UNIVERSITÄT ZU LÜBECK

Module Guide for the Study Path

Master Nutritional Medicine 2023

Version from 1. April 2025

1st semester

2nd semester

3rd semester

4th semester

EW4110-KP08 - Pharmaconutrition (PharmaNM)

Duration:	Turnus of offer:	Credit points:
1 Semester	each winter semester	8

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), Nutritional Sciences, 1st semester
- Master Nutritional Medicine 2019 (compulsory), Nutritional Sciences, 1st semester

Classes and lectures:

- Pharmacology for nutritional medicine (lecture, 4 SWS)
- Pharmacology for nutritional medicine (exercise, 2 SWS)

Workload:

- 150 Hours private studies
- 90 Hours in-classroom work

Contents of teaching:

- 1. General pharmacology
- 1.1 Pharmacokinetics (LADME model, pharmacokinetic parameters)
- 1.2 Pharmacodynamics (agonism/antagonism, dose-response-relationships, mechanisms of action, receptor types)
- 1.3 Adverse drug reactions (mechanisms, risk factors, pharmacogenetics, kidney and liver injuries, prevention, ADR of herbal supplements)
- 1.4 Drug interactions (mechanisms of drug-drug interactions and food-drug-interactions)
- 1.5 Regulatory affairs of pharmaceuticals (new medications development, phases of clinical studies, approval, pharmacovigilance)
- 2. Specific pharmacology in nutritional medicine
- 2.1 Analgetics (NSAID, opioids, co-analgetics, pharmacotherapy of migraine, local anaesthetics, general anaesthetics)
- 2.2 Gastrointestinal pharmacology (ulcer drugs, helicobacter eradication, CID drugs, laxatives, antidiarrhoeal drugs, antiemetics)
- 2.3 Metabolic pharmacology (pharmacotherapy of diabetes, osteoporosis, obesity, cachexia, gout, dyslipidaemia, pharmacotherapy after bariatric surgery)
- 2.4 Endocrine pharmacology (gluco- and mineralocorticoids, thyroid hormones)
- 2.5 Cardiovascular pharmacology (antihypertensives, diuretics, RAAS inhibitors, adrenoceptor antagonists, calcium antagonists)
- 2.6 Anticoagulants and antiplatelet medication (vitamin K antagonists, NOAC, heparin, clopidogrel, ASS)
- 2.7 Neuropharmacology (antidepressants, antipsychotics, anxiolytics, sedatives, hypnotics)
- 2.8 Antimicrobial pharmacology (mechanisms of action and resistance, antibiotics, antiviral drugs, antifungals)
- 2.9 Antineoplastic pharmacology (mechanisms of action and resistance, chemotherapy, targeted therapies, endocrine therapy, adjuvant pharmacotherapy)
- 3. Pharmaconutrition, nutraceuticals and functional food
- 3.1 Definition and history of immunonutrition
- 3.2 Nutraceuticals and functional food (?3 fatty acids, phytosterols, conjugated linoleic acids (CLA), structured lipids, sphingolipids, prebiotic fibres, prebiotic oligosaccharides, probiotics, folic acid, vitamin E, tocotrienols, calcium, magnesium, iron, selenium, zinc, phytochemicals)
- 3.2 Pharmacological use of nutraceutcials (ICU, oncology, geriatrics, neurology)
- 3.3 Effects of food ingredients and diets on pharmacological drug action (pharmacomicrobiomics, food drug interactions, radio-/chemosensitizer, short-term fasting, fasting mimetics, ketogenic diet)
- 3.4 Effects of food ingredients on pharmacotherapy adverse effects (drug specific supplementation of nutrients)

Qualification-goals/Competencies:

- Professional competences: The students have broad knowledge of general pharmacology and selected pharmacological fields in nutritional medicine. They are able to explain and critically discuss the underlying pharmacological principles and transfer them to innovative approaches. They have special skills in analysing complex pharmaconutritional problems and perform a critical review of current literature regarding questions of pharmaconutrition. The students can develop strategic approaches that integrate pharmacological, nutritional and technological aspects.
- Personal competences: The students are able to discuss pharmaconutritional questions in small teams and they are capable of providing methods of resolution. They can reflect their specific knowledge, identify limitations of pharmacological studies and independently develop useful and strategic research issues.

Grading through:

- Regular attendance at seminars
- written exam

Responsible for this module:

- Prof. Dr. rer. nat. Martin Smollich

Teacher:

- Institute of Nutrition Medicine
- Prof. Dr. rer. nat. Martin Smollich

Literature:

- by Laurence Brunton (Author), Bruce Chabner (Author), Bjorn Knollman (Author): Goodman and Gilman's The Pharmacological Basis of Therapeutics - Mcgraw-Hill Education Ltd; 12. Edition
- Higdon J, Drake VJ: An Evidence-based Approach to Phytochemicals and Other Dietary Factors. - Thieme; 2nd edition (2012)
- Meyer AH (ed): Praxishandbuch Functional Food. - Behr s Verlag, 81st edition (2019)

Language:

- offered only in English

Notes:

Admission requirements for taking the module:
- None

Admission requirements for participation in module examination(s):
- Successful completion of exercises as specified at the beginning of the semester

Module examination(s):
- EW4110-L1: Pharmaconutrition, written exam, 120 min, 66.67% of the module grade
- EW4110-L2: Pharmaconutrition, successful presentation as part of the exercises, 33.33% of the module grade

(proportion of Institute of Nutritional Medicine to V is 100%)
(share of Institute of Nutritional Medicine in Ü is 100%)

EW4150-KP07 - Psychology of eating behavior (advanced course)) (EssPsy)

Duration:	Turnus of offer:	Credit points:
1 Semester	each winter semester	7

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), Nutritional Sciences, 1st semester
- Master Nutritional Medicine 2019 (compulsory), Nutritional Sciences, 1st semester

Classes and lectures:

- Psychology of eating behavior (lecture, 2 SWS)
- Psychology of eating behavior (seminar, 2 SWS)

Workload:

- 105 Hours private studies
- 60 Hours in-classroom work
- 10 Hours exam preparation

Contents of teaching:

- Advanced psychological principles of food intake
- Advanced mpirical methods to investigate the eating behavior
- Advanced theoretical principles of pathological nutrition
- Pre- and intervention techniques for healthy nutrition behavior (advanced)
- Health psychology and Food intake (advanced level)
- Nutritional Marketing, food preference and food choice (advanced level)
- Social and cultural components of nutrition behavior (advanced level)

Qualification-goals/Competencies:

- Acquisition of basic concepts, theories and empirical findings of nutrition psychology
- Introduction to the empirical methods of eating behavior
- Understanding the basic and extended theories about pathological eating behavior, such as bulimia and obesity
- Understanding the basic principles of motivational psychology and learning theories and the ability to link those to the psychology of hunger, satiety and thirst
- Understanding psychological theories to reason the intervention techniques
- Introduction to the nutritional marketing, food preference and food choice
- Ability to communicate (present and discuss in groups) current empirical works

Grading through:

- written exam

Responsible for this module:

- Prof. Dr. med. Thomas Münte

Teacher:

- Department of Neurology
- PD Dr. rer. nat. Dipl.-Psych. Marcus Heldmann
- Dr. rer. hum. biol. Andreas Sprenger

