson-Payant	Kalkan	Pros and Cons of vector-based vaccines (e.g., VSV, MVA, AdV-Vectors)
	Original Paper		Loliashvili	Uzonyi-A et al., Exclusion of m6A from splice-site proximal regions by the exon junction complex dictates m6A topologies and mRNA stability. Mol Cell. 2023
08.01.2024	Topic	Kalinke	Riemann	Innate immune responses against infections: PAMPs, TLR, NOD
	Original Paper		Wang	Fruhwrth et al., TREM2 is down-regulated by HSV1 in microglia and involved in antiviral defense in the brain, Science Adv. 2023
15.01.2024	Topic	Halle	Salam	The role of NK cells in fighting infections
	Original Paper		Görtz	Mettelman et al., Baseline innate and T cell populations are correlates of protection against ..., Nat Immunol 2023
22.01.2024	Topic	Behrendt	Aquino Ruiz	Entry receptors and entry pathways of flaviviruses
	Original Paper		Laue	Lin et al., The NSP4 T492I mutation increases SARS-CoV-2 infectivity by altering non-structural protein cleavage. Cell Host & Microbe 2023
29.01.2024	Topic	Winstel	Cai	Function of extracellular vesicles in immunity
	Original Paper		Vu	Youn et al., Neutrophil-intrinsic TNF receptor signaling orchestrates host defense .... Sci. Adv. 2023
05.02.2024	Topic	Behrens	Cuvalo	Antigen presentation in bacterial and viral infection
	Original Paper		Elsayed	Augusto et al., A common allele of HLA is associated with asymptomatic SARS-CoV-2 infection, Nature 2023
12.02.2024	Topic	Schreiner	Wenk-Sens	Viral budding processes at different cellular membranes (ER, Golgi, Plasma Membrane, Nuclear membrane; common principles and differences)
	Original Paper		Schenk	Wang-LW et al., Epstein-Barr-Virus-Induced One-Carbon Metabolism Drives B Cell Transformation. Cell Metab. 2019
19.02.2024	Topic	Witte	Görtz	Anti-viral therapies
	Original Paper		Hoblos	Shen et al., Evidence of a Sjögren's disease-like phenotype following COVID-19 in..., JCI Insight 2023
26.02.2024	Topic	Lochner	Rahmel	Intestinal immunity to pathogens
	Original Paper		Chowdhury	Siracusa et al., Short-term dietary changes can result in mucosal and systemic immune depression, nature immunology 2023

## PhD Programs “Infection Biology / DEWIN”

<b>4th Semester</b>				
<b>Times &amp; Location: Mondays, 16:30-18:00 hrs, MHH, TPFZ/I-11, Seminar Room S0-1420</b>				
<b>DATE</b>	<b>FOCUS</b>	<b>SUPERVISOR</b>	<b>STUDENT</b>	<b>SUBJECT</b>
08.04.2024	Topic	Hühn	Wang	Limiting the immune response
	Original Paper		Riemann	Akagbosu et al., Novel antigen-presenting cell imparts Treg-dependent tolerance to gut microbiota, Nature 2022
15.04.2024	Project Presentation	Steffen	Aquino Ruiz	Modulation of immune cell function by flavivirus non-structural proteins
	Project Presentation	Nilsson-Payant	Ayanwale	Defective interfering particles (DIPs) as novel effective antiviral tools against influenza and other emerging viral diseases
22.04.2024	Project Presentation	Slevogt	Truthe	The impact of the interaction of C-type lectin receptors for infections with potentially pulmonary pathogens
	Project Presentation	Galardini	Vu	Laboratory evolution of antimicrobial resistance through horizontal gene transfer in bacterial communities
29.04.2024	Project Presentation	Sodeik	Wenk-Senst	Docking of herpes simplex virus capsids to the nuclear pores and release of the viral genomes into the nucleoplasm for viral transcription and replication
	Project Presentation	Viejo-Borbolla	Schenk	Modulation of cellular metabolism and intrinsic immune responses by Varicella Zoster Virus
06.05.2024	Project Presentation	Kalinke	Rahmel	The role of direct and cross-presentation in the stimulation of HCMV-specific T-cell responses
	Project Presentation		Salam	Analysis of B cell responses against the hepatitis B surface antigen on the single cell level
13.05.2024	Project Presentation	Lochner	Görtz	Modulation of mitochondrial function in infections with <i>Clostridioides difficile</i>
	Topic Focus			
21.05.2024 <b>Tuesday</b>	Project Presentation	Witte	Elsayed	Novel mechanisms of immune dysregulation in seronegative spondyloarthropathies
	Project Presentation	Ravens	Wang	Understanding the impact of maternal factors and the developing microbiota on $\gamma\delta$ T cell functionalities in the neonate

DATE	FOCUS	SUPERVISOR	STUDENT	SUBJECT
27.05.2024	Project Presentation	Depledge	Loliashvili	Epitranscriptomic regulation of VZV infection
	Project Presentation	Schreiner-Gruber	Kalkan	Type-specific role of novel virus-host interplay during AdV infection cycle to improve vaccine vectors
03.06.2024	Project Presentation	Kefalakes	Chowdhury	Dissolving immune control of chronic hepatitis D virus infection – Data science
	Project Presentation		Hoblos	Characterization of the CD4+ T-cell response in chronic hepatitis D virus infection
10.06.2024	Project Presentation	Winstel	Cai	Discovery of human genetic signatures affecting extracellular trap formation
	Topic Focus			
17.06.2024	Project Presentation	Förster	Riemann	Immunological profiling of children with recurrent wheezing and its association with clinical outcome
	Project Presentation		Cuvalo	Characterizing anti HCMV immunity in an infection model of explanted human lungs
24.06.2024	Project Presentation	Behrendt	Laue	Pan-genotypic neutralizing antibodies as a therapeutic option against Hepatitis E Virus
	Topic Focus			

**Retreat:**

June 19<sup>th</sup>-20<sup>th</sup> 2024 for all Classes

**Intermediate Exam for the Class of 2022:**

March 12<sup>th</sup>, 2024

**PhD Final Exams:**

January 19<sup>th</sup>, 2024

June 14<sup>th</sup>, 2024

## *PhD Program “Regenerative Sciences”*

**Times** (unless otherwise stated and indicated in **bold**):

**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

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

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

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

**Hannover Unified Biobank (HUB)**

Dr. Norman Klopp  
Building M23 (CRC)  
Feodor-Lynen-Str.15, 30625 Hannover

1 <sup>st</sup> semester				
<b>Introductory lecture</b> - Welcoming speech - The curriculum of RegSci & HBRS - Principles of regenerative sciences and the REBIRTH approach	seminar	<b>Wednesday, 04.10.2023</b>	<b>10:30 – 12:00, lecture hall M, J1</b>	Ulrich Martin, Gaby Froriep
<b>Principles of growth factor signaling 1</b> - Paracrine and juxtacrine signaling - Signaling pathways involved in the regulation of growth	seminar	05.10.2023	4:15 – 5:45 pm	Rainer Niedenthal
<b>Principles of growth factor signaling 2</b> - Cytokines, hormones, and their receptors	seminar & tutorial	12.10.2023	3:00 – 4:30 pm	Michael Morgan
			4:45 – 5:45 pm	
<b>Principles of growth factor signaling 1</b> - Paracrine and juxtacrine signaling Signaling pathways involved in the regulation of growth	tutorial	19.10.2023	3:00 – 4:00 pm	Rainer Niedenthal
<b>Basic mechanisms of inflammation 1</b> - Innate and adaptive immunity and differentiation	seminar	19.10.2023	4:15 – 5:45 pm	Siegfried Weiß
	tutorial	26.10.2023	3:00 – 4:00 pm	
<b>Good Scientific Practice</b> Part 1: Introduction and Data Management <b>(MANDATORY!)</b>	seminar	<b>Wednesday, 01.11.2023</b>	<b>4:00 - 5:30 pm, lecture hall A, J2</b>	Beate Schwinzer
<b>Good Scientific Practice</b> Part 2: Scientific misconduct and plagiarism <b>(MANDATORY!)</b>	seminar	<b>Thursday, 02.11.2023</b>	<b>4:00 - 5:30 pm, lecture hall A, J2</b>	Beate Schwinzer
<b>Good Scientific Practice</b> Part 3: Ethics & Statistics <b>(MANDATORY!)</b>	seminar	<b>Friday, 03.11.2023</b>	<b>4:00 - 5:30 pm, lecture hall A, J2</b>	Olga Halle, Stephan Halle
<b>Principles of developmental biology and organogenesis 1</b> - Commitment, differentiation, apoptosis, patterning - Morphogenetic gradients and cell-cell communication - Genetic and epigenetic mechanisms	seminar	09.11.2023	4:15 – 5:45 pm	Andreas Kispert
	tutorial	16.11.2023	<b>1:15 – 2:15 pm</b>	
<b>Principles of developmental biology and organogenesis 2</b> - Model systems in developmental biology - Embryogenesis and fetal development	seminar	16.11.2023	<b>2:30 – 4:00 pm</b>	Andreas Kispert
	tutorial	23.11.2023	3:00 – 4:00 pm	
<b>Principles of stem cell biology 1</b> - Embryonic derivation of stem cells - Culture methods	seminar & tutorial	30.11.2023	3:00 – 4:30 pm	Thomas Müller
			4:45 – 5:45 pm	
<b>Principles of translational bioinformatics</b> <i>Please bring a laptop for the tutorial!</i>	seminar & tutorial	07.12.2023	3:00 – 4:30 pm	Maximilian Fuchs
			4:45 – 5:45 pm	

