Short Methods Courses, Professional Skills, Industry Excursions 2009

The following courses and further activities are offered to PhD students of the Göttingen Graduate School for Neurosciences and Molecular Biosciences (GGNB) and to students of the Weizmann Institute of Science (WIS). All courses will be offered between March and December 2009 unless indicated otherwise. Some of the courses will be offered more than once per year. For many courses, the exact date will be fixed in agreement with the participants as soon as their participation has been confirmed.

A Overview

Short Methods Courses

Supervisor(s) (ID / Credits)	Title of Course
Bähr, Lingor (A 01 / 1 credit)	Introduction to animal experiments
Bayer, Wirths (A 02 / 1 credit)	Alzheimer's disease: Behavioural and neuropathological analysis of transgenic mouse models
Bennati, Tkach, Türk (A 03 / 1 credit)	EPR-Spectroscopy
Borchers (A 04 / 1 credit)	Time-lapse imaging of migrating neural crest cells
Brembeck (A 05 / 1 credit)	Basic anatomy and tissue processing of genetically engineered mouse models
Brenig, Schütz (A 06 / 1 credit)	Genotyping using FRET on the LightCycler
Brenig (A 07 / 1 credit)	Fragment analysis and Sanger DNA sequencing using the ABI3100
Brose, Varoqueaux, Soykan (A 08 / 1 credit)	Hippocampal neurons primary culture and transfection
Cordes, Krull (A 09 / 1 credit)	Preparation of *Xenopus laevis* nuclear envelopes and their analysis by field emission scanning electron microscopy
Dobbelstein, Bug, Marinoglou (A 10 / 1 credit)	Assessing promoter activity by luciferase assays
Dobbelstein, Köpper, Zhang (A 11 / 1 credit)	Polymerase Chain Reaction I and advanced applications.
Ehrenreich, Begemann, Bartels (A 12, 2 credits per block)	Translational Neuroscience
Eichele, Miletic (A 13 / 1 credit)	Mouse histology *& in situ* expression analyses
Fasshauer, Burkhardt, Demircioglu (A 14 / 1 credit)	Protein-protein interactions in membrane traffic
Fasshauer, Kienle (A 15 / 1 credit)	Introduction to bioinformatic tools
Feußner, Goebel (A 16 / 1 credit)	Introduction to lipid analysis
Fischer, Hammerschmidt, Keller (A 17 / 1 credit)	Introduction to bioacoustic field methods: from recordings to statistics
Gail, Treue (A 18 / 1 credit)	Non-invasive probing of brain function – Introduction to psychophysics
Gatz, Fode (A 19 / 1 credit)	Chromatin immunoprecipitation (ChIP)
Geisel, Nagler, Witt, Tchumatchenko (A 20 / 1 credit)	How does Nature generate Time Series? Time Series Analysis and Modeling for Dummies
Geisel, Timme, Wolf (A 21 / 1 credit)	Theoretical and Computational Neuroscience: Collective Dynamics Biological Neural Networks I
Geisel, Timme, Wolf (A 22 / 1 credit)	Theoretical and Computational Neuroscience: Collective Dynamics Biological Neural Networks II
Görlich, Samwer (A 55 / 1 credit)	Purification and identification of fungal toxins
Großhans, Kanesaki (A 23 / 1 credit)	Multi-colour time-lapse imaging of cells and embryos
Grubmüller, Lakämper (A 24 / 1 credit)	Introduction to Molecular Dynamic Simulation