Literature:

- Shepherd, R & Raats, M: The psychology of food choice
- Logue, AW: The Psychology of Eating and Drinking
- Allison, DB, Baskin ML: Handbook of assessment Methods for eating behaviors and weight-related problems

Language:

- offered only in English

Notes:

Admission requirements for taking the module:
- none

Admission requirements for the module examination(s):
- active participation in the exercises as specified at the beginning of the semester

Module examination(s):
- EW4150-L1: Psychology of eating behavior (advanced course), written exam, 90 min, 100 % of the grade

EW4170-KP05 - Systems Biology (SystBio)

Duration:	Turnus of offer:	Credit points:
1 Semester	each winter semester	5

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), Nutritional Sciences, 1st semester
- Master MLS 2018 (optional subject), life sciences, 1st semester
- Master MLS 2016 (optional subject), interdisciplinary competence, 1st semester
- Master Nutritional Medicine 2019 (compulsory), life sciences, 1st semester

Classes and lectures:

- Introduction to classic and translational system biology (lecture, 2 SWS)
- Introduction to classic and translational system biology (exercise, 2 SWS)

Workload:

- 70 Hours private studies
- 60 Hours in-classroom work
- 20 Hours exam preparation

Contents of teaching:

- Introduction to the genome and proteome of cellular systems
- Networks: cellular, genetic, gene-regulatory networks, interactomes
- Analysis of dynamical systems: fixed points, bifurcations and feedback
- Bioinformatic analysis of Omics data
- Introduction to public databases: e.g. STRING, Gene Expression Omnibus, TCGA, KEGG, Reactome, MSigDB
- Exercises: computer lab for analysis of dynamical systems and cellular pathways in R
- Exercises: Practical exercises on the analysis of dynamical systems and cellular signaling pathways.
- Exercises on the solution of differential equations

Qualification-goals/Competencies:

- The students can explain the principles of signal transduction in the cell
- The students can relate to the genome, transcriptome, interactome and proteome
- They can analyse and characterize dynamical systems
- They know common methods to analyse high-throughput data
- Lab work will enable the students to continue studying this subject on their own

Grading through:

- written exam

Responsible for this module:

- Prof. Dr. Hauke Busch

Teacher:

- LIED | Lübecker Institut für experimentelle Dermatologie (Lübeck Institute of Experimental Dermatology)
- Prof. Dr. Hauke Busch
- Dr. Axel Künstner
- MitarbeiterInnen des Instituts

Literature:

- Marian Walhout, Marc Vidal, Job Dekker: Handbook of Systems Biology: Concepts and Insights - (Englisch) Gebundene Ausgabe 15. November 2012
- Edda Klipp, Wolfram Liebermeister, Christoph Wierling, Axel Kowald;: Systems Biology: A Textbook - Englisch) Taschenbuch 20. April 2016
- Yoram Vodovotz and Gary: An Translational Systems Biology, Concepts and Practice for the Future of Biomedical Research

Language:

- offered only in English

Notes:

Prerequisites for the module:
- nothing

Prerequisites for admission to the written examination:
- successful participation in the exercises

Module exam:
- EW4170-L1: Systembiology, written exam, 90 min, 100 % module grade

MA2214-KP04, MA2214 - Clinical Studies (KlinStud)

Duration:	Turnus of offer:	Credit points:
1 Semester	each winter semester	4

Course of study, specific field and term:

- Bachelor CLS 2023 (compulsory), mathematics, 3rd or 5th semester
- Master Nutritional Medicine 2023 (compulsory), medical computer science, 1st semester
- Bachelor Medical Informatics 2019 (optional subject), medical computer science, 4th to 6th semester
- Bachelor CLS 2016 (compulsory), mathematics, 3rd or 5th semester
- Master Nutritional Medicine 2019 (compulsory), medical computer science, 1st semester
- Bachelor Medical Informatics 2014 (optional subject), medical computer science, 5th or 6th semester
- Master Computer Science 2012 (optional subject), specialization field medical informatics, 3rd semester
- Bachelor Medical Informatics 2011 (optional subject), medical computer science, 4th to 6th semester
- Bachelor MES 2011 (optional subject), life sciences, 3rd or 5th semester
- Bachelor CLS 2010 (compulsory), mathematics, 3rd or 5th semester

Classes and lectures:

- Clinical Studies (lecture, 2 SWS)
- Clinical Studies (exercise, 1 SWS)

Workload:

- 60 Hours private studies and exercises
- 45 Hours in-classroom work
- 15 Hours exam preparation

Contents of teaching:

- Definition of a clinical study according to the German Drug Law, classification of clinical studies, clinical development
- Basic principles of clinical trials and measures against bias
- Regulations and study documents
- Development of a clinical study, especially a study protocol
- Contents of a study protocol
- Link to health economics
- Further topics like
- Special study designs
- Advanced statistical analyses
- Report and publication
- Systematic overview and meta-analyses
- Data management and system validation
- Professional fields in clinical studies (study statistics, data management, monitoring, quality management, pharmacovigilance, project management)

Qualification-goals/Competencies:

- Students can describe the regulatory framework of clinical trials with drugs.
- They can describe the main areas of activity in the fields of study statistics, data management, monitoring, information technology and quality assurance.
- They can explain the basic principles of clinical trials and measures to achieve these basic principles.
- They can create a study protocol.
- They can represent study populations descriptively.
- They can perform case number planning for simple clinical studies.
- Students can assign studies and their key points to the stages of clinical development.
- They can explain different study designs.
- They are informed about ethical problems and guidelines and the principles of data protection.
- Acquisition of german and english technical language

Grading through:

- portfolio exam

Requires:

- Biostatistics 1 (MA1600-KP04, MA1600, MA1600-MML)

Responsible for this module:

- PD Dr. rer. pol. Reinhard Vonthein
- Prof. Dr. rer. biol. hum. Inke König

Teacher:

- Institute of Medical Biometry and Statistics

- PD Dr. rer. pol. Reinhard Vonthein
- Prof. Dr. rer. biol. hum. Inke König

Literature:

- Gaus W., Chase D.: Klinische Studien: Regelwerke, Strukturen, Dokumente und Daten - Norderstedt: Books on Demand GmbH 2007 (2. Auflage)
- Stapff M.: Arzneimittelstudien - Eine Einführung in klinische Prüfungen für Ärzte, Studenten, medizinisches Assistenzpersonal und interessierte Laien - Germering/München: W. Zuckschwerdt Verlag GmbH 2008 (5. Auflage)
- Schumacher, M., Schulgen, G.: Methodik klinischer Studien: Methodische Grundlagen der Planung, Durchführung und Auswertung - Berlin: Springer 2008 (3. Auflage)

Language:

- German and English skills required

Notes:

Admission requirements for taking the module:
- None (The competencies of the modules listed under 'Requires' are needed for this module, but are not a formal prerequisite)

Admission requirements for participation in module examination(s):
- None

Module exam(s):
- MA2214-L1: Clinical Studies, portfolio exam, 100 % of module grade, with a total of 200 points, distributed as follows:
+ 145 points for project work with documentation and presentations
+ 55 points for 5 short term papers

The course is held annually in German and English alternately. Languages Englisch or German may be chosen for homework and project with
documentation and presentation.

