Study Book

Graduate Study Program in Molecular Biology

Winter Semester 2019/20

Interdisciplinary education program for graduates of natural and life sciences, computer sciences as well as students of medicine and physicians

Medical Faculty of the University of Hamburg at the University Medical Center Hamburg-Eppendorf (UKE)

This study book gives a curriculum overview of the interdisciplinary graduate study program in molecular biology (ASMB) offered by the Medical Faculty of the University of Hamburg at the University Medical Center Hamburg-Eppendorf (UKE) in cooperation with the Departments Biology and Chemistry of the University of Hamburg.

1. General Information

Overview

ASMB offers education for graduates with a diploma/master or doctoral degree in natural or life sciences, engineering or computer sciences and for medical students/staff with an MD degree or an approved doctoral student position.

ASMB is a four-semester study program with lectures, literature seminars and research methods courses. The **working** language **including the examination** is English.

The weekly ASMB lectures given by experts cover four topics of molecular biology:

1st semester: Molecular biology methods in research and diagnostics
2nd semester: Protein analysis and cell biology methods in research and diagnostics
3rd semester: Neurobiological and immunological systems
4th semester: Molecular mechanisms of genetic neuro diseases.

In literature seminars tied to lecture topics, the ASMB students present and discuss scientific publications. Theory is put into practice through numerous hands-on research methods courses. ASMB students have to take a total of at least six research method courses.

In parallel to the theoretical study program, the students pursue a research project which can be done as part of a PhD/MD thesis or independent of that. The research work has to be presented at the beginning of the first and after the second semester. At the end of the fourth semester, the successful student has to hand in a short final report and to defend his/her research project in a final *viva voce* (oral examination).

The compulsory part of the ASMB Program comprises

- Attendance of the ASMB lectures
- Presentation of the research project, the progress report and the final presentation
- Presentation of at least two literature seminars
- Attendance of at least six research methods courses.

and can be complemented with seminars and workshops of further training in professional competence and non-disciplinary skills offered by the Medical Faculty and the Career Center of the University of Hamburg. **The students get certificates of attendance with the credit points awarded for all lectures, seminars and practical courses completed.**

Individual counselling of the students regarding their research project resp. doctoral theses is given by their supervisors. The doctoral degree is awarded by the different faculties according to their doctoral degree regulations (Dr. rer. nat., PhD or Dr. rer. biol. hum.).

After completion of the modular training program and the successful final presentation of their research project the students receive an ASMB certificate with credit points.

ASMB Coursework Requirements and Credit Points (CP)

	Interdisciplinary Courses	**Research Methods Courses**	**Academic Key Skills Courses**
Compulsory ASMB Courses	Visit of ASMB Lectures **5 CP per 4 semesters** Presentation of ASMB Literature Seminar **1 CP** Project Presentations **1 CP** Progress Reports **1 CP** Final Project Presentation **2 CP** Written final report **2 CP** **Requirement:** At least **11 CP**	Visit of ASMB Courses **1-2 CP** **Requirement:** At least **6 CP**	
Optional Courses	e.g. - Conference participation **1 CP** - Poster at conference **1 CP** - Conference talk **2 CP** - ZMNH & other seminars **1 CP for 10 seminars**	Visit of e.g. - UKE Core Facility workshop **1-2 CP** - Method seminars at the UKE **1-2 CP** - Equipment tutorials, external classes for learning a special lab technique **1 CP**	Visit of courses on e.g. - Good Scientific Practice **1 CP** - Writing skills **1 CP** - Presentation skills **1 CP** - Project management **1 CP** - Leadership skills **1 CP**

Entry Requirements

Graduates must have a diploma/master degree; medical students must have passed the first part of the state exam (Medicine I) and should have submitted their medical doctoral thesis when applying. ASMB students have to enrol at the University of Hamburg.