<b>Principles of cell engineering 1</b> - Coding and non-coding RNA (miRNA, siRNA, lncRNA, mRNA) - Technical approaches - RNA packaging - Luciferase-gene reporter assay - Experimental fails – what went wrong? (tutorial)	seminar & tutorial	14.12.2023	3:00 – 4:30 pm	Mandy Otto
			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	11.01.2024	4:15 – 5:45 pm	Amar Deep Sharma
	tutorial	18.01.2024	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	18.01.2024	4:15 – 5:45 pm	Axel Schambach
	tutorial	25.01.2024	3:00 – 4:00 pm	
<b>Basic mechanisms of inflammation 2</b> - Infection & cancer	seminar	25.01.2024	4:15 – 5:45 pm	Ulrich Lehmann-Mühlenhoff
	tutorial	01.02.2024	3:00 – 4:00 pm	
<b>Synthetic biology and options for regeneration</b>	seminar	01.02.2024	4:15 – 5:45 pm	Dagmar Wirth
	tutorial	08.02.2024	3:00 – 4:00 pm	
<b>Principles of cell engineering 3</b> - Cell expansion Bioreactors	seminar	08.02.2024	4:15 – 5:45 pm	Robert Zweigerdt
	tutorial	15.02.2024	3:00 – 4:00 pm	

## PhD Program “Regenerative Sciences”

2 <sup>nd</sup> semester				
<b>Laser technology in medicine - Imaging</b> - Basics of microscopy - Contrast mechanisms - Modern approaches in imaging - Superresolution microscopy	seminar & tutorial	04.04.2024	3:00 – 4:30 pm NIFE*	Alexander Heisterkamp
			4:45 – 5:45 pm NIFE*	
<b>Principles of growth factor engineering</b> - Engineering growth factors and their receptors for regenerative medicine	seminar	11.04.2024	4:15 – 5:45 pm	Michael Morgan
	tutorial	18.04.2024	3:00 – 4:00 pm	
<b>Animal models of human disease 1</b> - Murine models of human disease	seminar	18.04.2024	4:15 – 5:45 pm	Andreas Kispert
	tutorial	25.04.2024	3:00 – 4:00 pm	
<b>Animal models of human disease 2</b> - Humanized mouse models	seminar & tutorial	25.04.2024	4:15 – 5:45 pm	Fatih Noyan
<b>Animal models of human disease 3</b> - Drosophila melanogaster - Neuromuscular disorders (tutorial)	seminar	02.05.2024	4:15 – 5:45 pm	Halyna Shcherbata
	tutorial	16.05.2024	3.00 – 4:00 pm	
<b>Large animal models in biomedical research</b> - Transgenic pigs - Xenotransplantation - Donor animal engineering	seminar	23.05.2024	4:15 – 5:45 pm	Heiner Niemann
	tutorial	30.05.2024	3:00 – 4:00 pm	
<b>Principles of organ transplantation 1</b> - Heart, lung, and vessels	seminar	30.05.2024	4:15 – 5:45 pm	Maximilian Franz
	tutorial	06.06.2024	3:00 – 4:00 pm	
<b>Cardiovascular tissue engineering: Principles</b>	seminar	06.06.2024	4:15 – 5:45 pm	Birgit Andree
	tutorial	13.06.2024	3:00 – 4:00 pm	
<b>Principles of organ transplantation 2</b> - Liver, pancreas, and $\beta$ -cells	seminar	13.06.2024	4:15 – 5:45 pm	Michael Ott
	tutorial	20.06.2024	3:00 – 4:00 pm	
<b>Stem cell based organ regeneration</b> - Heart and clinical translation	seminar	20.06.2024	4:15 – 5:45 pm	Robert Zweigerdt
	tutorial	27.06.2024	3:00 – 4:00 pm	



## PhD Program “Regenerative Sciences”

3 <sup>rd</sup> semester				
<b>Regenerative approaches: Blood and immunity 1</b> - Thymus and T-cell development - B-cell development - Flow cytometry	seminar	05.10.2023	4:15 – 5:45 pm	Siegfried Weiß
	tutorial	12.10.2023	3:00 – 4:00 pm	Christine Falk
<b>AAV capsid engineering for in vivo gene therapy</b>	seminar & tutorial	19.10.2023	3:00 – 4:30 pm	Hildegard Büning
			4:45 – 5:45 pm	
<b>Regenerative approaches: Blood and immunity 2</b> - Principles of hematopoietic stem cell transplantation and lymphocyte infusions HLA system and HLA compatibility (tutorial)	seminar	26.10.2023	4:15 – 5:45 pm	Matthias Eder
	tutorial	02.11.2023	3:00 – 4:00 pm	Constanca Figueiredo
<b>Regenerative approaches: Blood and immunity 3</b> - Genetic disorders of hematopoiesis, Leukemia, and leukemogenic stem cells	seminar	02.11.2023	4:15 – 5:45 pm	Axel Schambach
	tutorial	09.11.2023	3:00 – 4:00 pm	
<b>Regenerative approaches: Liver 1</b> - Physiology and pathophysiological changes of the liver Liver cell therapy, basics in translation	seminar	09.11.2023	4:15 – 5:45 pm	Michael Ott
	tutorial	16.11.2023	3:00 – 4:00 pm	
<b>Regenerative approaches: Liver 2</b> - Liver regeneration and stem cells Stem cell-derived hepatocytes	seminar	23.11.2023	4:15 – 5:45 pm	Tobias Cantz
	tutorial	30.11.2023	3:00 – 4:00 pm	Tobias Cantz, Reto Eggenschwiler
<b>Regenerative approaches: Liver 3</b> - Liver tissue engineering - Artificial liver / extracorporeal devices	seminar	30.11.2023	4:15 – 5:45 pm	Tobias Cantz
	tutorial	07.12.2023	3:00 – 4:00 pm	Tobias Cantz, Reto Eggenschwiler
<b>Non-coding RNAs in cardiovascular disease</b> - Regeneration and therapeutic approaches	seminar	07.12.2023	4:15 – 5:45 pm	Christian Bär
	tutorial	14.12.2023	3:00 – 4:00 pm	Shambhabi Chatterjee
<b>Immunotoxicity &amp; immunomonitoring</b>	seminar	<b>11.01.2024</b>	4:15 – 5:45 pm	Christine Falk
	tutorial	<b>18.01.2024</b>	3:00 – 4:00 pm	
<b>Genotoxicity &amp; monitoring</b>	seminar & tutorial	25.01.2024	3:00 – 4:30 pm	Michael Rothe
			4:45 – 5:45 pm	
<b>Regenerative approaches: Blood and immunity 4</b> - Embryonic stem cell derived haematopoiesis	seminar & tutorial	01.02.2024	3:00 – 4:30 pm	Nico Lachmann
			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	08.02.2024	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 & tutorial	15.02.2024	3:00 – 4:30 pm	James Thackeray
			4:55 – 5:45 pm	
<b>Cell sorting</b> - Method based seminar - Visit to MHH sorter lab → instrumentation (tutorial)	seminar & tutorial	22.02.2024	3:00 – 4:30 pm	Matthias Ballmaier
			4:45 – 5:45 pm	
<b>Design of clinical trials &amp; regulation</b>	seminar	29.02.2024	4:15 – 5:45 pm	Heiko von der Leyen
<b>Animal experiments</b> - Introduction to animal experiments - Presentation of the animal house	seminar & tutorial	07.03.2024	3:00 – 4:30 pm	André Bleich
			4:45 – 5:45 pm	
<b>Patent protection of academic inventions</b>	seminar	14.03.2024	4:15 – 5:45 pm	Torben Söker, Ascenion GmbH
	tutorial	21.03.2024	3:00 – 4:00 pm	