MZ5111-KP06 - Immunology (Immuno)

Duration:	Turnus of offer:	Credit points:
1 Semester	each winter semester	6

Course of study, specific field and term:

- Master Infection Biology 2023 (compulsory), Immunology, 1st semester
- Master Nutritional Medicine 2023 (Module part of a compulsory module), life sciences, 1st semester
- Master Molecular Life Science 2023 (optional subject), Immunology, 1st semester
- Master MLS 2018 (optional subject), Immunology, 1st semester
- Master Nutritional Medicine 2019 (Module part of a compulsory module), life sciences, 1st semester
- Master MLS 2016 (optional subject), cell biology, 1st semester

Classes and lectures:

- Immunology (lecture, 2 SWS)
- Immunology (seminar, 2 SWS)

Workload:

- 120 Hours private studies
- 60 Hours in-classroom work

Contents of teaching:

- Lecture: Introduction to immunology
- Cells of the innate immune system
- Innate immune system: pathogen recognition
- Complement and inflammation
- Introduction into the adaptive immune system
- Antigen-presentation and T cell activation
- Immunological memory
- Immune system and infektion I: bacteria, worms, fungi
- Immune system and infektion II: Viruses
- Signal transduktion in immune cells
- Organs and tissues of the immune system, homing
- Immunpathogenesis I: allergy and asthma
- Immunpathogenesis II: autoimmune diseases
- Immunprivileged Organs
- Hematopoiesis and hematopoietic stem cells
- Experimental and clinically applied biologicals
- Seminar: PCR
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- ELISA/ELISPOT
- Flow cytometry I: FACS-Analysis
- Flow cytometry II: MACS, FACS-Sort
- Flow cytometry III: Practical course at the ISEF (MACS, Analysis, Sort)
- Conventional and confocal microscopy
- Methods in signal transduction
- Migration: transwell assay; adhesion test etc.
- 2-Photon microscopy
- Animal models in life science
- Genetically modified mice I: conventional transgenics and KO mice
- Genetically modified mice II: conditional KO und Knock In Mice

Qualification-goals/Competencies:

- Students are able to:
- Name cells of the immune system and allocate their functions
- Name organs that belong to the immune system and allocate their functions
- Name mechanisms, cells and molecules of the innate and adaptive immune system and allocate their functions during bacterial, viral and fungal infections
- Name and allocate functions of molecules important for B cell -T cell co-cooperation
- Name and allocate the functions of molecules and antigen-presenting cells important for T cell activation and differentiation
- Name molecules of the complement system and allocate their functions for immune protection and immune diseases
- Name structure and function of the distinct antibody classes
- Name and allocate functions of molecules important for homing and migration of immune cells

- Name and allocate functions of molecules important for the initiation and resolution of inflammation
- Name the functions of immunological memory
- Name molecules and mechanisms involved in the development of B cell and T cell memory
- Describe the principal sequence of an immune reaction during infection and after vaccination
- Name genetic, molecular and cellular disturbances of the immune system relevant for immune deficiency, autoimmune and allergic diseases
- Describe the basic mechanisms of signal transduction in immune cells
- Name mechanisms and molecules involved in hematopoiesis
- Name and explain immunological methods
- Present and discuss scientific data

Grading through:

- written exam

Responsible for this module:

- Prof. Dr. rer. nat. Christian Karsten

Teacher:

- Institute for Systemic Inflammation Research (ISEF)

- Prof. Dr. rer. nat. Rudolf Manz
- Prof. Dr. med. Jörg Köhl
- Prof. Dr. rer. nat. Christian Karsten
- Prof. Dr. Admar Verschoor
- PD Dr. rer. nat. Yves Laumonnier

Literature:

- Janeway, Travers, Walport, Shlomchik: Janeway's Immunobiology - Routledge Chapman Hall
- : original and review articles

Language:

- offered only in English

Notes:

Prerequisites for the module:
- nothing

Prerequisites for admission to the written examination:
- succesful participation in the seminar MLS/NM (for MLS- and NM-students) or IB (for IB-students)

Module exam:
- LS4035-L1: Immunology, written exam, 90 min, 66,67 % module grade
- LS4035-L2: succesful participation in the Seminar, 33,33 % module grade

MZ5111 Immunology is an elective course in the graduate programs (GRK1727, IRTG1911 etc.) and equal to MZ5135-KP06.

EW4200 A - Module part: Food Hypersensitivity (FoHySe)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	2,67

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (Module part of a compulsory module), advanced curriculum, 2nd semester
- Master Nutritional Medicine 2019 (Module part of a compulsory module), advanced curriculum, 2nd semester

Classes and lectures:

- Food Hypersensitivity (lecture, 2 SWS)

Workload:

- 40 Hours private studies
- 30 Hours in-classroom work
- 10 Hours exam preparation

Contents of teaching:

- Introduction: Historical background, nomenclature and definitions. Anatomy of GI track and mucosal surfacesGI-brain axis
- Immunity basics: Innate and adaptive immunity
- Immune response and tolerance concept: Atopy/non atopy, Type 2 immune response, the tolerance concept, Mucosal surfaces immunity functions and regulation
- Animal models: Food allergies animal models, the lecture is coupled with the presentation of 2 articles by students, supported with some review
- Food Allergens: Molecular Structure, Function and Allergenicity: Allergen families (Plant Food Allergen Families; Animal Food Allergens), class I and class II food allergens
- Effect of food processing and Matrix Effect of allergenicity
- IBS Symptoms of Food Hypersensitivity and Allergy (Adults and Children): Allergen-based Food Allergies, Disease-based Food Allergies Lower GI dysmotility disorders - diarrhoea, constipation and abdominal pain, Reflux and upper GI motility disorders
- Eosinophilic diseases: Coeliac disease,eosinophilic esophagitis,controversies and challenges in diagnosis and management
- FPIES: An overview from mechanisms to management: Other non IgE mediated food allergies
- Allergen data bases and molecular diagnostic
- Management and Treatment of Food Allergy (Adults and Children): Diets, pharmacological management,causal treatment (specific immunotherapy), prevention
- Allergy Diagnostic Tests In vitro/ In vivo: Epidemiology, food challenge and introductions in practice, tests to support a diagnosis of non-IgE mediated gastrointestinal allergy - biopsy, pH studies, manometry, hydrogen breath tests
- Food hypersensitivity and diagnostic: Patient coming in the seminar room open discussion

Qualification-goals/Competencies:

- The students will be able to distinguish the pathophysiological and immunological characteristics of food hypersensitivities and allergies.
- They will acquire knowledge of the immunological and physiological mechanisms of a variety of allergic gastrointestinal disorders. This will cover both IgE and non-IgE-mediated hypersensitivities, molecular characteristics of allergenicity, and the effects of digestion and food processing.
- They will gain knowledge of the dietary management of food hypersensitivities and intolerances.