The application package includes

- Application form (available as download on the ZMNH homepage)
- Curriculum vitae
- Brief description of the research project to be pursued during the graduate program
- Research project supervisor's contact details
- Diplomas of all academic degrees and certificates of other relevant examinations or, for medical students, transcripts / academic records (Studienbuch) of studies*
- Optionally: copies of English proficiency certificates*

*regular (i.e. uncertified) copies are sufficient during the application process

ASMB Scientific coordinators at the Center for Molecular Neurobiology Hamburg (ZMNH)

- Prof. Dr. Dietmar Kuhl
Director of the ZMNH Institute for Molecular and Cellular Cognition

- Prof. Dr. Matthias Kneussel
Director of Center
Director of the institute of Molecular Neurogenetics

- Priv.-Doz. Dr. Sabine Hoffmeister-Ullerich
Head of the ZMNH Core facility Bioanalytics
Email: hoffmeis@uke.uni-hamburg.de

- Dr. Fabio Morellini
Head of Research Group Behavioral Biology
Email: fabio.morellini@zmnh.uni-hamburg.de

Contact:
Sabine Hoffmeister-Ullerich
Email: hoffmeis@uke.uni-hamburg.de
Phone: +49 40 7410-56662
Fax: +49 40 7410-55713
Or
info@zmnh.uni-hamburg.de
Phone: +49 (0) 40 7410 - 56271

2. Curriculum: Compulsory ASMB Modular Training Program

2.1. ASMB Interdisciplinary Lectures and Literature Seminars

2.1.1. ASMB Lecture Topics and Literature Seminars

1st Semester	Molecular Biology Methods in Research and Diagnostics
Module type	**Interdisciplinary ASMB lectures and seminars**
Responsible Lecturer	ASMB Academic Staff
Study objective	Basic and advanced knowledge about recent molecular biology methods
Length	Eight lectures on Thursdays from 9 a.m. to 11 a.m.
Literature	http://www.zmnh.uni-hamburg.de/teaching/asmb/literature.htm
Participants	All students and guests
Credit Points	1 for 8 lectures
Course description	Insights into latest developments in - enzymes as basic tools in molecular biology - cloning strategies - genome analysis - gene expression analysis - genetic engeneering - RNAi - Cell Cycle Control - Cell Differentiation - transgenic animals

2nd Semester	Protein Analysis and Cell Biology Methods in Research and Diagnostics
Module type	**Interdisciplinary ASMB lectures and seminars**
Responsible Lecturer	ASMB Academic Staff
Study objective	Basic and advanced knowledge about recent protein analysis and cell biology methods
Length	Nine lectures on Tuesdays from 9 a.m. to 11 a.m.
Literature	http://www.zmnh.uni-hamburg.de/teaching/asmb/literature.htm
Participants	All students and guests
Credit Points	1 for 8 lectures
Course description	Insights into latest developments in - statistics_I - statistics_II - Basic bioinformatics - protein synthesis and its regulation - antibodies, their generation and properties - advances in light microscopy for molecular and cellular biology - basic protein analysis - signalling via ion channels - epigenetics - G-protein coupled receptors - endocytosis, transport and degradation of proteins

3rd Semester	Neurobiological and Immunological Systems
Module type	**Interdisciplinary ASMB lectures and seminars**
Responsible Lecturer	ASMB Academic Staff
Study objective	Recent knowledge about neurobiological and immunological systems
Length	Twelve lectures on Tuesdays from 9 a.m. to 11 a.m.
Literature	http://www.zmnh.uni-hamburg.de/teaching/asmb/literature.htm
Participants	All students and guests
Credit Points	1 for 8 lectures
Course description	Insights into recent advances in neurobiology and immunology - introduction to neurobiology - neuronal excitability Reports fresh from the bench on* - neuronal development - distribution and localization of neuronal proteins - sensory systems - behavior - introduction: - overview on the immune response during infection - MHC and antigen-presentation - T cell responses - therapeutic manipulation of the immune system - tolerance and autoimmunity * topics vary depending on actual ongoing research projects

4th Semester	Molecular Mechanisms of Genetic Neurodiseases
Module type	**Interdisciplinary ASMB lectures and seminars**
Responsible Lecturer	ASMB Academic Staff
Study objective	Recent knowledge about molecular mechanisms of genetic neurodiseases
Length	Twelve lectures on Thursdays from 9 a.m. to 11 a.m.
Literature	http://www.zmnh.uni-hamburg.de/teaching/asmb/literature.htm
Participants	All students and guests
Credit Points	1 for 8 lectures
Course description	Insights into latest developments in - the evolution of disease gene identification approaches - ALS and related neurodegenerative diseases - bone diseases - Triplet Repeat diseases - MS - Immune regulation - stem cell technology for drug discovery and regenerative medicine - schizophrenia - diabetes I - Alzheimer - Morbus Parkinson - epilepsy - LQT-Syndrome