## PhD Program “Regenerative Sciences”

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, 09.04.2024</b>	4:15 – 5:45 pm	Kai Wollert
	tutorial	11.04.2024	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 - Echocardiography (tutorial)	seminar	11.04.2024	4:15 – 5:45 pm	Melanie Ricke-Hoch
	tutorial	18.04.2024	3:00 – 4:00 pm	Maren Heimerl
<b>Regenerative approaches: Heart and vessels 3</b> - Angiogenesis and arteriogenesis in development and disease	seminar	25.04.2024	4:15 – 5:45 pm	Florian Limbourg
	tutorial	02.05.2024	3:00 – 4:00 pm	
<b>Regenerative approaches: Heart and vessels 4</b> - Cardiac differentiation of pluripotent stem cells & myocardial TE	seminar	02.05.2024	4:15 – 5:45 pm	Ina Gruh
<b>Regenerative approaches: Lung 1</b>	seminar	16.05.2024	4:15 – 5:45 pm	Ruth Olmer
	tutorial	23.05.2024	3:00 – 4:00 pm	
<b>Regenerative approaches: Lung 2</b>	seminar	23.05.2024	4:15 – 5:45 pm	
	tutorial	30.05.2024	3:00 – 4:00 pm	
<b>Autologous cells in Tissue Engineering</b>	seminar	30.05.2024	4:15 – 5:45 pm NIFE*	Cornelia Blume, Sebastian Heene
	tutorial	06.06.2024	3:00 – 4:00 pm NIFE*	
<b>Regenerative approaches: Heart and vessels 4</b> Cardiac differentiation of pluripotent stem cells & myocardial TE	tutorial	06.06.2024	4:15 – 5:45 pm	Ina Gruh
<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	13.06.2024	3:00 – 4:30 pm	Nadine Thau-Habermann
	tutorial		4:45 – 5:45 pm	Thomas Gschwendtberger
<b>The Axolotl – an Amphibian Model Organism of Regeneration</b>	seminar & tutorial	20.06.2024	3:00 – 4:30 pm Feodor-Lynen-Str. 21*	Sarah Strauß
			4:45 – 5:45 pm Feodor-Lynen-Str. 21*	
<b>Hannover Unified Biobank (HUB)</b>	seminar & tutorial	27.06.2024	3:00 – 4:30 pm	Norman Klopp
			4:45 – 5:45 pm HUB*	

<b>Good Manufacturing Practice (GMP), Advanced Therapy Medicinal Products (ATMP)</b>	seminar & tutorial	04.07.2024	3:00 – 4:30 pm Feodor-Lynen-Str. 21'	Stephan Klöß
			4:45 – 5:45 pm Feodor-Lynen-Str. 21'	

**Additional offers:**

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

**Meet The Expert(s)**

PhD program “Regenerative Sciences” meets STEMCELL Technologies	Sanja Sladic & Sonika Godavarthy, STEMCELL	HBRS	<b>FRIDAY, 03.11.2023</b>	10:00 am – 12:30 pm
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	<b>FRIDAY, 01.12.2023</b>	10:30 – 12:00 am

**Method-based Seminars**

Isolation and analysis methods for extracellular vesicles	Anton Selich, Exp. Hematology	HBZ	<b>TUESDAY, 09.01.2024</b>	03:00 – 05:00 pm
Telomeres & Telomerase: from measurement to manipulation of longevity	Shambhabi Chatterjee, IMTTS, MHH	HBZ	<b>TUESDAY, 23.01.2024</b>	4:00 – 6:00 pm
Methods for transcript expression and splicing analysis	Dhanya Ramachandran, Molecular Gynecology	HBZ	<b>TUESDAY 05.02.2024</b>	4.00 – 5:30 pm
Laser based methods for imaging and manipulation of cells and tissue	Stefan Kalies, IQO, LUH	NIFE*	<b>2024, tbd</b>	03:00 – 05:00 pm

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

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

**NIFE\*:**

Niedersächsisches Zentrum für Biomedizintechnik, Implantatforschung und Entwicklung - NIFE

(Lower Saxony Centre for Biomedical Engineering, Implant Research and Development)

Stadtfelddamm 34

30625 Hannover

## PhD Program "Auditory Sciences: Physics and Engineering, Physiology and Therapy of Hearing"

For further information and registration, please contact (if not noted otherwise):

[baumhoff.christine@mh-hannover.de](mailto:baumhoff.christine@mh-hannover.de) for courses in Hannover

[mark.pottek@uni-oldenburg.de](mailto:mark.pottek@uni-oldenburg.de) for courses in Oldenburg

### Obligatory courses:

Title	Instructor(s)	Credit	Time and place
<b>1.1 Clinic, Diagnostic and Therapy of Peripheral and Central Hearing Disorders</b>	Prof. Thomas Lenarz	25 hours 3 CP	MHH building K6, node B, 6 <sup>th</sup> floor, seminar room S66 On request
<b>1.2 Audiology and Physics of Hearing</b>	Prof. Hannes Maier	15 hours 11,5 CP	MHH NIFE, M20-01-1140 Date t.b.d.
<b>1.3 Sensory Neuroscience</b>	Prof. Andrej Kral	25 hours 3 CP	MHH NIFE, M20-01-1140 On request
<b>1.4 Imaging Methods in Medicine</b>	Prof.'in Lilli Geworski	25 hours 3 CP	MHH Building K7, floor S0, seminar room 1321 Date t.b.d.
<b>1.5 Psychophysical Methods in Hearing Research</b>	Prof. Andreas Büchner	15 hours 1,5 CP	MHH Seminar room "DHZ", Hannover Date t.b.d.
<b>1.6 Audio signal processing</b>	Prof. Waldo Nogueira	15 hours 1,5 CP	MHH Hannover Date t.b.d.
<b>1.7 Introduction to Neuroprosthetics</b>	Prof. Andrej Kral, Prof. Hannes Maier		
<b>1.8 Introduction to Biomaterials, Laser Spectroscopy and Microelectronics</b>	Prof. Andreas Heisterkamp, Prof. Holger Blume Prof.'in Cornelia Blume	25 hours 3 CP	LUH Date t.b.d.
<b>1.9 Fundamentals in Auditory Physiology</b>	Prof.'in Christine Köppl, Prof. Georg Klump	30 hours 3 CP	UOL Block course during SuSe
<b>1.10 Summer School and Internal Retreat</b>	N.N.	20 hours 2 CP	Summer 2023