Grading through:

- written exam

Responsible for this module:

- PD Dr. rer. nat. Yves Laumonnier

Teacher:

- Institute of Nutrition Medicine
- PD Dr. rer. nat. Yves Laumonnier
- Prof. Dr. med. Christian Sina
- Prof. Dr. med. Uta Jappe
- Dr. med. Maike Holtsche

Literature:

- Cirkovic Velickovic T, Gavrovic-Jankulovic M: Food Allergens. Biochemistry and Molecular Nutrition. - Springer Verlag 2014

- Metcalfe DD, Sampson HA, Simon RA, Lack G.: Food Allergy. Adverse Reaction to Foods and Food Additives - Wiley Blackwell 5th Edition, 2014
- Ebisawa M, Ballmer-Weber BK, Vieths S, Wood RA.: Food Allergy: Molecular Basis and Clinical Practice. - Karger. 2015

Language:

- offered only in English

Notes:

(Is part of module EW4200-KP08)
For details see module EW4200-KP08.

EW4200 B - Module part: Metabolic Medicine (MetMed)

Duration:	Turnus of offer:	Credit points:	Max. group size:
1 Semester	each summer semester	2,67	10

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (Module part of a compulsory module), advanced curriculum, 2nd semester
- Master Nutritional Medicine 2019 (Module part of a compulsory module), advanced curriculum, 2nd semester

Classes and lectures:

- Metabolic Medicine (lecture, 2 SWS)

Workload:

- 50 Hours private studies
- 30 Hours in-classroom work

Contents of teaching:

- Chronometabolism
- Sex steroids and metabolism
- Sleep and metabolism
- Developmental biology of metabolism
- Stress and metabolism
- Microbiome and metabolism

Qualification-goals/Competencies:

- Introduction to current topics in metabolic physiology and biomedicine
- Introduction into experimental approaches to analyze metabolic processes
- The students understand the molecular mechanisms of metabolic diseases
- They are able to develop strategies for a solution-oriented experimental design

Grading through:

- continuous, successful participation in course, >80%

Responsible for this module:

- Prof. Dr. rer. nat. Henrik Oster

Teacher:

- Institute of Neurobiology

- Prof. Dr. rer. nat. Henrik Oster
- Dr. rer. nat. Violetta Pilorz
- Dr. rer. nat. Isabel Heyde
- PD Dr. Misa Hirose

Literature:

- Keith N. Frayn: Metabolic Regulation: A Human Perspective - Wiley-Blackwell (2010), ISBN : 978-1-4051-8359-8
- Vargatu, I.: Williams textbook of endocrinology - Acta Endocrinologica (Bucharest) 12.1 (2016): 113
- : Original publications and Reviews

Language:

- offered only in English

Notes:

Is part of the EW4200-KP08 module.
For details see module EW4200-KP08 (Examination, see main module).

Note on the organization of EW4200 B:
The course is divided into 6 blocks of 2 weeks each (plus 1 introductory week), each of which is supervised by a specific lecturer. In the first week of a block, the lecturer gives an introductory lecture (45 minutes) followed by a presentation discussion given by a student (20 minutes + 15 minutes discussion). At the end of the day, the students are given a scientific problem. The students develop experimental solutions for the given problem, which are discussed in the group in the second week.

(Share of Institute of Neurobiology in V is 100%)

EW4200-KP08 - Moleculare medicine (MolMed)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	8

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), advanced curriculum, 2nd semester
- Master Nutritional Medicine 2019 (compulsory), advanced curriculum, 2nd semester

Classes and lectures:

- See module parts: EW4200 A, EW4200 B, EW4200 C, LS4101 A, LS4101 B, LS4101 C and LS4101 G (lecture, 6 SWS)

Workload:

- 150 Hours private studies and exercises
- 90 Hours in-classroom work

Contents of teaching:

- see descriptions of the module parts EW4200 A, EW4200 B, EW4200 C, LS4101 A, LS4101 B, LS4101 C und LS4101 G

Qualification-goals/Competencies:

- see descriptions of the module parts EW4200 A, EW4200 B, EW4200 C, LS4101 A, LS4101 B, LS4101 C und LS4101 G

Grading through:

- written exam, oral exam and/or presentation as announced by the examiner

Responsible for this module:

- Prof. Dr. Stefanie Derer-Petersen

Teacher:

- Institutes of the Unversity of Lübeck

Language:

- offered only in English

Notes:

Admission requirements for taking the module:
- none

Admission requirements for the module examination(s):
-none

Module examination(s):
- EW4200-L1: Molecular Medicine, elective, 90 min, 100 % of the grade

Module EW4200-KP08 consists of the module parts EW4200 A, EW4200 B, EW4200 C, LS4101 A, LS4101 B, LS4101 C and LS4101 G.

Three module parts have to be chosen. Each part is valued one third for the grade.

EW4210-KP05 - Omics in Nutritional Medicine (Nugenom)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	5

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), Nutritional Sciences, 2nd semester
- Master Nutritional Medicine 2019 (compulsory), Nutritional Sciences, 2nd semester

Classes and lectures:

- Nutrigenomics (lecture, 2 SWS)
- Nutrigenomics (seminar, 2 SWS)

Workload:

- 60 Hours in-classroom work
- 60 Hours private studies
- 10 Hours exam preparation

Contents of teaching:

- Genomics
- Transcriptomics
- Nutrigenomics
- Proteomics
- Metabolomics
- Culturomics
- Models in nutritional medicine (incl. animal models)

Qualification-goals/Competencies:

- Students will get knowledge about the concepts of personalized nutrition
- They will develop advanced knowledge of the methods used in nutrigenomics
- They will develop advanced knowledge of epigenetics and transcriptional regulation
- They will get to know associated target genes of different diseases
- They will develop skills of oral presentation

Grading through:

- written exam

Responsible for this module:

- Dr. rer. nat. Anna Kordowski

Teacher:

- Institute of Nutrition Medicine

- Prof. Dr. rer. nat. Ulrich Günther
- Prof. Dr. med. Christian Sina
- Prof. Dr. med. Saleh Ibrahim
- Prof. Dr. rer. nat. Henriette Kirchner
- Prof. Dr. rer. nat. Timo Gemoll, MSc
- Prof. Dr. Hauke Busch
- Dr. rer. nat. Anna Kordowski

Literature:

- Claude Bouchard and Jose M. Ordovas: Recent adventages in nutrigenetics and nutrigenomics - Elsevier Verlag (2012)
- Lynnette R. Ferguson: Nutrigenomics and Nutrigenetics in Functional Foods and Personalized Nutrition - CRC Press (2013)
- : - Current literature

Language:

- offered only in English

Notes:

Admission requirements for taking the module:
- none

Admission requirements for the module examination(s):
-Successful completion of exercises as specified at the beginning of the semester

Module examination(s):
- EW4210-L1 Omics in Nutritional Medicine, written exam, 90 min, 100 % of the grade

The seminar will be the project oriented work and the successful completion will be required to be able to take part in the exam.