All Semesters	Literature seminars tied to the lecture topics
Module type	**Interdisciplinary ASMB literature seminars**
Responsible Lecturer	ASMB Academic Staff
Study objective	Interdisciplinary discussion of research results and improvement of presentation skills
Length	During the ASMB lectures
Literature	The respective papers are distributed before the seminar.
Participants	All students and guests
Credit Points	1 CP for presentation
Course description	Tied to lecture topics, students present and discuss scientific publications
Contact	The respective lecturer

2.1.2. ASMB Lecture Schedule – Winter Semester 2019/20

3rd Semester

Date	Lecture Topics	Lecturers
Oct. 15	Progress reports	As many as possible
Oct. 22	Progress reports	As many as possible
Oct. 29	*Introduction to neurobiology*	D. Kuhl
Nov. 05	*Neuronal excitability*	J. Schwarz
Fresh from the bench:		
Nov. 12	*Neuronal Development*	F. Calderon de Anda
Nov. 19	*Distribution and localization of neuronal proteins*	T. Hausrat
Nov. 26	*Synapses*	S. Wiegert
Dec. 03	*Sensory systems*	P. Šoba
Dec. 10	*Behavior*	F. Morellini
Dec.17	*Introduction: Overview on the immune response du infection*	B. Fleischer
Christmas break		
Jan. 07	*MHC and antigen-presentation*	B. Fleischer
Jan. 14	*T cell responses*	T. Jacobs
Jan. 21	*Therapeutic manipulation of the immune system*	B. Fleischer
Jan. 28	*Tolerance and Autoimmunity*	E. Tolosa

2.2. ASMB Students' Project Presentations

2.2.1. ASMB Students' Project Presentations

1st Semester	Students' presentations of their research projects
Module type	**Interdisciplinary ASMB seminars**
Responsible Lecturer	ASMB Coordinators
Study objective	Interdisciplinary discussion of research results and improvement of presentation skills
Length	Three to five seminars on Thursdays from 9:15 a.m. to 11 a.m.
Literature	-
Participants	All students and guests
Credit Points	1 CP for presentation
Course description	Students' 10-15 minute-talks on their research projects followed by discussion
Contact	Sabine Hoffmeister-Ullerich Email: hoffmeis@uke.uni-hamburg.de / info@zmnh.uni-hamburg.de

2nd Semester	Students' progress reports on their research projects
Module type	**Interdisciplinary ASMB seminars**
Responsible Lecturer	ASMB Coordinators
Study objective	Interdisciplinary discussion of research results and improvement of presentation skills
Length	Three to five seminars on Tuesdays from 9:15 a.m. to 11 a.m.
Literature	-
Participants	All students and guests
Credit Points	1 CP for presentation and attendance of all reports
Course description	Students' 10-15 minute-talks on their research projects followed by discussion
Contact	Sabine Hoffmeister-Ullerich Email: hoffmeis@uke.uni-hamburg.de/ info@zmnh.uni-hamburg.de

4th Semester	Students' final presentations of their research projects
Study Program	
Module type	**Interdisciplinary ASMB seminars**
Responsible Lecturer	ASMB Coordinators
Study objective	Interdisciplinary discussion of research results and improvement of presentation skills
Length	Two days from 9 a.m. to 5 p.m.
Literature	-
Participants	All students and guests
Credit Points	2 CP for final presentations and attendance of the 2-day symposium
Course description	Students' 20 minute-talks on their research projects followed by discussion
Contact	Sabine Hoffmeister-Ullerich Email: hoffmeis@uke.uni-hamburg.de / info@zmnh.uni-hamburg.de

2.2.2. ASMB Project Presentations – Winter Semester 2019/20

3rd Semester

Date	Topic
Oct. 15	Progress reports
Oct. 22	Progress reports

2.3. ASMB Research Methods Courses - Winter Semester 2019/20

1. *In utero* electroporation	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Froylan Calderon de Anda
Length	1-2 days
No. of participants	Max. 3
Credit Points	1
Course description	In utero transfection of neural-precursor cells of the rodent parietal cortex and their progeny *in vivo.*
Contact	froylan.calderon@zmnh.uni-hamburg.de

2. Cell cycle analysis	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Jean Pierre David
Length	1-2 days
No. of participants	Max. 3
Credit Points	2
Course description	Characterization of cell proliferation and of agents that either promote or retard cell proliferation.
Contact	j.david@uke.de

3. Introduction to differential separation of organelles by ultracentrifugation and sucrose gradient	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Berta Puig-Martorell
Length	3 days
No. of participants	Max. 3
Credit Points	2
Course description	Preparation of organelles, e.g. synaptosomes, by ultracentrifugation and sucrose gradient
Contact	b.puig-martorell@uke.de