## Elective courses at MHH:

Title	Instructor(s)	Credit	Time and place
<b>2.1 Nanotechnology in Medicine</b>	Prof. Theo Doll	12 hours 1 CP	MHH, NIFE On request
<b>2.2 Sound Coding Strategies and Signal Processing Methods for Cochlear Implants and Hearing Aids</b>	Prof. Waldo Nogueira	15 hours 1.5 CP	MHH On request
<b>2.3 Neural Signal Processing</b>	Prof. Waldo Nogueira	15 hours 1.5 CP	MHH On request
<b>2.4 Biomedical Technology</b>	PD Dr. Omid Majdani	10 hours 1 CP	MHH On request
<b>2.5 Medical Image Processing for Medical Applications</b>	PD Dr. Omid Majdani, Thomas Rau	12 hours 1-1.5 CP	MHH On request
<b>2.6 Modulation of Basal Ganglia Activity in Movement Disorders by Functional Neurosurgery</b>	Prof. Joachim Krauss	1.5 hours	MHH On request
<b>2.7 Animal Models for Psychiatric Disorders</b>	Prof. 'in Kerstin Schwabe	1.5 hours	MHH On request
<b>2.8 Auditory Plasticity</b>	Prof. Andrej Kral	25 hours 3 CP	MHH, NIFE On request
<b>2.9 Scientific Writing</b>	Prof. Andrej Kral	30 hours 3 CP	MHH, NIFE On request
<b>2.10 Statistical Approaches in Auditory Sciences</b>	Prof. Andrej Kral, Dr. Wiebke Konerding	10 hours 1 CP	MHH NIFE M20-01-1140 On request
<b>2.11 Lab Meeting Otolaryngology</b>	N.N.	1 hour / meeting	MHH NIFE, M20-S0-2520, Wed noon
<b>2.12 Journal Clubs</b>	Prof. Andrej Kral Prof. Waldo Nogueira	1 hour/ meeting	MHH
<b>2.13 Hearing(4all) Research Seminar</b>	N.N.	1 hour / meeting	MHH Place: t.b.a.; Contact: <a href="mailto:baumhoff.christine@mh-hannover.de">baumhoff.christine@mh-hannover.de</a>
<b>2.14 Colloquium Medical Physics</b>	Prof. 'in Lilli Geworski	1 hour / meeting	MHH, building K7, floor S0, seminar room 1321 Every second Tue 3–4 pm Registration required!

<b>2.15 Lunch seminar Radiology</b>	Prof. 'in Lilli Geworski	1 hour / meeting	MHH Radiology Wed 12–1 pm Registration required!
<b>2.16 Colloquium Radiology</b>	Prof. 'in Lilli Geworski	1 hour / meeting	MHH Radiology Tue 8:15–9:00 am Registration required!
<b>2.17 Audio Signal Processing for Cochlear Implants and Hearing Aids in Python</b>	Prof. Waldo Nogueira	15 hours 2 CP	MHH, NIFE On request

### Elective courses at LUH:



Title	Instructor(s)	Credit	Time and place
<b>2.18 Basics of Digital Systems</b>	Prof. Holger Blume	12 hours 1 CP	LUH / IMS Seminar room 335 Appelstr. 4, 3 <sup>rd</sup> floor On request

## Elective courses at UOL:

Title	Instructor(s)	Credit	Time and place
<b>2.19 Aktuelle Themen der Akustik, Signalverarbeitung und Medizinischen Physik</b>	Prof. Simon Doclo, Prof. Volker Hohmann, Prof. Birger Kollmeier, Prof. Steven van de Par	25 hours 3 CP	UOL Tue 2:15–3:45 pm
<b>2.20 Oberseminar Signal- und Sprachverarbeitung</b>	Prof. Simon Doclo	25 hours 3 CP	UOL Mon 10:15–11:45 am
<b>2.21 Oberseminar Medizinische Physik</b>	Prof. Birger Kollmeier	25 hours 3 CP	UOL Tue 10:15–11:45 am
<b>2.22 Psychophysik und Audiologie</b>	Prof. Birger Kollmeier, Prof. Steven van de Par, Dr. Stephan Ewert	50 hours 6 CP	UOL WiSe: Tue 8:15–9:45 am & Fri 8:15–9:45 am
<b>2.23 Advanced Topics of Speech and Audio Processing</b>	Prof. Simon Doclo	25 hours 3 CP	UOL WiSe: Mon 2:15–3:45 pm & Thu 10:15–11:45 pm
<b>2.24 Clinical Neuropsychology</b>	Prof. Stefan Debener	25 hours 3 CP	UOL WiSe: Tue 8:15–9:45 am
<b>2.25 Sprachverarbeitung</b>	Prof. Bernd Meyer	25 hours 3 CP	UOL SuSe: Wed 2:15–3:45 pm
<b>2.26 Digital Signal Processing</b>	Prof. Simon Doclo	50 hours 6 CP	UOL SuSe: Mon 4:15–5:45 pm & Wed 12:15–1:45 pm
<b>2.27 Neurophysik (Neurokognition)</b>	Prof. Volker Hohmann, Dr. Stefan Uppenkamp	25 hours 3 CP	UOL SuSe: Tue 4:15–5:45 pm
<b>2.28 Akustik</b>	Prof. Steven van de Par, Prof. Birger Kollmeier, Dr. Stephan Ewert	50 hours 6 CP	UOL SuSe: Tue 4:15–5:45 pm & Fri 8:15–9:45 am

## Combined electives:

<b>2.29 Combined Hot Topic Seminar (Web Conference)</b>	Dr. Christine Baumhoff, Dr. Mark Pottek	1 h / seminar	MHH/UOL/LUH Dates t.b.a.
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## PhD Program “Epidemiology”

Module*	Type	Dates 2023/2024**	Duration/TUs***	Organizer/Lecturers
Journal Club	Presentations by students	Monthly	Regular attention and one own presentation required (1 TU per meeting)	PhD Students
R Coding Club	Presentations by students and postdocs	Monthly	Regular attention and one own presentation required (1 TU per meeting)	PhD Students
Science Club	Presentations by students and postdocs	Monthly	Regular attention and one own presentation required (1 TU per meeting)	Carolina Klett-Tammen Juliane Dörrbecker
Introduction to Infectious Disease Epidemiology	Lectures and exercises	Nov. 2023	2 days (16 TUs)	Berit Lange John Nyirenda Manuela Harries
Basics of Infectious Diseases		Nov. 2023	2 days (16 TUs)	Olga Hovardovska Torben Heinsohn Monika Strengert
Basic Concepts of Probability and Statistics		Nov. 2023	2 days (16 TUs)	Bernard Silenou Henrik Schanze
Good Epidemiological Practice (GEP)		Nov./Dec. 2023	1 day (8 TUs)	John Nyirenda Carolina Klett-Tammen
Introduction Stata/R/Python		Dec. 2023	2 days (16 TUs)	Bernard Silenou Henrik Schanze
Regression Models		Jan./Feb. 2024	3 days (24 TUs)	Bernard Silenou Henrik Schanze
Survival Analysis		Jan. 2024	3 days (24 TUs)	Annette Möller Berit Lange Carolina Klett-Tammen
Introduction to Modelling		Feb. 2024	3 days (24 TUs)	Isti Rodiah
Systematic Reviews und Metaanalysis		March 2024	5 days (40 TUs)	Berit Lange Torben Heinsohn John Nyirenda
Empirical Methods		May 2024	3 days (24 TUs)	Carolina Klett-Tammen Tina Barohn

<b>Module*</b>	<b>Type</b>	<b>Dates 2023/2024**</b>	<b>Duration/TUs***</b>	<b>Organizer/Lecturers</b>
Data Protection and Ethical Aspects of Science		Spring 2024	1 day (8 TUs)	Anja Hauri Stefanie Castell Bernard Silenou
Machine Learning		Spring 2024	1 day (8 TUs)	Frank Klawonn
Outbreak & Surveillance Investigations		June 2024	1 week (40 TUs)	Berit Lange Anja Hauri Manuela Harries Bernard Silenou

\* Teaching modules in the PhD Programme “Epidemiology” are usually organized as compact courses.

\*\* Additional modules or courses may take place, depending on capacity and need.

\*\*\* TU=Teaching Unit (à 45 min)

Students enrolled in the PhD Programme “Epidemiology” and conducting their research work at the HZI are offered to attend courses and symposia organized by the HZI Graduate School.

Students of the PhD Programme “Epidemiology” are encouraged to attend courses at institutes of the MHH and of the HBRS at the MHH. Teaching units are accredited after consulting with the coordinating team and in line with the requirements of the programme.

The annual PhD retreat of the Programme “Epidemiology” is taking place annually in Braunschweig; the next meeting is scheduled for Summer 2024.