EW4230-KP05 - Nutritional therapy (NuThe)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	5

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), Nutritional Sciences, 2nd semester
- Master Nutritional Medicine 2019 (compulsory), Nutritional Sciences, 2nd semester

Classes and lectures:

- Nutritional Therapy (lecture, 2 SWS)
- Nutritional Therapy (exercise, 2 SWS)

Workload:

- 60 Hours private studies
- 60 Hours in-classroom work
- 10 Hours exam preparation

Contents of teaching:

- How to start a start up in nutritional medicine
- Challenges in nutritional medicine (Clinical trials in nutrition, real world data, new trial designs) + Regulatory affairs (EMA/ EFSA etc.)
- Mikronutrients & Phytochemicals
- Introduction to Biomarkers, non genetic Biomarkers
- Genetic biomarkers in nutritional medicine
- Digital Biomarkers in Personalized Nutrition/ Migraine prophylaxis
- Sports and physical activity in preventive medicine
- Prevention of Depression
- Microbiome modulation
- Aging/ Inflammaging/ Immunosenecence
- Prevention of Metabolic diseases
- Allergy prevention
- Prevention of GI disorders

Qualification-goals/Competencies:

- Students will get knowledge about the concepts in nutrition therapy
- They will get knowledge about functional food, Probiotics and Prebiotics
- They will develop advanced knowledge of nutrition therapy of different diseases
- They will develop skills of oral presentation of scientific articles in the field of nutrition therapy

Grading through:

- written exam

Responsible for this module:

- Prof. Dr. med. Christian Sina

Teacher:

- Institute of Nutrition Medicine

- Dr. Torsten Schröder
- Prof. Dr. med. Christian Sina
- Prof. Dr. med. Sebastian Meyhöfer
- Prof. Dr. rer. nat. Martin Smollich
- Jörg Riedl

Literature:

- A. Skipper: Advanced Medical Nutrition Therapy Practice - Jones & Bartlett Publ Inc, 2008
- : - Current literature
- M. Nelms/K.P. Sucher: Nutrition Therapy and Pathophysiology - Brooks Cole Pub Co, 2015

Language:

- offered only in English

Notes:

Admission requirements for taking the module:
- none

Admission requirements for the module examination(s):
-none

Module examination(s):
- EW4230-L1: Nutritional therapy, written exam, 90 min, 100 % of the grade

EW4240-KP06 - Neurobiology (NeuroB)

Duration:	Turnus of offer:	Credit points:
1 Semester	every summer semester	6

Course of study, specific field and term:

- Master Nutritional Medicine 2019 (optional subject), neuroscience, 2nd semester
- Master Nutritional Medicine 2023 (optional subject), neuroscience, 2nd semester

Classes and lectures:

- EW4240-S Neurobiology (seminar, 2 SWS)
- EW4240-V Neurobiology (lecture, 2 SWS)

Workload:

- 120 Hours private studies
- 60 Hours in-classroom work

Contents of teaching:

- CNS anatomy
- CNS development
- Neurotransmission
- Neurotransmitters and their receptors
- Intracellular signal transduction in neurons
- Peripheral nervous system
- Plasticity and memory formation
- Homeostatic functions of the brain
- Motivation and decision making
- Circadian rhythms and sleep
- Gut-brain axis
- The endocrine brain

Qualification-goals/Competencies:

- The students can explain the basics of neurobiological function.
- The students can explain the structure and development of the CNS.
- They can explain neuronal plasticity and circuit regulation.
- They know examples for CNS-periphery crosstalk in metabolic regulation and can explain them.

Grading through:

- Oral examination

Responsible for this module:

- Prof. Dr. rer. nat. Henrik Oster

Teacher:

- Institute of Neurobiology
- Dr. rer. nat. Violetta Pilorz
- Dr. rer. nat. Isabel Heyde
- PD Dr. Misa Hirose

Literature:

- A. Robert Martin, David A. Brown, Mathew E. Diamond; Antonino Cattaneo, Francisco F. De-Miguel, and Foreword by John Nicholls: From Neuron to Brain (Sixth Edition) - December 2020; ISBN: 9781605354392
- Editors - Scott Brady, George Siegel, R. Wayne Albers, Donald Price: Basic Neurochemistry, Principles of Molecular, Cellular, and Medical Neurobiology (8th Edition) - November 2011; ISBN: 9780123749475

Language:

- offered only in English

Notes:

Prerequisites for the module:
- nothing

Prerequisites for admission to the written examination:
- succesful participation in the seminar

Module exam:
- EW4240-L1: Neurobiology, oral examination, 90 min, 100 % module grade

(Share of Institute of Neurobiology in S is 100%)
(Share of Institute of Neurobiology in V is 100%)

EW4250-KP06 - Clinical Studies 2 (Design and Analysis) (DDKS)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	6

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), interdisciplinary competence, 2nd semester
- Master Nutritional Medicine 2019 (compulsory), interdisciplinary competence, 2nd semester

Classes and lectures:

- Design and realization of clinical studies (lecture, 2 SWS)
- Design and realization of clinical studies (seminar, 1 SWS)
- Design and realization of clinical studies (exercise, 1 SWS)

Workload:

- 90 Hours private studies
- 60 Hours in-classroom work

Contents of teaching:

- What is a clinical trial Definitions/ Examples
- Different types of trial
- Ethical issues.
- Blindness.
- Planning the trial: formulation of hypotheses.
- Explanatory and pragmatic approaches: clinical trials as hypothesis testing and decision procedures.
- Choice of outcome measures and implications for analysis.
- Selecting patient populations and samples.
- Obtaining and maintaining comparable patient groups: selection, allocation and assessment biases and their avoidance.
- Allocation to treatment: simple, restricted and stratified randomisation; minimisation
- Extensions: cluster randomised trials, crossover trials, equivalence trials, factorial trials and meta-analysis.
- Introduction to Phase 2-3 Designs
- Trial Critiques.
- Superiority and non-inferiority trials
- CV-outcome studies (endpoint studies) vs. safety trials
- Drug regulatory perspectives on clinical trial design, conduct, analysis and interpretation
- Design and analysis issues in crossover trial designs
- Design and analysis issues in cluster trial designs
- Meta-analysis of clinical trial data
- Inclusion of economic evaluation in or with trial designs
- An introduction to personalised medicine

Qualification-goals/Competencies:

- Students are able to understand the principles and rationale of clinical trial design and conduct
- The students can appreciate some special problems of analysis and interpretation of clinical trials results, and the ways in which good experimental design can help avoid these
- Students can appreciate the ethical and regulatory issues surrounding clinical trials & their use in health technology assessment
- They understand specific design issues in clinical trials, including; inclusion/exclusion criteria, blinding, and randomisation
- They understand and calculate the sample size required for a clinical trial
- They are able to carry out an extended piece of statistical analysis using computer software
- They can summarise and interpret the results of a statistical analysis for both a technical and non-technical audience
- They learn to deal with real and difficult analysis issues and to appreciate no single correct solutions exist
- They have a practical understanding of the methods covered in Clinical Trials

Grading through:

- portfolio exam

Requires:

- Clinical Studies (MA2214-KP04, MA2214)

Responsible for this module:

- PD Dr. Britta Wilms

Teacher:

- Institute for Experimental Endocrinology

- MitarbeiterInnen des Instituts
- PD Dr. Britta Wilms
- Dr. Marcel Pointke

Literature:

- Brody, T: Clinical Trials: Study Design, Endpoints and Biomarkers, Drug Safety, and FDA and ICH Guidelines - Elsevier
- Friedman, L.M., Furberg, C.D., DeMets, D.L: Fundamentals of Clinical Trials - Springer

Language:

- German and English skills required

Notes:

Admission requirements for taking the module:
- None (the competences of the modules listed under 'requires' are needed for this module, but are not a formal prerequisite).