Grubmüller, Schmidt (A 25 / 1 credit per semester)	Lecture Series "Current Topics in Biophysics"
Grubmüller, Schmitt, de Groot (A 26 / 1.5 credits)	Computational Biophysics I
Grubmüller, Schmitt, de Groot (A 27 / 1.5 credits)	Computational Biophysics II
Hahn, Nitzki (A 28 / 1 credit)	In situ hybridisation of paraffin embedded tissue sections
Hanisch (A 29 / 1 credit)	Activity-controlled purification of a protein by HPLC techniques
Hanisch (A 30 / 1 credit)	Preparation and characterization of primary (micro)glial cultures
Heinrich (A 31 / 1.5 credits)	Neuronal basis of acoustic communication in insects (II): Control of sound production
Höbartner, (A 32 / 1 credit)	Chemical synthesis and enzymatic ligation of RNA and DNA oligonucleotides
Jahn, van den Bogaart, Holt (A 33 / 1 credit)	Biochemical analysis of SNARE-mediated membrane fusion
Jahn, Schmitt (A 34 / 1 credit)	Molecular biology of yeast: Applications of the "Tandem Affinity Purification" tag in yeast with wild type and mutant background
Jahn, Chua, Boyken (A 35 / 1 credit)	Co-immunoprecipitation as a technique to study protein-protein interactions
Jahn, Kühnel, Schalk (A 36 / 1 credit)	Basic techniques in protein purification and characterization
Jakobs, Grotjohann, Brakemann (A 37 / 1 credit)	PCR based mutagenesis strategies to evolve (photoswitchable) fluorescent proteins
Johnsen (A 38 / 1 credit)	Use of chromatin immunoprecipitation for the analysis of transcription factor binding *in vivo* in cultured mammalian cells
Kehlenbach (A 39 / 1 credit)	Analysis of nucleocytoplasmic transport by flow cytometry
Luther, Parlitz (A 40 / 6 credits)	Nonlinear Dynamics and Time Series Analysis
Moser, Antal, Strenzke (A 41 / 1 credit)	Auditory and visual evoked potential
Moser, Göpfert, Fiala, Wolf. Schild (A 42 / 0.5 credits)	Fundamental Principles of Sensory Processing
Müller, Vink (A 43 / 2 credits)	Computer simulation methods in statistical physics
Nave, Möbius (A 44 / 1 credit)	Subcellular localization of proteins by immunoelectron microscopy of cryosections
Nave, Rossner (A 45 / 1 credit)	Microdissection combined with RNA analysis in the brain
Olympus – Bodenschatz lab (A 46 / 1 credit)	Theory and basics of fluorescence microscopy and imaging / Introduction to life science research applications FRET, FRAP, FLIM, caging–uncaging, GFP, Fluorescence microscopy of living cells
Oster (A 47 / 1 credit)	Real-time luminescence recordings in organotypic slice cultures
Paulus, Antal (A 48 / 1 credit)	Transcranial magnetic- and direct current stimulation
Pieler, Koebernick (A 49 / 1 credit)	Analysis of embryonic gene expression (whole mount in situ hybridization, RT-PCR)
Pieler, Claußen (A 50 / 1 credit)	Analysis of RNA-protein interactions
Pieler, Henningfeld (A 51 / 1 credit)	Gene regulation in *Xenopus*
Polle, Kopka (A 52 / 1.5 credits)	Transport processes and imaging with radionucleotides
Rehling (A 53 / 1 credit)	Blue-native PAGE analysis of membrane protein complexes
Reichardt, van den Brandt (A 54 / 1 credit)	Analysis of T cell development by FTOC (fetal thymic organ culture) and FACS (fluorescence-activated cell sorting)
Shcherbata (A 56 / 1 credit)	Introduction to basic histology techniques
Sheldrick (A 57 / 3 credits)	Methods in Chemistry II: Diffraction methods
Sheldrick (A 58 / 1.5 credits)	Advanced crystal structure analysis
Simons (A 59 / 1 credit)	GFP proteins and their application (FRAP, FRET, photo activation)
Stadelmann-Nessler (A 60 / 1 credit)	Non-radioactive in situ hybridization