## Biomedical Data Science

### Curriculum Winter and Summer Semester 2023/2024

The BIOMEDAS curriculum builds upon the fields of:

- Computer Science: discipline of formalisms and scalable algorithmic processes;
- Data Science: discipline for discovering intrinsic data properties, value, and actionable insights;
- Open Science: field for enabling access to research outcomes; and
- Biomedicine: area that combines natural sciences, especially the biological and physiological sciences, to clinical medicine

and thus, offers a multidisciplinary curriculum to train data scientists with the required skills to address the challenges of transforming biomedical data into actionable knowledge that will support the discovery and interpretation of insights in biomedicine.

Depicted program modules below develop the required skills using mathematical and computational models to draw reliable conclusions from biomedical data. The accompanying program provides efficient further qualification.

Information given as of Sept 2023.

The actual curriculum can be viewed [here](#) at any time:



In case of questions, please contact the BIOMEDAS office: [biomedas@translationsallianz.de](mailto:biomedas@translationsallianz.de)

### Program modules

The program modules group into four clusters (Biomedical Science, Computational Method Development, Machine Learning and Data Mining, Interdisciplinary) and consists of lecture series and related methodological courses.

### **Journal Club and Progress Seminar**

<b>Title</b>	<b>Lecturer/Organizer</b>	<b>Duration/Credit</b>	<b>Time/Place</b>
BIOMEDAS Journal Club	BIOMEDAS students	45 min/bi-weekly	tba/web-based
BIOMEDAS Progress Seminar	BIOMEDAS students	45 min/bi-weekly	tba/web-based

### **Annual Retreat**

The annual PhD retreat of the Program BIOMEDAS is taking place annually. More information to follow.

### **Soft Skill Courses**

Please refer to the courses offered via the HBRS.

### **Alternative Courses**

Students enrolled in BIOMEDAS are encouraged to attend courses with relevant content from other graduate programs or university lectures of partner institutions. Hours of lessons can be accredited after consulting with the thesis committee and in line with the requirements of the program.

## **Specific seminars and practicals**

(see special announcements provided by the HBRS office, program offices and the respective departments)

### **Organised by the HBRS Office:**

*Presentation of projects / retreat (weekend, 2 days; for MD / PhD MM: 7<sup>th</sup> / 8<sup>th</sup> March 2024)*

*Gene Technology Security (September 2024, in English)*

*Translation workshop (Drug development, Patenting, Clinical Studies etc.: TBA)*

*Career Day (March 22<sup>nd</sup>, 2024)*

*GMP / GLP workshop (Spring 2024, Gerdemann, Pägelow and Papamichael, ITEM)*

*Scientific communication / writing, "tips and tricks" (January 19<sup>th</sup>, 2024, Kruse)*

*Animal Experiments (2 days theory: November 6<sup>th</sup> and 7<sup>th</sup>, 2023; exam November 23<sup>rd</sup>, 2023)*

*2-day practical courses: December 2023/January 2024, Bleich / Dorsch)*

*Conflict Management (November 15<sup>th</sup> and November 22<sup>nd</sup>, 2023; Pfeiffer / Golin)*

*Stress Management (TBA, 2024, G. Kümmele)*

*Time Management (January 9<sup>th</sup> and 24<sup>th</sup>, 2024, Golin)*

*Team Work and Leadership (March 13<sup>th</sup>, 2024, Golin)*

*Intercultural communication (June / July 2024; A. Petersen, Aachen)*

*Seminars on career perspectives (continuously)*

*Bioinformatics: TBA (Chouvarine, DeLuca)*

**Further courses:** *Career Coaching, Project Management, Team Leadership, Presentation workshops (German and English), Weekend Workshop German Culture etc. will be announced in course of the year.*

**Seminars offered by Helmholtz Centre for Infection Research Braunschweig, TWINCORE, Fraunhofer Institute or TiHo: see announcements**

### **Lectures (see special announcements and websites)**

#### **Interdisciplinary**

- Seminars of the SFBs
- Seminars of Clusters of Excellence"
- Immunological Colloquium
- Gastroenterology Colloquium
- Microbiological Colloquium, Virological Colloquium

#### **In the departments (a must!!)**

- Lab-Seminars
- Journal-Clubs

(these should be in English!)

**Internal practical courses**

The supervisors will provide you with special practical trainings if needed. You might also ask your co-supervisors or fellow PhD students for help.

Program offices and HBRS will offer a number of short practical courses (see announcements).

**German Classes**

Tuesdays: 3.30 - 5.00 pm (beginners, Mrs Anna Kiefer), seminar room 1031 (J4, level 01);

Tuesdays: 5.15 - 6.45 pm (advanced A2, Mrs Anna Kiefer); seminar room 1031 (J4, level 01)

**English conversation and language skills**

Tuesdays: 5.00 pm - 6.15 pm (Ms Lidia Lange), HBRS seminar room 1140 (J4, level 01)

**Optional**

Note: You are welcome to visit most of the seminars / courses organised for the German Biology and Biochemistry students, as well as medical students. You are also welcome to visit seminars / courses offered by all programs of HBRS [including the Graduate School at the University of Veterinary Medicine Hannover (TiHo)].

<http://www.mhh.de/hbrs>

<http://www.helmholtz-hzi.de>

## **Rules and Requirements for Postgraduate (PhD) Studies and Examinations in structured doctoral programs of Hannover Biomedical Research School (HBRS), Hannover Medical School**

On December 15<sup>th</sup>, 2000 the Senate of the Hannover Medical School approved the following **Rules and Requirements for Postgraduate (PhD) Studies and Examinations in structured doctoral programs of Hannover Biomedical Research School (HBRS)** [alternatively Dr. rer. nat.]. (*Modifications on June 4<sup>th</sup> 2002, February 11<sup>th</sup> 2004, April 21<sup>st</sup> 2005, March 14<sup>th</sup> 2007, April 15<sup>th</sup> 2009, November 9<sup>th</sup> 2011, November 14<sup>th</sup> 2012, June 18<sup>th</sup> 2014, May 11<sup>th</sup>, 2016, February 1<sup>st</sup>, 2017, October 17<sup>th</sup>, 2018, January 15<sup>th</sup>, 2020 and November 9<sup>th</sup>, 2022*)

### **§ 1**

#### **Objective of PhD Studies**

Research studies at the Hannover Medical School (MHH) for the purpose of obtaining a PhD or Dr. rer. nat. degree (hereinafter referred to as PhD studies) shall facilitate postgraduate training with a focus on specific research projects with a view to enabling the candidate to do in-depth scientific work on his or her own and to provide him or her with additional professional qualifications for future assignments in research or related areas of work. PhD studies shall foster the development of outstandingly gifted up-and-coming academics. The standard time allowed for completing PhD studies shall be three years. Once these PhD studies have been successfully completed, and the PhD examination has been passed, the MHH will award the degree of a Doctor of Philosophy (PhD) to medical students (including dentists), veterinarians, pharmacists, engineers, life scientists, and graduates with biomedical or health science related focus or Dr. rer. nat. to natural and life scientists and pharmacists (not to medical students).

### **§ 2**

#### **Requirements for Access and Admission**

(1) Anybody having successfully completed university studies in medicine, veterinary medicine, engineering, pharmacy, natural sciences or biomedical / health science focus (normally Master, Diploma or Staatsexamen / MBBS) shall have access to PhD studies.

(2) Applicants are required to render evidence of above-average results obtained at university. The applicant's past career must reveal his or her particular qualification for and dedication to scientific work. Decision on whether or not a candidate qualifies for access to PhD studies is up to the PhD Program Committee (§ 4).

### **§ 3**

#### **Admission to PhD Studies**

(1) The number of applicants that can be admitted to PhD studies is limited; the number depends on the respective program. The respective PhD Program Committee shall select the applicants to be admitted (§ 4). As a rule, the President of the MHH will give notice of the date of commencement of PhD studies once a year.

(2) Details of the as a rule three-step selection process (written application, written test in home countries or selection by program committee, interview) are regulated in the respective program 'rules of admission'.

(3) Application papers shall be submitted to the chairperson of the PhD Program Committee. Details of current application procedures are described on the website of HBRS.

(4) On the basis of the results of the selection process, the PhD Program Committee shall decide on admission to PhD studies.

(5) At MHH, candidates are enrolled as PhD students for the whole duration of their PhD work. Matriculation is done at the beginning of studies (usually winter semester).