4. Translational Control Assays *in vivo* and *in vitro*	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Kent Duncan
Length	3 days
No. of participants	Max. 4
Credit Points	2
Course description	Translational control assays including: - Polysome profiling - Cell-based reporter assays for translation - Reporter mRNA synthesis - In vitro translation systems - Measuring translational output in the luminometer
Contact	kent.duncan@zmnh.uni-hamburg.de

5. Figure design using Adobe Illustrator	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Dr. Jan Broder Engler
Length	1 day
No. of participants	Max. 3
Credit Points	1
Course description	This course will introduce you to the basics of graphic design and illustration with Adobe Illustrator, with a focus on creating poster presentations.
Contact	jan-broder.engler@zmnh.uni-hamburg.de

6. Immunhistochemistry of brain and spinal cord	
Module type	**ASMB research method course**
Responsible Lecturer	Prof. Dr. Manuel Friese
Length	2 days
No. of participants	Max.
Credit Points	2
Course description	Immunohistochemistry of brain and spinal cord (quantification of inflammation and axonal injury)
Contact	manuel.friese@zmnh.uni-hamburg.de, benjamin.schattling@zmnh.uni-hamburg.de

7. Differential centrifugation for separation and localization of soluble and aggregated proteins	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Giovanna Galliciotti
Length	3 days
No. of participants	Max. 2
Credit Points	2
Course description	Different techniques for separating proteins; separation of soluble proteins from insoluble cellular material by differential centrifugation….
Contact	g.galliciotti@uke.de

8. Patch clamp recordings	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Christine Gee
Length	2 days
No. of participants	Max. 2
Credit Points	2
Course description	Patch clamp recordings using a glass micropipette as electrode with an open tip enclosing a membrane surface to study ion channels under different conditions.
Contact	christine.gee@zmnh.uni-hamburg.de

9. *In vivo* recording of cortical activity in newborn rats	
Module type	**ASMB research method course**
Responsible Lecturer	Prof. Dr. Ileana Hanganu-Opatz
Length	2-3 days
Participants	Max. 3
Prerequisites	Interest in electrophysiology
Credit Points	2
Course description	This class will give an overview on: - handling/anesthesia of neonatal rats - preparation of rat pups for acute in vivo recordings of cortical activity (demonstration) - extra- and intracellular recordings of the cortical activity in anesthetized and awake rat pups - correlation between early activity and development of cognitive abilities
Contact	ileana.hanganu-opatz@zmnh.uni-hamburg.de

10. Primary neuron culture, neuron transfection and immunocytochemistry (ICC)	
Module type	**ASMB research method course**
Responsible Lecturer	Prof. Dr. Hans-Jürgen Kreienkamp, Fatemeh Hassani Nia
Length	2 days
No. of participants	Max. 2
Credit Points	1
Course description	The class will give a practical introduction in the generation of primary cell cultures from mouse brains, their transfection and characterization by immunocytochemistry
Contact	f.hassani-nia@uke.de

11. Analysis of protein-protein interactions, GST-Pulldown, Western Blotting	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Frank Heisler, Dr. Torben Hausrat
Length	3-4 days
Literature	A script will be available one week before the course starts
Participants	Max. 4
Credit Points	2
Course description	The class will give a practical introduction in the analysis of protein-protein interactions in neuronal and non-neuronal systems using GST-pulldown assays, immunoprecipitation and immunocytochemistry.
Contact	frank.heisler@zmnh.uni-hamburg.de, torben.hausrat@zmnh.uni-hamburg.de

12. Transgenic mice	
Module type	**ASMB research method course**
Responsible Lecturer	PD Dr. Irm Hermans-Borgmeyer
Length	

Participants	Max. 4
Credit Points	2
Course description	Transgenic mice: an introduction to the techniques, duration depends on what you want to learn. (Only for people who don`t have contact to "dirty" mice or other rodents and can afford to keep away from this animals three days before the course starts.)
Contact	hermans@zmnh.uni-hamburg.de

13. Introduction to cell culture, generation of stable transfected cells, Internalization assay	
Module type	**ASMB research method course**
Responsible Lecturer	PD Dr. Guido Hermey
Length	2-4 days
Participants	Max. 3
Credit Points	2
Course description	The course will give a theoretical and practical introduction to different cell culture techniques. Two experiments will be performed. Cells will be transfected and selected to generate stably transfected cell lines. Internalization of surface receptors will be analyzed by an antibody feeding assay.
Contact	guido.hermey@zmnh.uni-hamburg.de