Admission requirements for taking module examination(s):
- SoSe 2021: no prerequisites
- from SoSe 2022: active participation in the exercises in small groups as specified at the beginning of the semester

Module exam(s):
- EW4250-L1: Clinical Studies 2, portfolio exam consisting of: 40 points in the form of seminar paper/excersises and 60 points in the form of a written exam, 100% of the module grade

(Share of Nutritional Medicine in V is 100%)
(Share of Nutritional Medicine in S is 100%)
(Share of Nutritional Medicine in Ü is 100%)

LS4101 A - Module part: Molecular Oncology (AMolOnk)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	2,67

Course of study, specific field and term:

- Master Molecular Life Science 2023 (module part), cell biology, 2nd semester
- Master Nutritional Medicine 2023 (module part), advanced curriculum, 2nd semester
- Master MLS 2018 (Module part of a compulsory module), cell biology, 2nd semester
- Master Nutritional Medicine 2019 (Module part of a compulsory module), advanced curriculum, 2nd semester
- Master MLS 2016 (module part), cell biology, 2nd semester

Classes and lectures:

- Molecular Oncology (lecture, 2 SWS)

Workload:

- 50 Hours private studies
- 30 Hours in-classroom work

Contents of teaching:

- Oncology from the view of the clinician (neuro-epithelial tumors)
- concepts in initiation (mutation, epigenetics, viruses, immune system), progression and therapy of tumors (melanoma, glioma, tumors of the hematopoietic system).
- molecular and biochemical processes (oncogenes, tumor suppressor genes, metabolic disturbances, link between metabolism and epigenetics) in tumors.

Qualification-goals/Competencies:

- knowledge of the general concepts in oncology
- understanding the processes in tumor initiation, tumor progression, immune evasion and relapse
- Understanding the significance of metabolic processes for tumor initiation and therapy
- Understanding the molecular and cellular features of tumors (selected examples such as glioma, melanoma, leukemia and lymphoma)

Grading through:

- written exam

Responsible for this module:

- Siehe Hauptmodul

Teacher:

- Department of Neurosurgery
- PD Dr. rer. nat. Christina Zechel

Literature:

- : Original publications and Reviews
- Schlegel et al.: Neuroonkologie - Thieme
- Wagener & Müller: Molekulare Onkologie - Thieme

Language:

- offered only in English

Notes:

MLS: part of the module MZ4101-KP08/LS4101-KP09
Nutritional Medicine: part of the module EW4200-KP08

LS4101 B - Module part: Molecular Endocrinology (BMolEndo)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	2,67

Course of study, specific field and term:

- Master Molecular Life Science 2023 (module part), cell biology, 2nd semester
- Master Nutritional Medicine 2023 (module part), advanced curriculum, 2nd semester
- Master MLS 2018 (Module part of a compulsory module), cell biology, 2nd semester
- Master Nutritional Medicine 2019 (Module part of a compulsory module), advanced curriculum, 2nd semester
- Master MLS 2016 (module part), cell biology, 2nd semester

Classes and lectures:

- Molecular Endocrinology (lecture, 2 SWS)

Workload:

- 50 Hours private studies
- 30 Hours in-classroom work

Contents of teaching:

- Hormone-secreting glands and tissues
- The prime hormonal axes
- Principples of hormone structure and function
- Hormone receptors and signal transduction
- Hormonal regulation of homeostasis
- Endocrine disruption
- Endocrine diseases and treatment options (e.g. diabetes mellitus, hypo- and hyperthyroidism, hyper- and hypofunction of the adrenal cortex, disorders of the reproductive axis, cancer)

Qualification-goals/Competencies:

- Understanding how hormone production is regulated according to selected examples (pancreas, thyroid, adrenal, adipocytes etc.)
- Understanding the mechanisms of hormonal action
- Know the underlying mechanisms for the treatment of endocrine dysfunctions

Grading through:

- written exam

Responsible for this module:

- Siehe Hauptmodul

Teacher:

- Institute of Neurobiology

- Prof. Dr. rer. nat. Henrik Oster
- PD Dr. Misa Hirose
- Dr. rer. nat. Violetta Pilorz
- Dr. rer. nat. Isabel Heyde

Literature:

- : Williams Textbook of Endocrinology - Elsevier Ltd, Oxford; Auflage: 14th Edition. (19. Dezember 2019)

Language:

- offered only in English

Notes:

MLS: part of module LS4101-KP04, LS4101-KP09, MZ4101-KP08
Nutritional Medicine: part of module EW4200-KP08.

(Share of Institute of Neurobiology in V is 100%)

LS4101 C - Module part: Molecular Biology of the Cardiovascular System (CMolkard)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	2,67

Course of study, specific field and term:

- Master Molecular Life Science 2023 (module part), cell biology, 2nd semester
- Master Nutritional Medicine 2023 (module part), advanced curriculum, 2nd semester
- Master MLS 2018 (Module part of a compulsory module), cell biology, 2nd semester
- Master Nutritional Medicine 2019 (Module part of a compulsory module), advanced curriculum, 2nd semester
- Master MLS 2016 (module part), cell biology, 2nd semester

Classes and lectures:

- Molecular Biology of the Cardiovascular System (lecture, 2 SWS)

Workload:

- 50 Hours private studies
- 30 Hours in-classroom work

Contents of teaching:

- Introduction to the anatomy, physiology and pathophysiology of the heart
- Cardiovascular diseases and nutrition
- Cardiovascular diseases and genetics
- Bioinformatic strategies in cardiovascular research
- Molecular changes and genetics in atherosclerosis
- Cell-based, organ and animal models in cardiovascular medicine
- Personalized medicine in cardiology
- Diagnostics, biomarkers and therapeutic approaches for cardiovascular diseases

Qualification-goals/Competencies:

- Acquisition of basic knowledge in the field of cardiovascular medicine
- Understanding of pathophysiological and molecular mechanisms in the development of cardiovascular diseases
- Insights into personalized medicine and therapeutic approaches in cardiovascular medicine

Grading through:

- written exam

Responsible for this module:

- Siehe Hauptmodul

Teacher:

- Medical Clinic II
- Institute of Cardiogenetics

- Prof. Dr. rer. nat. Tanja Zeller
- Dr. hum. biol. Zouhair Aherrahrou
- Prof. Dr. med. Joachim Weil
- Ph.D. Redouane Aherrahrou
- Dr. rer. nat. Amer Ghalawinji
- Dr. rer. nat. Stephanie Tennstedt
- Prof. Dr. rer. nat. Jorge Duque Escobar
- Dr. rer. nat. Olga Schweigert
- Dr. med. Teng Tong
- Dr. med. Elias Rawish
- Dr. med. Tobias Graf
- Dr. rer. nat. Tobias Reinberger

Literature:

- Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine: ISBN 1416041060 / 9781416041061 · 2304 Pages · 1500 Illustrations, Saunders · 8th edition published November 2007
- Baars, H.F., Doevendans, P.A.F.M., Houweling, A., van Tintelen, J.P.: Clinical Cardiogenetics - ISBN 978-3-319-44203-7 (2016)

Language:

- offered only in English

Notes:

MLS: part of module MZ4101-KP08 / LA4101-KP09.
Nutritional Medicine: part of module EW4200-KP08.