## § 4 PhD Program Committee

(1) The respective PhD Program Committee shall be responsible for the conduct of PhD studies according to the Rules and Requirements for postgraduate studies and examinations to obtain a PhD (Dr. rer. nat.) degree. In the PhD program Infection Biology / DEWIN the steering committee of the Centre for Infection Biology (ZIB) is acting as PhD program committee.

(2) As a rule, the PhD Program Committee shall be composed of four professors (or competent habilitated/senior scientists), a university scientist with a doctoral degree, and student representatives of every study year who have a joint vote. Students suggest on person from every batch to act as “class-speaker”. Members of the PhD Program Committee shall be appointed by the scientists of a respective program for a period of four years, or two years in case of student members. Re-election shall be possible. The respective PhD Program Committee shall be affirmed by the Research Committee of MHH. The PhD Program Committee is then constituted by the Dean of HBRS and shall elect a professor from among its ranks as chairman. The steering committee of ZIB is elected by its members. The steering committee then appoints a speaker among their ranks.

(3) The PhD Program Committee will meet regularly.

(4) The PhD Program Committee will evaluate proposed projects (open projects) according to quality (with external referees if necessary), financial support, guarantee of independence for PhD students.

(5) The PhD Program Committee shall appoint a team of co-supervisors (thesis advisory board) for each PhD student. Team members shall be habilitated or equally qualified. The team of co-supervisors shall be composed of the student’s personal supervisor at the MHH or partner institutes, and two further scientists qualified as university teachers whose professional activity shall be closely related to the subject of the project. Members of the thesis advisory board usually come from different departments/institutes. In case of several PhD students doing research in the same line, the respective co-supervisors’ teams can be composed of the same individuals.

## § 5 Contents of Studies

(1) The contents to be learned shall be conveyed to the students through their experimental or equivalent theoretical research work and through project-related as well as inter-disciplinary research-oriented courses and seminars. For that purpose, the PhD Program Committee shall prepare and submit, after consultation with the university institutions or partner institutes involved in these studies, a curriculum indicating compulsory and recommended courses or seminars for each discipline.

The courses and seminars shall be held by the teachers and professors of the MHH as well as partner institutes, including visiting professors. Teaching shall be in English. Lectures and seminars of different programs are mutually acknowledged. PhD students may also register for suitable courses or seminars offered by other scientific schools (Leibniz University, University of Veterinary Medicine, etc.). Students are encouraged to do active teaching themselves, e. g. by giving lectures at seminars or postgraduate research training programs [Doktorandenkolleg]. PhD students independently maintain a study book, in which all training activities and presentations are documented. Each student’s individual progress at PhD courses and seminars shall be monitored by the respective teachers (by signatures in study books).

(2) PhD students shall design, after consultation concert with their co-supervisors, their respective individual schedules pursuant to the curriculum established by the PhD Program Committee. Such individual schedule shall require approval by the respective co-supervisors’ team. The student must complete a minimum of 300 hours at courses and seminars during his or her PhD studies; as a rule, at least 80% thereof must be taken at project-related courses and seminars and up to 20% may be spent on interdisciplinary learning (e. g. experimental techniques and bio-informatics, molecular biology, bio-statistics, scientific communication etc.).

During the first year of PhD studies, courses for physicians, dentists and veterinarians are intended to provide participants with a chance to consolidate their knowledge of the fundamental principles of natural sciences and courses for natural scientists are intended to consolidate their knowledge in medical aspects.



(3) PhD students could apply for a leave if justified (e. g. in case of pregnancy), but for no more than 12 months. Short time stays abroad are very much appreciated and will be supported. If students take seminars and courses abroad, they could be acknowledged for the respective PhD program.

## § 6 Supervision

(1) PhD students shall supervised by the members of their respective thesis advisory board (§ 4) appointed by the PhD Program Committee. The responsibilities of the team shall be:

- a) To act as co-supervisors and to give individual expert advice to PhD students all through their PhD studies.
- b) Within the scope of their research project, students have to work with appropriate methods on a clearly defined subject so that, with some realistic prospect of success, scientific knowledge can be expected to be incremented and the results of such research should be published in international peer-review journals. The co-supervisors shall make sure, and satisfy the PhD Program Committee to that effect, that students are not entrusted with any tasks unrelated to their PhD studies.
- c) To evaluate PhD students' progress during their studies by receiving their reports (annually) and conducting exams; and to assess their written final examination papers. The thesis advisory board meeting is conducted at least once a year. It is documented by a written protocol.
- d) Within a time of probation of 6 months from start of the PhD project, PhD students have to prove themselves and are evaluated mainly by the main supervisors. Within this time period, student status can be changed easily on both sides in agreement with the team of co-supervisors and PhD Program Committee. Upon request, the PhD Program Committee can decide about the termination of collaboration with the student.  
The termination of collaboration after the time of probation requires first a moderated discussion by a member of the PhD Program Committee between the student and the respective thesis advisory board. A student member of the PhD Program Committee is allowed to join as well. Afterwards, the PhD Program Committee announces their recommendations.

(2) The supervisors shall be responsible for the financing of the respective research project and shall make efforts, during the standard period of PhD studies (three years), to raise the money needed for the PhD students they are in charge of. Any scholarships available at the MHH shall be awarded or distributed to the individual PhD programs by resolution of the HBRS Committee of MHH.

(3) (Co-)supervisors should assist PhD students in planning their further professional career.

(4) The responsibilities of (co-)supervisors for PhD students shall end upon the date when the latter pass their PhD examination (§ 10), which is normally three years but no later than five years after commencement of PhD studies. The duration of PhD could only be extended in exceptional cases for a maximum of one year. Reasons could be: a) intermittent medical training (specialization) by medical students during their PhD studies, b) prolonged parental leave or c) serious illness.

## § 7 Scientific Colloquia (retreats)

(1) PhD students shall be invited annually by the PhD Program Committee to attend a public colloquium (retreat), giving them an opportunity to give an oral or poster presentation on the current status of their research (§5). The contents of such presentation, constituting an interim / project report, shall be submitted in writing by the PhD student to the PhD Program Committee.

(2) The PhD Program Committee shall decide whether or not this progress report constitutes a sufficient step towards the successful completion of the student's research. If the Committee's comment is negative, such result shall be communicated in writing to the student and his or her co-supervisors' team, indicating the reasons.

(3) Pursuant to a period of one month, the student shall submit a modified work plan for the next year of his research, giving due consideration to the recommendations made.

## § 8 Intermediate Examination

(1) The oral intermediate examination shall be held no later than 18 months after commencement of PhD studies. By way of exception, which must be well-founded, the intermediate examination can be taken at a later date. If a student wishes such exception, he shall apply in writing to the PhD Program Committee adding a comment prepared by his co-supervisors' team.

(2) The dates for intermediate examinations shall be determined by the PhD Program Committee. The intermediate examination shall be held by an expert in the special field and an additional member of the HBRS faculty (chairman). These two examiners are elected by the PhD Program committee. The exam shall cover topics from the student's research project and from the courses and seminars the student has registered for. The examination usually is held in English.

(3) The following grades are given: excellent / very good / good / sufficient/ failed

(4) If the student fails the intermediate examination he shall be allowed to retake it once, pursuant to a period of at least three and no more than six months as the examiners may decide. If the student fails again, he or she shall be deemed to have finally and absolutely failed. Following such final and absolute failure the student shall be taken off the register.

(5) The "chairman" shall report the result of the intermediate examination to the PhD Program Committee. The result of the exam will account for 20% of the final grade (PhD or Dr. rer. nat.).