14. Real-time PCR	
Module type	**ASMB research method course**
Responsible Lecturer	PD Dr. Sabine Hoffmeister-Ullerich
Length	2 -3 days
Literature	Script, Clinical Chemistry 55:4, 611–622 (2009)
Participants	Max. 3
Credit Points	1
Course description	This course will give an introduction into the mechanisms and pitfalls of real time PCR
Contact	hoffmeis@zmnh.uni-hamburg.de

15. DNA Sequencing (Sanger)	
Module type	**ASMB research method course**
Responsible Lecturer	PD Dr. Sabine Hoffmeister-Ullerich
Length	2 days
Literature	Script
Participants	Max. 3
Credit Points	1
Course description	This course will give an introduction into the mechanisms and pitfalls of sequence analysis by the Sanger method and an overview of the currently available next gen sequencing techniques
Contact	hoffmeis@zmnh.uni-hamburg.de

16. Mouse course	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Bastian Tiemann (UKE Animal Facility)
Length	2 days
No. of participants	Max. 12
Credit Points	1
Course description	Lectures on Legal Regulations, mouse behaviour and physiology and animal welfare. Hands on training in handling, anaesthesia , blood sampling methods and euthanasia.
Contact	tiemann@uke.uni-hamburg.de, haemisch@uke.uni-hamburg.de

17. Co-Immunoprecipitation and Western Blot	
Module type	**ASMB research method course**
Responsible Lecturer	Prof. Dr. Meliha Karsak
Length	2 – 3 days
No. of participants	Max. 3
Credit Points	2
Course description	Introduction to methods that enable the purification of protein complexes. Proteins are physically isolated from a biological sample and subject to further analysis.
Contact	meliha.karsak@zmnh.uni-hamburg.de

18. *In vitro* reconstitution of actin filaments and microtubules analyzed by TIRFM	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Marina Mikhaylova
Length	1 – 2 days
No. of participants	Max. 2
Credit Points	1
Course description	Measurements of assembly dynamics of individual polymers (actin filaments and microtubules) using light microscopy (TIRFM)
Contact	marina.mikhaylova@zmnh.uni-hamburg.de

19. Two photon microscopy - an introduction to the principle and technique	
Module type	**ASMB research method course**
Responsible Lecturer	Prof. Dr. Thomas Oertner, Dr. Simon Wiegert
Length	3 days
Participants	Max. 2
Credit Points	2
Course description	two photon microscopy, an introduction
Contact	thomas.oertner@zmnh.uni-hamburg.de simon.wiegert@zmnh.uni-hamburg.de

20. Synaptic plasticity in the hippocampus, In-vitro field recordings of EPSPs in the hippocampus, LTP and LTD	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Ora Ohana
Length	3 days
Participants	Max. 3
Credit Points	2
Course description	For people interested in electrophysiology and plasticity
Contact	ora.ohana@zmnh.uni-hamburg.de

21. Transfection, protein expression, antibody staining, microscopy	
Module type	**ASMB research method course**
Responsible Lecturer	Yvonne Pechmann, Edda Thies, Dr. Frank Heisler
Length	1-3 days
Participants	Max. 4
Credit Points	2
Course description	
Contact	ypechm@zmnh.uni-hamburg.de, edda.thies@zmnh.uni-hamburg.de

22. Chromatin Immunoprecipitation	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Ole Pleß
Length	5 days
Participants	Max. 3
Credit Points	2
Course description	You can bring your own gene of interest and cell line
Contact	ole.pless@screeningport.com, Ph.: 040 303764-233 (Biomarker lab)

23. Analysis of small G-Protein activity	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Ralf Scholz
Length	4-5 days
Literature	Script
Participants	Max. 3
Credit Points	2
Course description	During the course basic cell culture and transfection methods are used in order to apply a GTP-sensitive pull-down assay and semi quantitative western blot analysis to evaluate cellular activity of small G-proteins.
Contact	ralf.scholz@zmnh.uni-hamburg.de

24. Introduction to the bioinformatics	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Christian Schulze
Length	1 day
Participants	Max. 2
Credit Points	1

Course description	Some advanced methods for gene expression, ChIP, and genotyping data analysis are touched. Gene regulation by transcriptional networks is discussed.
Contact	christian.schulze@zmnh.uni-hamburg.de