Stark (A 61 / 1 credit)	3D structure determination of macromolecular complexes by single particle cryo-EM
Steinem, Janshoff (A 62/ 1 credit)	Atomic force microscopy of surfaces: basic imaging techniques and data analysis
Stühmer, Pardo (A 63/ 1 credit)	Patch Clamp
Tittmann, Lüdtke, Belter (A 64 / 1 credit)	Principles and methods of protein purification by chromatography
Tittmann, Lüdtke, Fanghänel (A 71 / 1 credit)	Thermodynamic characterization of biomolecular interactions by isothermal titration calorimetry
Urlaub, Schmidt, Hsiao, Richter (A 65 / 1 credit)	Sequence analysis of proteins and their post-translational modifications by MALDI-ToF and electrospray ionization (ESI) mass spectrometry
Walter, Kruse (A 66 / 1 credit)	Isolation of recombinant proteins by affinity chromatography and binding studies
Walter, Brameier (A 67 / 1 credit)	Introduction to Bioinformatics Methods
Walter, Gruber (A 68 / 1 credit)	Mechanisms of RNA silencing
Wimmer, Bucher (A 69 / 1 credit)	Parental RNAi in *Tribolium*
Wodarz, Halbsgut (A 70 / 1 credit)	Confocal microscopy on whole mount preparations of *Drosophila* embryos

Professional Skills / Language Courses

Trainer	**Title of Course**
Heather Silyn-Roberts (S 01 / 1.5 credits)	Effective scientific communication: journal papers, seminar or conference presentations, and posters
Volker Grimm (S 02/0.5 credits)	Scientific writing
Anke Wagner (S 03/0.5 credits)	Poster design and presentation
Janet Yagoda Shagham (S 04 / 3 credits)	Science and medical writing for the public
Alexia & Stephan Petersen (S 05 / 1 credit)	Working across borders, communicating across cultures I: An introductory workshop to intercultural communication for Graduate Students
Alexia Petersen (S 06 / 1 credit)	Working across borders, communicating across cultures II: Creating intercultural synergy in multicultural teams Advanced Intercultural Communication Seminar for Graduate Students
Simon Golin (S 07 / 0.5 credits)	Project management for young scientists
Simon Golin (S 08 / 0.5 credits)	Time management in doctoral research: Aligning time and goals
Simon Golin (S 09 / 0.5 credits)	Team work & leadership competencies in academia and beyond
Christina Schütte (S 10 / 0.5 credits)	Grant writing for scientists
Christian Lenk (S 11 / 1 credit)	Bioethics in Science and Research
Bernd Seilheimer – Bayer Schering Pharma AG (S 12 / 2 credits)	The drug discovery process
Sabine Gildemeister (S 13 / 1 credit)	Speed reading techniques I
Sabine Gildemeister (S 14 / 1 credit)	Speed reading techniques II
Ralf Petri (S 15 / 1 credit)	Job hunting, interview skills and assessment centers
Lektorat Deutsch als Fremd-sprache (S 16 / 2 credits)	German language intensive courses – Level A0 (4 h/day: Sep/Oct)
Lektorat Deutsch als Fremd-sprache (S 17 / 2 credits)	German language intensive courses – Level A1 (4 h/day: Sep/Oct)
Lektorat Deutsch als Fremd-sprache (S 18 / 2 credits)	German language intensive courses – Level B (4 h/day: Sep/Oct)

Lektorat Deutsch als Fremd-sprache (S 19 / 2 credits)	German language intensive courses – Level C (4 h/day: Sep/Oct)
Lektorat Deutsch als Fremd-sprache (S 20/ 1credit/module)	German language weekly courses – Level A0 (2 h/week: 3 modules)
Lektorat Deutsch als Fremd-sprache (S 21/ 1 credit/module)	German language weekly courses – Level A1 (2 h/week: 3 modules)
Lektorat Deutsch als Fremd-sprache (S 22/ 1 credit/module)	German language weekly courses – Level B (2 h/week: 3 modules)
Lektorat Deutsch als Fremd-sprache (S 23/ 1 credit/module)	German language weekly courses – Level C (2 h/week: 3 modules)