## § 9 Requirements for Signing up for PhD Examination

(1) After completion of PhD studies, which is normally at the end of the third year, the PhD examination shall be held. The PhD student shall submit the following documents when signing up for the PhD examination:

- a) Certificate of regular attendance at and completion of courses and seminars according to the curriculum, i.e. a total of at least 300 hours, and of three colloquia pursuant to § 7;
- b) Certificate of attendance of a course on "good scientific practise",
- c) Certificate of intermediate examination;

- d). A scientific thesis (dissertation) prepared as a Monograph in English or German by the PhD student on the research project the student worked on during his or her PhD studies, with introduction, materials and methods, results, discussion and summary. The thesis shall constitute an essential original scientific contribution to the discipline the student's research project pertains to;
- e) Alternatively (instead of a Monograph), usually two first author publications in internationally peer reviewed science journals (published or accepted) as a cumulative thesis. Shared first authorships are allowed. The PhD student's personal contribution to such publications shall be clearly identified as well as the contribution of the other authors. In that context, "accepted" shall be deemed equivalent to "published". As for this publication requirement, exceptions are possible with reasons to be given by the supervisor.  
The publications must be in one scientific context, and shall be supplemented by a newly composed, detailed description under a joint title in English or German of the research subject, including an overall summary and a discussion of results. Hereby, current literature shall be considered.
- f) A written agreement to a potential screening of the thesis with plagiarism detection software (appendix 1).

(2) The final version of the dissertation should be submitted in six printed copies as well as a digital version (appendix 2).

(3) Before evaluation by the internal/external examiners, the dissertation can be checked for the agreement with the MHH guideline on "good" scientific practice". This includes the screening of primary data as well as screening for plagiarism. In case of suspicion of scientific fraud, the dissertation is passed on to an ombudsman, who can initiate proceedings according to the guidelines on „good scientific practise". During the ombudsman proceedings, the PhD process is paused.

(4) The registration for the PhD examination (the submission of the PhD thesis) can be withheld after the PhD student had announced this to the PhD committee in written form. The PhD program committee informs the office of president.

(5) To assess the thesis, the PhD Program Committee shall procure at least two independent expert opinions. Usually there is one external expert's opinion, as well as one internal expert's opinion. Experts are experienced researchers with a habilitation (or equivalent qualification). The external expert shall not be a member of MHH or HBRS faculty. The internal expert is not a member of the thesis advisory board. To be on the safe side, one expert shall be nominated as substitute in case of unforeseen drop outs. For the Dr. rer. nat., at least one of the experts (internal or external) has to have a natural scientist qualification. In addition, the co-supervisors' team shall prepare an expert report on the dissertation, and such report together with the external and internal expert's opinion shall serve to make the final assessment. The following grades can be given in the reports:

excellent / very good / good / sufficient / failed

or

ausgezeichnet / summa cum laude,

sehr gut / magna cum laude,

gut / cum laude,

genügend / rite,

nicht bestanden / non sufficient

All three reports are considered equally for the final assessment, together 60% for the final mark.

(6) If one of the expert reports detects any shortcomings in the dissertation, the PhD Program Committee can be requested to have such shortcomings eliminated or remedied as a precondition for acceptance of the thesis. The chairperson can allow a reasonable period for the PhD candidate to remedy the shortcomings and recommend that he or she submit the thesis anew. In that respect, the chairperson of the PhD Program Committee can extend this period once only. The experts or the thesis advisory board shall assess the thesis again once the shortcomings have been remedied.

(7) If, based on such second experts' vote, the PhD Program Committee declines to accept the thesis, the candidate shall be deemed to have failed the PhD examination finally and absolutely. In that case, the PhD student shall be taken off the register.

## § 10 PhD Examination

(1) The PhD examination consists of a public presentation (usually 15-20 min, in English) held by the PhD student at the Hannover Medical School on the subject of his research, a subsequent public disputation of the project of at least 30 minutes of duration to assess the knowledge acquired by the student on the subject of his specific area of research as well as on interdisciplinary subjects. The interview also serves to assess whether the candidate has acquired, and is able to apply, any knowledge and skills relating to the scientific environment of the subject of his research.

(2) The examination is taken by an examination board: the external and internal examiner as well as a member of the PhD Program Committee (with PhD degree) who acts as chairman.

(3) The final grade results from: the intermediate exam (20%), the written reports of dissertation by thesis advisory board/ the two experts' opinions (60%), the oral examination (20%). In justified exceptional cases, the examination committee may deviate from the latter rule.

(4) The oral examination shall be taken on record in abridged form and shall indicate:

A short summary of the examination content  
the grade earned for the intermediate examination  
the grade earned for the thesis (three independent written reports),  
the grade earned for the oral examination,  
the overall grade average earned for the PhD examination.

It shall be signed by the chairman of the board of examiners.

(5) The following grades can be awarded:

Excellent/ very good/ good / sufficient / failed

Equivalent to  
ausgezeichnet / summa cum laude,  
sehr gut / magna cum laude,  
gut / cum laude,  
genügend / rite,  
nicht bestanden / non sufficient

The overall grade „excellent - summa cum laude” is usually awarded only if at least one first-author manuscript is accepted for publication. Shared first-authorships are considered equally.

(6) If the candidate fails the final examination, he or she shall be allowed to retake it once with the same board of examiners, pursuant to a period of at least three and no more than six months as the thesis advisory board may decide. Should the student then fail again, he or she shall be deemed to have finally and absolutely failed the PhD examination. Following such final and absolute failure the student shall be taken off the register.

(7) The result of the PhD examination shall be communicated to the PhD Program Committee and the President's office (in case of failure with reasons and instructions about a person's available legal remedies) as well as to all German universities.

## § 11 Publication

- (1) PhD students are obliged to publish their dissertation.
- (2) Once the student has passed the PhD examination, he or she has to distribute within one year six copies of the dissertation (plus one electronic version). In case of an online publication with the library, three final copies are sufficient. Formatting has to be done according to the rules of MHH library. The publication in form of a monograph is allowed if it is clearly indicated that the dissertation has been published by MHH.
- (3) If the deadline of one year is missed all rights acquired by the PhD exam are extinct.
- (4) The PhD student together with the supervisor can apply at the 'Forschungsdekanat' for a so called 'Hold of the dissertation for publication' in order to protect intellectual property or patent issues. This application form needs to be handed in at the library together with the copies of the dissertation. In case of discordance of student and supervisor, the president of MHH or a designated person will decide on granting a 'Hold'. All information concerning the hold needs to be protected from unwanted distribution by a written agreement on confidentiality, for example in an application process. The PhD office can certify that the obligatory copies of the dissertation had been handed in and that the electronic version matches the printed version.
- (5) In consequence, there is a delay in making the dissertation publicly available. The "Hold" can be applied for one year. It can be extended twice for another year upon request.
- (6) At the end of the "Hold", the library is automatically publishing the dissertation if there is no further application for extension.

## § 12 Award of the Academic Degree of a Doctor of Philosophy (PhD)

- (1) After successful PhD examination and distribution of six final printed copies and an electronic version, as well as a declaration that all documentation, electronic data, lab books and materials had been handed over in the respective department/institute, he or she shall be awarded the academic degree of a Doctor of Philosophy (PhD) or a Dr. rer. nat. degree by the MHH.
- (2) A document as shown in Appendix 3 and 4 shall be issued to him or her in evidence of such award. The award shall authorize the candidate to use the academic title of a PhD or Dr. rer.nat.

## § 13 Abrogation, invalidity and revocation of the doctorate

- (1) The examination board suspends the PhD examination procedure, if an investigative or criminal procedure concerning the doctorate is pending against the PhD student.
- (2) If the doctoral candidate is found to be guilty of a serious breach of good scientific practice or deception regarding the doctoral achievements or that there are no essential requirements for admission to the doctorate, the Senate declares upon suggestion of the president, the immediate termination of the procedure and the invalidation of the PhD work performed so far. In this case, it is not permitted to conduct a PhD again at the MHH.
- (3) If, after completion of the PhD, it turns out that the doctoral candidate committed a deception, threat or bribery during a doctoral thesis, the Senate can subsequently withdraw the doctoral degree after hearing the doctoral candidate. This applies in particular to deceptions about the circumstances mentioned in paragraph 2. If the doctoral degree is withdrawn, the president revokes the doctoral certificate and title. Paragraph 2 sentence 2 and paragraph 48 of the Administrative Procedure Act apply accordingly. Withdrawal affects the time of completion of the doctorate.

(4) The doctoral degree - including an honorary doctorate - can be withdrawn by the Senate, if the doctoral candidate has been legally sentenced to at least one year in prison for an intentional crime or if he or she has been legally sentenced for an intentional crime in its preparation and perpetration of the doctoral degree. Paragraph 48 of the Administrative Procedure Act applies accordingly.