25. Introduction to machine learning with neural networks and Tensorflow	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Jörn Bethune
Length	2 day
Participants	Max. 5
Credit Points	2
Course description	This course requires basic programming skills. If you know what a function is and how to define one (in any programming language) and if you know what function parameters and return values are, you qualify for this course.
Contact	joern.bethune@zmnh.uni-hamburg.de

26. Confocal laser microscopy	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Michaela Schweizer
Length	2 days
Literature	Laser Scanning Confocal Microscopy; N.S. Claxon, T.J. Fellers, M.W. Davidson; How the Confocal Laser Scanning Microscope entered Biological Research; W.B. Amos, J.G. White; Biology of the Cell 95 (2003) 335-342.
Participants	Max. 4
Credit Points	1
Course description	The course gives insight into the theories and practice of the modern Confocal Laser scanning Microscopy. You can investigate your own samples
Contact	michaela.schweizer@zmnh.uni-hamburg.de

27. Transgenesis and *in vivo* imaging of neuronal structures in *Drosophila melanogaster*	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Peter Šoba
Length	2-3 days
Participants	Max. 4
Credit Points	2
Course description	
Contact	peter.soba@zmnh.uni-hamburg.de

28. Introduction to flow cytometry	
Module type	**ASMB research method course**
Responsible Lecturer	Prof. Dr. Eva Tolosa
Length	1 day
Literature	Script
Participants	Max. 6
Credit Points	1

Course description	With this practical course the students will learn how to isolate human blood cells, perform a basic (2-colour) cell surface staining, and analyze the fluorochrome-labelled cells in a FACS machine. After the course, the students should also be able to understand the meaning of FACS data in scientific publications.
Contact	etolosa@uke.de

29. Advanced flow cytometry	
Module type	**ASMB research method course**
Responsible Lecturer	Prof. Dr. Eva Tolosa
Length	1,5 day
Literature	Script
Participants	Max. 6
Credit Points	1
Course description	
Contact	etolosa@uke.de

30. Live Cell Imaging, Time-lapse microscopy of neuronal cells	
Module type	**ASMB research method course**
Responsible Lecturer	Dr. Kira Brune
Length	1-3 days
Participants	Max. 4
Credit Points	1
Course description	
Contact	kira.brune@zmnh.uni-hamburg.de

3. Curriculum: Optional Courses

3.1. Optional Interdisciplinary Lectures, Seminars, Conferences and Courses

Lectures on immunology	
Module type	**Optional interdisciplinary lectures**
Responsible Lecturers	Prof. Haag, Prof. Nolte, UKE Dept. of Immunology
Length	Two hours on Tuesdays
Literature	-
No. of participants	Registration not required
Credit Points	1 for 8 visited lectures
Course description	
Contact	UKE Dept. of Immunology

Seminars on immunology and cellular biology	
Module type	**Optional interdisciplinary seminars**
Responsible Lecturer	Prof. Haag, Prof. Mittrücker, Prof. Nolte, UKE Dept. of Immunology
Length	on Thursdays from 1.30 p.m. to 2 p.m.
Literature	-
No. of participants	Registration not required
Credit Points	1 for 10 visited seminars
Course description	
Contact	UKE Dept. of Immunology

Department / Institute Seminars	
Module type	**Optional interdisciplinary courses**
Responsible Lecturer	Organizers of the respective seminar
Length	-
Literature	-
No. of participants	Registration not required
Credit Points	1 for 10 visited seminars
Course description	Scientific seminar series offered by the ZMNH, the Hamburg Center of Neuroscience (HCNS), the Dept. of Neuroanatomy and other departments of the University of Hamburg
Contact	Coordinators at the different departments

Scientific conferences	
Module type	**Optional interdisciplinary courses**
Responsible Lecturer	Organizers of the respective conference
Length	At least one day
Literature	-
No. of participants	According to registration requirements
Credit Points	1 for participation 1 for poster presentation at the conference 1 for talk at the conference (with or without poster presentation)
Course description	-
Contact	Organizers of the respective conference

All-day advanced training	
Module type	**Optional interdisciplinary courses**
Responsible Lecturer	Internal or external provider (e.g. DFG, DAAD, etc.)
Length	At least one day
No. of participants	According to registration requirements
Credit Points	1
Contact	Organizers of the respective training