LS4101 G - Module part G: Neuroendocrinology (GNeuroend)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	2,67

Course of study, specific field and term:

- Master Molecular Life Science 2023 (module part), neuroscience, 2nd semester
- Master Nutritional Medicine 2023 (Module part of a compulsory module), advanced curriculum, 2nd semester
- Master MLS 2018 (Module part of a compulsory module), cell biology, 2nd semester
- Master Nutritional Medicine 2019 (Module part of a compulsory module), advanced curriculum, 2nd semester
- Master MLS 2016 (module part), neuroscience, 2nd semester

Classes and lectures:

- LS4107-V: Neuroendocrinology (lecture, 2 SWS)

Workload:

- 50 Hours private studies
- 30 Hours in-classroom work

Contents of teaching:

- introduction into neuroendocrinology
- hypothalamo-pituitary-system
- adrenal glands/glucocorticoids
- animal experimental methodology
- thyroid hormones centralnervous aspects
- corticotropin releasing factor and other neuropeptides in the CNS
- adipokines interactions of peripheral signals with the CNS
- endocrine rhythms
- energy homeostasis

Qualification-goals/Competencies:

- students will acquire basic knowledge of neuroendocrinology
- they understand the interaction of selected central nervous and peripheral (neuro)endocrine systems (energy homeostasis, adrenals/glucocorticoids) and can transfer this knowledge to practical applications
- they recall and understand experimental methods and are able to apply them in experiments
- they can analyse and interpret research results and publications

Grading through:

- written exam

Responsible for this module:

- Siehe Hauptmodul

Teacher:

- Institute for Experimental Endocrinology
- Institute of Neurobiology
- Institute for Biology

- Dr. rer. nat. Carla Schulz
- Prof. Dr. rer. nat. Henrik Oster
- Prof. Dr. rer. nat. Jens Mittag

Literature:

- David O. Norris and James A. Carr.: Vertebrate Endocrinology - Academic Press; 5 edition
- : additional literature will be supplied in the course of the seminar

Language:

- German, except in case of only English-speaking participants

Notes:

MLS: part of the module LS4101-KP08 / 4101-KP09.
Nutritional Medicine: part of the module EW4200-KP08.

MZ4121-KP06 - Biology of Infections (Infek)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	6

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (optional subject), Infection Biology, 2nd semester
- Master Molecular Life Science 2023 (optional subject), Infection Biology, 2nd semester
- Master MLS 2018 (optional subject), Infection Biology, 2nd semester
- Master MLS 2016 (optional subject), cell biology, 2nd semester

Classes and lectures:

- Specific Topics of Infection Biology (lecture, 2 SWS)
- Specific Topics of Infection Biology (seminar, 2 SWS)

Workload:

- 120 Hours private studies
- 60 Hours in-classroom work

Contents of teaching:

- Infectious diseases, viral, prokaryotic and eukaryotic infectious agents, parasites, zoonotic diseases
- Molecular mechanisms of antimicrobial chemotherapy, mechanisms of resistance against antiviral and antibacterial drugs
- Intracellular pathogens, molecular mechanisms of intracellular survival, Mycobacteria
- Antimicrobial immune mechanisms, compartments and regulation of antimicrobial defence, allergy
- Immune therapy and vaccination, mechanisms of the induction of specific T-cell and B-cell mediated protective immunity, adjuvants, DNA vaccines
- Experimental techniques in the infection biology, in vitro and ex vivo methods, experimental animal models of infectious diseases, gene knock-out mice, gene manipulated infectious agents
- Immune deficiencies, immunosuppressive chemotherapy and its consequences, retroviruses, HIV-AIDS
- Epidemiology of infectious diseases, zoonoses

Qualification-goals/Competencies:

- Detailed knowledge of infectious agents, infectious diseases and their pathomechanisms
- Detailed understanding of antimicrobial defence mechanisms at the cellular and molecular level. Understanding the mechanisms of vaccination and immune deficiencies.
- Knowledge of in vivo and in vitro techniques of infection biology.
-

Grading through:

- oral presentation
- written exam

Responsible for this module:

- Prof. Dr. med. Jan Rupp

Teacher:

- Department of Infectiology
- Research Center Borstel, Leibniz Lung Center
- Institute of Virology and Cell Biology
- Institute of Medical Microbiology

- Prof. Dr. med. Jan Rupp
- Dr. rer. nat. Tobias Dallenga
- Dr. rer. nat. Christoph Hölscher
- PD Dr. rer. nat. Norbert Reiling
- Dr. rer. nat. Bianca Schneider
- Prof. Dr. med. Tanja Lange
- Prof. Dr. rer. nat. Stefan Niemann
- Prof. Dr. rer. nat. Markus Hoffmann, Dr. med.
- Dr. rer. nat. Matthias Hauptmann
- Prof. Dr. rer. nat. Matthias Merker
- Samyr Kenno, PhD
- Prof. Dr. rer. nat. Stefan Taube

Literature:

- Basics and new papers:

Language:

- offered only in English

Notes:

Prerequisites for the module:
- nothing

Prerequisites for admission to the written examination:
- succesful participation in the seminar

Module exam:
- MZ4121-L1: Infection Biology, written exam, 60 min, 75% module grade
- MZ4121-L2: Infection Biology seminar, Seminar lecture, 25% module grade

MZ4126-KP06 - Clinical Neurobiology (ClinNeuro)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	6

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (optional subject), neuroscience, 2nd semester
- Master Molecular Life Science 2023 (optional subject), neuroscience, 2nd semester

Classes and lectures:

- Neuroscience 2 (lecture, 2 SWS)
- Neuroscience 2 (seminar, 2 SWS)

Workload:

- 120 Hours private studies
- 60 Hours in-classroom work

Contents of teaching:

- Alzheimer's disease
- Infections of the CNS
- Neural stem cells and neurodegenerative disease
- Neural stem cells and tumor stem cells in brain tumors
- Neurobiology of cerebral ischemia
- Brain channelopathies: epilepsy and ataxia
- Neurogenetic disorders
- Neuroimmunology of multiplesclerosis
- Neurometabolic disorders
- Neuropathies
- Molecular basis of Parkinson disease and other movement disorders
- Schizophrenia

Qualification-goals/Competencies:

- Introduction to neuronal stem cells
- Introduction to various neuropathological diseases
- Understanding molecular mechanisms of neuropathological diseases

Grading through:

- written exam

Responsible for this module:

- Prof. Dr. med. Markus Schwaninger

Teacher:

- Department of Neurosurgery
- Department of Neurology
- Institute of Experimental and Clinical Pharmacology and Toxicology

- Prof. Dr. med. Markus Schwaninger
- Prof. Dr. rer. nat. Katja Lohmann
- PD Dr. Sc. Ana Westenberger
- Prof. Dr. rer. nat. Olaf Jöhren
- Prof. Dr. rer. nat. Enrico Leipold
- PD Dr. med. Harald Krenzlin
- Dr. Deepak Ailani

Literature:

- Purves D, Augustine G, Fitzpatrick D, Hall W, LaMantia A: Neuroscience - Oxford University Press; 6. Edition (25. September 2018) - ISBN-10: 160535841X
- : Original publications and Reviews

Language:

- English, except in case of only German-speaking participants

Notes:

Prerequisites for the module:
- nothing

Prerequisites for admission to the written examination:
- Regular and successful participation in the seminar

Module exam:
- MZ4125-L1: Clinical Neurobiology, written exam, 90 min, 100 % module grade

EW5100-KP18 - Practical Course Nutritional Medicine (BP_NM)

Duration:	Turnus of offer:	Credit points:
1 Semester	each semester	18

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), Nutritional Sciences, 3rd semester
- Master Nutritional Medicine 2019 (compulsory), Nutritional Sciences, 3rd semester

Classes and lectures:

- Practical Course (block practical course, 24 SWS)

Workload:

- 360 Hours in-classroom work
- 120 Hours private studies

Contents of teaching:

- Two practical courses with 2 different skills are to acquire. One term must have 3 month labwork, the other 8 to 12 weeks labwork.