## § 14 Coming into Effect

The Rules and Requirements for Postgraduate Studies and Examinations in structured doctoral programs of Hannover Biomedical Research School (HBRS) to obtain a PhD degree (or Dr. rer. nat.), as approved by the senate of MHH, are hereby published within the Hannover Medical School and are coming into effect.

Hannover,

The President  
Professor Dr. Michael P. Manns

### Appendix 1 Declaration

#### Declaration

Herewith, I confirm that I have written the present PhD thesis myself and independently, in compliance with “the policy of Hannover Medical School on the safeguarding of good scientific practice and procedural rules for dealing with scientific misconduct” and that I have not submitted it at any other university worldwide.

Herewith, I agree that MHH can check my thesis by plagiarism detection software as well as randomly check the primary data. I am aware that in case of suspicion, ombudsman proceedings according to § 9 of MHH 'Guidelines of Hannover Medical School to guarantee good scientific practice and dealing with scientific fraud' will be initiated. During such proceedings, the PhD process is paused.

Hannover, (Month Year)

Appendix 2. Front pages of thesis (example)TitleLogo of PhD Program

A thesis submitted for the degree of  
Doctor of Philosophy (PhD) [or Doctor of Natural Sciences (Dr. rer. nat.)]  
in the subject of XXX  
by  
First name last name, Degree (e. g. Master)  
Month Year

Hannover Medical School  
International PhD program “XXX”  
in Hannover Biomedical Research School (HBRS)  
Department of XXX

2<sup>nd</sup> pageAcknowledged by the PhD committee and head of Hannover Medical SchoolPresident: Prof. Dr. Michael P. MannsSupervisor:Co-supervisors:External expert:Internal expert:Day of final exam/public defense:

**Example of PhD certificate (According to § 11)**Appendix 3

(MHH Logo)

Die Medizinische Hochschule Hannover unter der Präsidentschaft der Professorin / des Professors  
Name Vorname verleiht

Frau / Herrn Name Vorname

geboren am TT. Monat JJJJ in Stadt, Land

den Grad einer /s

Doktorin / Doktor der Naturwissenschaften (Dr. rer. nat.)

bzw. Doctor of Philosophy (PhD)

nachdem sie / er im Rahmen der Hannover Biomedical Research School unter Teilnahme am PhD  
Programm

XXXX durch ihre / seine Dissertation

TITEL

angefertigt in der Abteilung, Institut, Einrichtung,  
sowie der öffentlichen Disputation der Arbeit ihre / seine Befähigung zu vertiefter selbstständiger  
wissenschaftlicher

Arbeit nachgewiesen und dabei das Gesamturteil

summa cum laude (exzellent) / magna cum laude (sehr gut) / cum laude (gut) / rite (genügend)

erhalten hat.

Hannover, den TT. Monat JJJJ

(Siegel)

Unterschrift

Unterschrift

Programmsprecher / in

Präsident / in der Medizinischen Hochschule Hannover

Appendix 4

(MHH Logo)

Hannover Medical School under its President Professor

confers upon

First name last name

Born on DD Month YYYY in town, country

the degree of

Doctor rerum naturalium (Dr. rer. nat.) / Doctor of Philosophy (PhD)

having participated in the PhD Program xxx within Hannover Biomedical Research School and having  
demonstrated the ability to undertake advanced independent research in his / her thesis

TITLE,

completed at the Institute of xx, Hannover Medical School, and a public defense of this thesis, which  
has been awarded the overall grade of

excellent (summa cum laude) / very good (magna cum laude) / good (cum laude) / sufficient (rite)

Hannover, DD Month YYYY

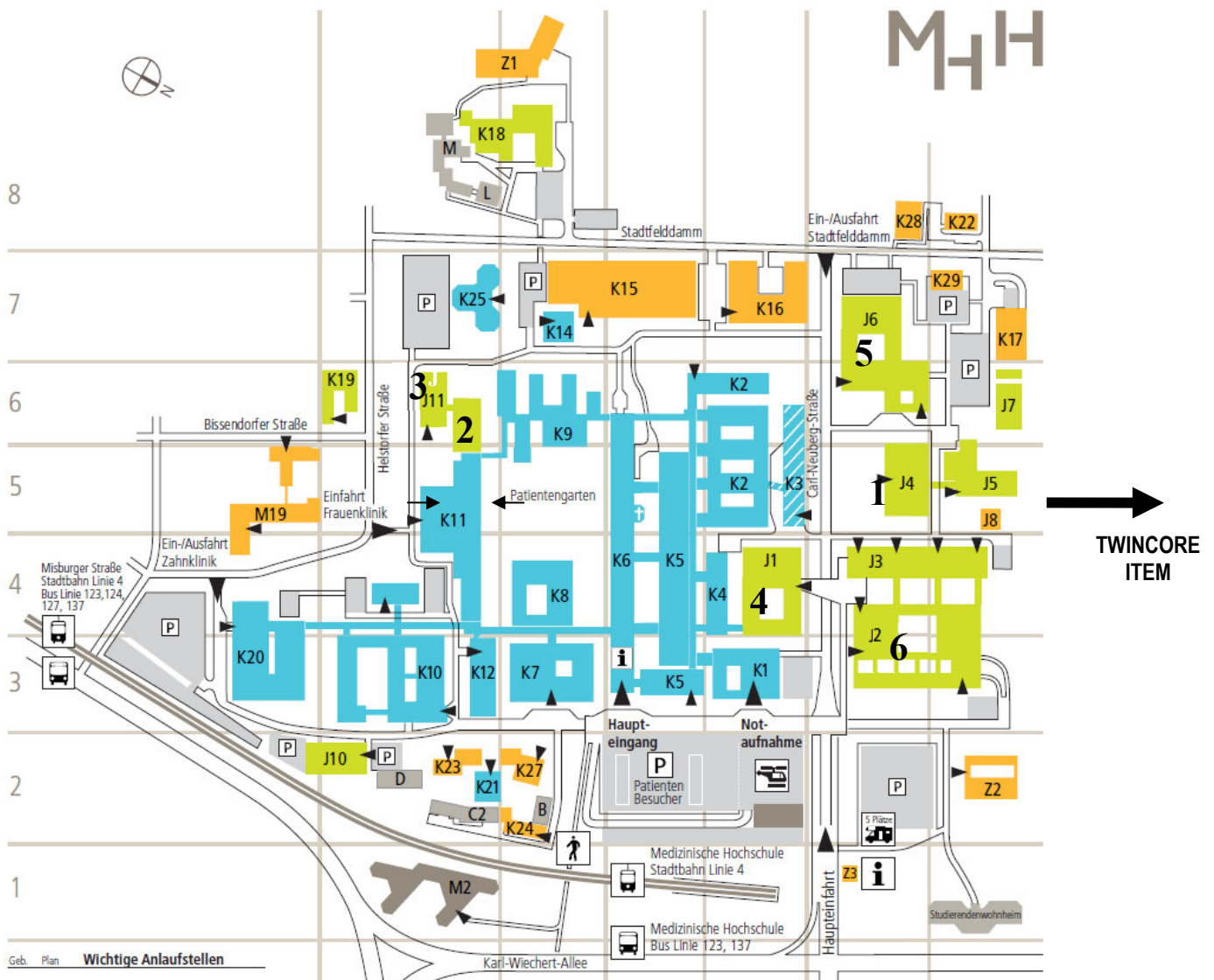
Signature

Chairman / woman PhD Program

Signature

President





**1: Building J4 (Forschungswerkstätten)**  
 MD/PhD/ HBRs Office; HBRs seminar room 1140; level 1  
 Seminar room 1031, level 01,  
 Seminar room S 1400 (ground floor),

**2: TPFZ Research building**  
 (for entrance see arrows)  
 PhD Infection Biology Office and DEWIN, level 2  
 Seminar room 1420, ground floor

**3: HBZ Building (Hans Borst Zentrum, J11)**  
 PhD Regenerative Science Office, level 2  
 Seminar room, ground floor

**4: Main lecture hall building (F-N), Library, registrar's office**

**5: Lecture halls Q, R**

**6: Lecture halls A - E**