Industry Excursions

Company	**Location (Date)**
BASF (X 01 / 0.5 credits)	Ludwigshafen / Heidelberg
Boehringer Ingelheim (X 02 / 0.5 credits)	Biberach an der Riß / Ulm
Bayer Schering (X 03 / 0.5 credits)	Berlin (Dr. Seilheimer)
Sartorius (X 04 / 0.5 credits)	Göttingen

Contact the GGNB office for further details (ggnb@gwdg.de)

B Course Details

B.1 Advanced Methods Courses

Mathias Bähr, Paul Lingor

A 01 - Introduction to animal experiments

Date: tbd

Place: S-2 Virus Lab, Waldweg 33, Basement

No. of participants: min. 2, max. 6

Duration: 2 days

Time on Day 1: 09:00

Preparatory meeting: none

Short description: Various animal models are widely being used in the life sciences and medical research. Eventually, these models can also be used to study disease prevention and treatment. Students will select different brain regions in rats and calculate the respective coordinates for surgery. They will inject various substances (AAV, Fluorogold, 6-OH dopamine) into specific brain regions using stereotaxic equipment. Students will perfuse the rats and remove the brain to completely fix it.

Students will also be taught to inject different substances (rAAV, dyes) into the intravitreal space of the rat eye. They will transect the optic nerve, without damaging the blood supply to the retina. Later, the students can remove the eye ball and prepare it for sectioning or can remove the retina and whole mount it for immediate examination. Students will have the opportunity to slice the brain and eyeball using the cryostat machine. Students will also be involved in processing tissue sections for immunohistochemistry.

Contact: Dr. Paul Lingor, Tel. 0551 - 39 14343, plingor@gwdg.de

Thomas Bayer, Oliver Wirths

A 02 - Alzheimer's disease: Behavioural and neuropathological analysis of transgenic mouse models

Date: tbd (May 2008)

Place: Molecular Psychiatry Lab, Dept. of Psychiatry, von-Siebold-Str. 5, Basement

No. of participants: min. 2, max. 4

Duration: 2 days

Time on day 1: 09:30

Preparatory meeting: no, short seminar on day 1

Short description: Transgenic mouse models have been proven to be valuable research tools to facilitate our understanding of the pathological alterations in Alzheimer's disease (AD) and are indispensable in the development of new therapeutic treatment strategies. Students will be introduced to different AD mouse models, will prepare brain tissue for histochemical analyses and will carry out immunostainings for relevant neuropathological markers. In addition, they will be introduced into mouse behavioural experiments and will learn to conduct simple motor and learning performance tasks.

Contact: Dr. Oliver Wirths, 0551 – 39 -10290, owirths@gwdg.de

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Marina Bennati, Maria Teresa Türke, Igor Tkach

A 03 - EPR-Spectroscopy

Date: September 2009

Place: Max-Planck-Institut für biophysikalische Chemie, AG Elektronenspinresonanz-Spektroskopie, Am Fassberg 11

No. of participants: min. 2, max. 5-6

Duration: 2-3 days

Time on Day 1: tbd

Preparatory meeting: none

Short description: Investigation of protein structure by EPR spectroscopy and site directed spin labeling.

Please note: Basic knowledge in spectroscopy is required

Contact: Maria Teresa Türke (mtuerke@gwdg.de), Dr. Igor Tkach (igor.tkach@mpibpc.mpg.de)

Annette Borchers

A 04 - Time-lapse imaging of migrating neural crest cells

Date: tbd

Place: Dept. of Developmental Biochemistry, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: 2

Duration: 2-3 days

Time on Day 1: tbd

Preparatory meeting: none

Short description: In this course *Xenopus laevis* embryos will be injected with RNA coding for fluorescently labeled proteins. At neurula stages neural crest explants will be prepared and neural crest migration will be

analyzed by time-lapse imaging. Time permitting we will use gain- and loss-of-function approaches to manipulate neural crest migration.