Qualification-goals/Competencies:

- Ability to applicate knowledge of the first and second semester of the master course in practice and deepening of the experimental skills
- Absorbing knowledge in documentation and presentation of scientific data (poster presentation and talk)
- Ability to work in a team
- Getting lab experiences by working on real research projects

Grading through:

- Poster

Responsible for this module:

- Prof. Dr. rer. nat. Martin Smollich

Teacher:

- Institutes and hospitals of the University of Lübeck
- Dozentinnen/Dozenten der UzL

Literature:

- : - Textbooks, protocols, review articles, publications

Language:

- offered only in English

Notes:

Admission requirements for taking the module:
- most of the modules of the first and second semester have been successfully passed.

Admission requirements for the module examination(s):
- succesful participation in the practical course

Module examination(s) until winter term 22/23:
- EW5100-L1: Internship 1, poster presentation, 30 min, 33,4 % module grade, practical grade from the lab 16,7 % of module grade.
- EW5100-L2: Internship 2, oral presentation, 20 min, 33,4 % module grade; practical grade from the lab 16,7 % of module grade.

Module examination(s) starting with winter term 22/23:
For internships taking place entirely in the winter term 22/23 or having been registered in winter term 22/23 the grade is calculated as follows:
- EW5100-L1: Internship 1, poster presentation with two examinars, 30 min, 50 % module grade (25% per examiner).
- EW5100-L2: Internship 2, oral presentation with two exam, 20 min, 50 % module grade (25% per examinant).

The practical course can run at the University of Lübeck, at other Universities in Germany or foreign countries, at research center or at companies. The Minimum of one of the three courses (PC 1, 2 or Masterthesis) must be passed at the University of Lübeck.

The length of the interships is stated in the SGO (Studiengangsordnung) for the Master Nutritional Medicine 2023.

EW5200-KP06 - Consolidating in Nutritional Medicine (ConsoleNM)

Duration:	Turnus of offer:	Credit points:
1 Semester	each winter semester	6

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), advanced curriculum, 3rd semester
- Master Nutritional Medicine 2019 (compulsory), advanced curriculum, 3rd semester

Classes and lectures:

- See LS5200... (depends on the chosen courses, 2 SWS)

Workload:

- 120 Hours private studies
- 60 Hours in-classroom work

Contents of teaching:

- See special plan of the course located on the Nutrional Medicine website.

Qualification-goals/Competencies:

- Ability, to understand and reproduce the specific knowledge of the topics described in the individual modules.

Grading through:

- as announced by examiner

Responsible for this module:

- Prof. Dr. rer. nat. Martin Smollich

Teacher:

- Universitätsklinikum S-H
- Research Center Borstel, Leibniz Lung Center
- All institutes of the University of Lübeck
- Alle Dozentinnen/Dozenten der UzL

Language:

- English, except in case of only German-speaking participants

Notes:

Prerequisites for the module:
- most of the modules of the first and second semester have been passed

The seminars must run at the University of Lübeck.

EW5410-KP06 - Scientific writing in Nutritional Medicine (SW)

Duration:	Turnus of offer:	Credit points:
1 Semester	each summer semester	6

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), interdisciplinary competence, 4th semester
- Master Nutritional Medicine 2019 (compulsory), interdisciplinary competence, 4th semester

Classes and lectures:

- Design and analysis of scientific publications (lecture, 2 SWS)
- Scientific writing (seminar, 2 SWS)

Workload:

- 90 Hours private studies
- 60 Hours in-classroom work

Contents of teaching:

- Publication of scientific studies, including structuring and writing of a scientific article, scientific journals and their procedures
- Design of scientific studies from an ethical and statistical viewpoint, ethical approval for animal and human studies
- Peer review process, including critical analysis of publications and studies, post publication peer review
- Scientific misconduct, the legal framework of research, good scientific practice, retractions
- Different forms of scientific writing, including poster and power point presentations or grant applications

Qualification-goals/Competencies:

- The students will be able to critically assess the design of scientific studies, including the ethical, statistical and legal framework
- They can critically assess published work of other authors and discuss the scientific content.
- They can assemble data for a scientific publication and draft the written framework for such a manuscript.

Grading through:

- Written report

Responsible for this module:

- Prof. Dr. rer. nat. Jens Mittag

Teacher:

- Institute for Experimental Endocrinology
- Prof. Dr. rer. nat. Jens Mittag

Literature:

- :

Language:

- offered only in English

Notes:

Admission requirements for taking the module:
- none

Admission requirements for the module examination(s):
-none

Module examination(s):
- EW5410-L1: Scientific Writing in Nutritional Medicine, term paper, 100% of the grade

Grading: Written manuscript of a scientific article (80% of the grade) and peer review of another author s work (20% of the grade)within the given deadlines

EW5900-KP30 - Master Thesis (MScTheMN)

Duration:	Turnus of offer:	Credit points:
1 Semester	each semester	30

Course of study, specific field and term:

- Master Nutritional Medicine 2023 (compulsory), Nutritional Sciences, 4th semester
- Master Nutritional Medicine 2019 (compulsory), Nutritional Sciences, 4th semester

Classes and lectures:

- Practical work (autonomous practical studies , 39 SWS)
- Authoring of the Master Thesis (supervised self studies, 5 SWS)
- Colloquium (presentation (incl. preparation), 1 SWS)

Workload:

- 900 Hours research for and write up of a thesis

Contents of teaching:

- Scientific project in the field of molecular life sciences, nutritional sciences and nutritional medicine

Qualification-goals/Competencies:

- Ability to solve a preformulated simple scientific problem mostly in a defined period of time and to present the experimental results with regard to the roles of Good Scientific Practice (GSP) of the University of Lübeck and of the DFG-guidelines.
-

Grading through:

- written exam, oral presentation, and defence of the experiment´s results

Responsible for this module:

- Studiengangsleitung

Teacher:

- Institutes of the Unversity of Lübeck
- Alle prüfungsberechtigten Dozentinnen/Dozenten des Studienganges

Literature:

- : - will be announced by the lecturer

Language:

- English, except in case of only German-speaking participants

Notes:

Prerequisites: Minimum of 70 ECTS.
If the Master thesis is done externally (outside our university) the student has to choose a licensed lecturer (see PO) of our university as a second instructor who will be First Examiner in the examination.