3.2. Optional Research Methods Courses

Research Methods Courses of other providers	
Module type	**Optional research methods courses**
Responsible Lecturer	ASMB cooperates with the following graduate schools - HCNS graduate program - IMPRS-UFAST courses - UKE PhD Programmes for Medical and Non-Medical Students
Study objective	Further scientific education
No. of participants	Depending on capacity in the classes
Credit Points	Depending on the length of the course
Contact	Organizers of the respective course

3.3. Optional Academic Key Skills Courses

Good Scientific Practice	
Advanced Writing Skills for Science and Research for young scientists	
Advanced Presentation Skills for Science and Research	
Project Management for Science and Research	
Funding Instruments	
and further academic key skill courses	
Module type	**Academic key skill course**
Course descriptions and Contact	Please contact Roswitha Wörz E-Mail: roswitha.woerz@verw.uni-hamburg.de Team Activities for Graduate Students or the Deanery of the Medical Faculty of the University of Hamburg: Dr. rer. nat. Katrin Klempahn, k.klempahn@uke.de

4. Academic Staff of the ASMB

Professors, Junior Professors, Lecturers

(according to § 166 Abs. 2 Ziff. 1 HmbHG a.F.)

Borgmeyer, Uwe, Dr. rer. nat., PrivDoz (Neurobiology)	UKE Center for Molecular Neurobiology (ZMNH) Core facility Transgenic animals
Bonn, Stefan, Dr. rer. nat., Univ.-Prof. (Systems Biologie)	UKE Center for Molecular Neurobiology (ZMNH) Institute of Medical Systems Biology
Christ, Torsten, Dr. med., PrivDoz (Experimental Pharmacology and Toxicology)	UKE Center for Experimental Medicine Institute of Experimental Pharmacology and Toxicology
Eschenhagen, Thomas, Dr. med., Univ.-Prof. (Experimental Pharmacology and Toxicology)	UKE Center for Experimental Medicine Institute of Experimental Pharmacology and Toxicology
Fehse, Boris, Dr. rer. nat., Univ.-Prof. (Cell- and Genetherapy),	UKE Center for Oncology Research Dept. Cell and Gene Therapy, Dept. of Stem Cell Transplantation
Fleischer, Bernhard, Dr. med., Univ.-Prof. (Immunology and Virology)	BNI Bernhard-Nocht-Institute for Tropical Medicine Dept. of Immunology UKE, Center for Diagnostic Dept. of Immunology
Friese, Manuel, Dr. med., Univ.-Prof. (Translational Neuroimmunology)	UKE Center for Molecular Neurobiology (ZMNH) Institute for Neuroimmunology and Clinical Multiple Sclerosis Research
Grundhoff, Adam, Dr. rer. nat., Prof. (Virus Genomic)	HPI Heinrich-Pette-Institut Leibniz Institut for Experimental Virology
Haag, Friedrich, Dr. med., Univ.-Prof. (Immunology/Molecular Biologie)	UKE Center for Diagnostic Dept. of Immunology
Hanganu-Opatz, Ileana, Dr. rer. nat., Univ.-Prof. (Developmental neurophysiology)	UKE Center for Molecular Neurobiology (ZMNH) Res. Group Developmental Neurophysiology
Hansen, Arne, Dr. med., Prof. (Cardiac Tissue Engineering)	UKE Center for Experimental Medicine Institute of Experimental Pharmacology and Toxicology
Hermans-Borgmeyer, Irmgard, Dr. rer. nat., PrivDoz (Neurobiology)	UKE Center for Molecular Neurobiology (ZMNH) Core facility Transgenic animals
Hermey, Guido, Dr. rer. nat., PrivDoz (Neurobiology)	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular and Cellular Cognition
Hoffmeister-Ullerich, Sabine, Dr. rer. nat.,	UKE