Contact: Annette Borchers, annette.borchers@gmail.com, 0551 39-14615,
http://www.gzmb.uni-goettingen.de/faculty/f_borchers.html

Felix H. Brembeck

A 05 - Basic anatomy and tissue processing of genetically engineered mouse models

Date: tbd

Duration: 2 days

Time on Day 1: 10:00

Preparatory meeting: none

Short description: Genetic mouse models are widely used to study gene function during development or in the initiation or progression of tumors. Our laboratory is analyzing different genetic tumor models to analyze the development of intestinal and breast cancer.

On the first day, participants of this course will have the opportunity to perform a complete necropsy of genetically engineered mice. They will gain insight in the gross anatomy of internal organs and how to dissect, fix and prepare them for subsequent analysis. Whole mount mammary gland tissues will be prepared, stained with carmine and embedded on the second day. These whole mount stainings will be evaluated for the morphology and the presence of (pre-)malignant transformations.

Contact: Prof. Dr. Felix H. Brembeck, 0551 – 39 – 12881, e-mail: brembeck@med.uni-goettingen.de

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Bertram Brenig, Ekkehard Schütz

A 06 - Genotyping using FRET on the LightCycler

Date: tbd

Place: Institute of Veterinary Medicine, Burckhardtweg 2, 37077 Göttingen

Number of participants: min. 2, max. 4

Duration: 2 days

Preparatory meeting: none

Short description: Participants will understand the chemical and physical background of FRET in the context of nucleic acid hybridization. The special case of hybridization probes that lead to FRET will be shown and the prediction of assay performance will be shown. Real-time PCR with fluorescence monitoring of probe melting curves for detection of variants in genes, such as single nucleotide polymorphisms and different techniques of multiplexing are given as examples and the value of *in-silico* design of probes is shown.

The beneficial use of well parameterized model calculations for molecular haplotyping with loci-spanning probes will be discussed.

Contact: Dr. Ekkehard Schütz, email: eschuetz@mac.com, Tel. 0551 – 39 13964

Bertram Brenig

A 07 - Fragment analysis and Sanger DNA sequencing using the ABI3100

Date: tbd

Place: Institute of Veterinary Medicine, Burckhardtweg 2, 37077 Göttingen

Number of participants: min. 2, max. 4

Duration: 3 days

Preparatory meeting: none

Short description: Fragment analysis is an important methodology in spieces identification, parentage control, forensic medicine, and other applications, e.g. QTL studies. In most cases highly variable regions of a genome (microsatellite, SRS) are amplified and then subjected to gel-/or capillary electrophoresis. Participants will be introduced to and perform PCR protocols for the amplification of microsatellite markers (multiplex reactions). Amplicons will be analysed on an ABI3100 Genetic Analyzer and profiles evaluated

Contact: Prof. Bertram Brenig, email: bbrenig@gwdg.de, tel. 39-3383

Nils Brose, Frederique Varoqueaux, Tolga Soykan

A 08 - Hippocampal neurons primary culture and transfection

Date: tbd

Place: MPI-em, Dept. of Molecular Neurobiology

Number of participants: min. 2, max. 3

Duration: 1.5 - 2 days

Preparatory meeting: none

Short description:

Day 1: Preparation of hippocampal neurons from newborn rats. Lipofectamine transfection with fluorescently-tagged constructs.

Day 2 (half): Observation of transfected neurons.

Contact: Dr. Frédérique Varoqueaux, Tel. 0551 - 3899 688, Varoqueaux@em.mpg.de

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Volker Cordes, Sandra Krull

A 09 - Preparation of Xenopus laevis nuclear envelopes and their analysis by field emission scanning electron microscopy

Date: tbd

Place: Department of Cellular Logistics, MPI-bpc, T3, 3rd floor

Number of participants: min. 2, max. 3

Duration: 3 days

Preparatory meeting: none

Short description: Modern field emission in-lens scanning electron microscopes (FEISEMs) allow for three-dimensional analyses of biological structures at a resolution of less than a few nanometers, provided that the sites of interest can be made accessible for the scanning electron beam. The large-sized nuclei of amphibian oocytes and their nuclear envelopes (NEs) represent specimens well suitable for such high-resolution analysis. On day 1 of this course, participants will manually isolate and dissect nuclei from the South African clawed frog *Xenopus laevis* in order to obtain NEs that they will further process for EM. After having completed all steps of the specimen preparation procedure by the end of day 2, the participants will then analyze their samples in a FEISEM on day 3 and visualize the distinct morphological features characteristic for the NE's cytoplasmic and nuclear side.