PrivDoz (Molecularbiology)	Center for Molecular Neurobiology (ZMNH) Core facility Bioanalytics
Jacobs, Thomas, Dr. rer. nat., PrivDoz (Immunology and Virology)	BNI Bernhard-Nocht-Institute for Tropical Medicine Dept. of Immunology
Karsak, Meliha, Dr. rer. nat., Univ.-Prof. (Molekulare Neurobiologie)	UKE Center for Molecular Neurobiology (ZMNH) Research Group Neuronal and Cellular Signaltransduction
Kneussel, Matthias, Dr. rer. nat., Univ.-Prof. (Genetic and Molecularbiology)	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular Neurogenetics
Kreienkamp, Hans-Jürgen, Dr. rer. nat., Univ.-Prof., (Human Genetics)	UKE Center for Obstetrics and Paediatrics, Dept. of Human Genetics
Kubisch , Christian, Dr. med., Univ.-Prof. (Human Genetics)	UKE Inst. of Human Genetics, Center for Obstetrics and Pediatrics
Kuhl, Dietmar F., Dr. rer. nat., Univ.-Prof. (Neurobiology)	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular and Cellular Cognition
Mittrücker, Hans-Willi, Dr. rer. nat., Univ.-Prof. (Immunology)	UKE Center for Diagnostic Dept. of Immunology
Neu, Axel, Dr. med., PrivDoz (Neuropediatrics)	UKE Center for Obstetrics and Paediatrics Dept. of Paediatrics
Nolte, Friedrich, Dr. med., Univ.-Prof. (Immunology)	UKE Center for Diagnostic Dept. of Immunology
Oertner, Thomas, Dr. rer. nat., Univ.-Prof. (Neurobiology)	UKE Center for Molecular Neurobiology (ZMNH) Institute for Synaptic Physiology
Schinke, Thorsten, Dr. rer. nat., Univ.-Prof. (Osteology)	UKE Center for Experimental Medicine Dept. of Osteology and Biomechanics
Tolosa, Eva, Dr. rer. nat., Univ.-Prof. (Immunology)	UKE Center for Diagnostic Dept. of Immunology
Wiegert, J. Simon, Dr. rer. nat., Univ.-Prof. (Neurobiology)	UKE Center for Molecular Neurobiology (ZMNH) Institute for Synaptic Physiology

Supervisors and Scientific Assistants

Bär, Julia, Dr. rer. nat	UKE Center for Molecular Neurobiology (ZMNH) Res. Group: Emmy-Noether Group: Neuronal Protein Transport
Brune, Kira, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular Neurogenetics
Calderon de Anda, Froylan, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Research Group Neuronal Development
Cornils, Kerstin, Dr. rer. nat. PrivDoz	UKE Center for Oncology Dept. of Pediatric Hematology and Oncology
David, Jean-Pierre, Dr. rer. nat.	UKE Center for Experimental Medicine Institute for Osteology and Biomechanics
Duncan, Kent, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Research Group Neuronal Translational Control
Engler, Jan Broder, Dr.med., Dr. hum.biol.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Neuroimmunology and Clinical Multiple Sclerosis Research
Giovanna Galliciotti, Dr. rer. nat.	UKE Center for Diagnostic, Dept. of Neuropathology,
Gee, Christine, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Synaptic Physiology
Gretenkord, Sabine, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Res. Group Developmental Neurophysiology
Hassani Nia, Fatemeh, Dr. rer. nat.	UKE Center for Obstetrics and Paediatrics, Dept. of Human Genetics
Hausrat, Torben, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular Neurogenetics
Heisler, Frank, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular Neurogenetics
Mikhaylova, Marina, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Res. Group: Emmy-Noether Group: Neuronal Protein Transport
Morellini, Fabio, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) ZMNH Research Group Behavioral Biology
Ohana, Ora, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular and Cellular Cognition
Pleß, Ole, Dr. rer. nat.	Biomarker Laboratory of the European

	Screening Port GmbH located at the ZMNH
Puig-Martorell, Berta, PhD	UKE, Institute for Neuropathologie,
Schattling, Benjamin, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Neuroimmunology and Multiple Sclerosis
Scholz, Ralf, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular and Cellular Cognition
Schulze, Christian, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute for Synaptic Physiology
Schweizer, Michaela, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) ZMNH Service Group Morphology
Sepulveda-Falla, Diego, Dr. med.	UKE Department of Neuropathology, Center for Diagnostic
Šoba, Peter, Dr. rer. nat.	UKE Center for Molecular Neurobiology (ZMNH) Research Group Neuronal patterning and connectivity
Tiemann, Bastian, Dr. med. vet.	UKE Animal Facility
Zimmermann, Marina, Dr. rer, nat.	UKE Center for Molecular Neurobiology (ZMNH) Institute of Medical Systems Biology

Guest Professors and Lecturers
(according to § 17 Abs. 1 HmbHG und Privatdozenten nach § 17 Abs. 2 HmbHG)

Schwarz, Jürgen R., Dr. med., Prof. (Physiology)	UKE Center for Molecular Neurobiology (ZMNH) Institute for Molecular Neurogenetics