Contact: PD Dr. Volker Cordes, Tel. 0551-2012404, vcordes@gwdg.de

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Matthias Dobbelstein, Monika Bug, Konstantina Marinoglou

A 10 - Assessing promoter activity by luciferase assays

Date: tbd (between June and August 2009)

Place: Department of Molecular Oncology

No. of participants: min. 3, max. 6

Duration: 2 days, each time in the morning

Time on Day 1: 10:00 a.m.

Preparatory meeting: none, short seminar on Day 1

Short description: Reporter assays are commonly used to determine the activity of a promoter and in particular its response to specific transcription factors. Luciferase reporters provide a particularly wide linear range and can therefore be used to quantify the activity of weak and strong promoters with accuracy. The use of different luciferase species allows the determination of two different promoter activities simultaneously, e. g. to provide an internal control.

On the first day, we will discuss the opportunities and limitations of transient reporter assays, and we are going to transfect cells with combinations of reporter plasmids and expression plasmids for transcription activators. On the second day, we are going to determine luciferase activities (firefly and renilla) using a dual assay, by semi-automated luminometry. The results will be discussed and different modes of measurement will be explained. Participants are welcome to bring their own promoter constructs if desired, but a brief discussion in advance would be helpful.

It is anticipated that this course will be moved to the basic set of courses in the master program during the years to come. We are then planning to offer an advanced course in the use of automated microscopy in high content, cell based assays.

Contact: Monika Bug, Tel. 0551 – 39 13841, mbug@gwdg.de, Konstantina Marinoglou, Tel. 0551 – 39 13841, kmarino@gwdg.de

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Matthias Dobbelstein, Frederik Köpper, Xin Zhang

A 11 – Polymerase Chain Reaction I and advanced applications

Date: tbd (flexible; on demand)

Place: Department of Molecular Oncology, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: min. 4, max. 10

Duration: 2 days

Time on Day 1: 10:00

Preparatory meeting: none

Short description: Polymerase chain reaction and applications, reverse transcription, oligonucleotide-directed mutagenesis, first steps towards quantitative PCR, DNA sequencing.

Contact: Frederik Koepper, f.koepper@web.de / Xin Zhang, xzhang1@gwdg.de

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Hannelore Ehrenreich, Martin Begemann, Claudia Bartels

A 12 – Translational Neuroscience

Date: 3 blocks of 3 days each in June, November, and January, Friday through Sunday

Place: MPI for Experimental Medicine, Division of Clinical Neuroscience

No. of participants: min. 6, max. 18

Duration: 3 days per block, 3 blocks total

Time: Fri/Sat: 8:00-18:00, Sun: 10:00-16:00 h

Preparatory meeting: none; but written test (multiple choice) at the end of each block

Target Group: Interdisciplinary approach, addressing medical students in the clinical part of their studies as well as students of biology and psychology at a progressed state of their studies (at least semester 5); all lectures will be in English.

General Outline: A total of 78 hours will be provided, covering translational neuroscience, presented in 3 blocks á 26 hours. Each block comprises a large area of translational neuroscience under the umbrella of one specific disease, thereby delivering an exemplary guideline for teachers and students: (1) Schizophrenia as an example of diseases affecting higher brain functions; (2) Multiple Sclerosis as an example of an inflammatory degenerative disease of the nervous system; (3) Amyotrophic Lateral Sclerosis (ALS) as an example of a rapidly fatal degenerative disease of the nervous system. *More blocks are under planning (Affective Disorders, Autism, Addiction)*

Content:

Block 1: Schizophrenia

Introduction to the disease, historical aspects, epidemiology, patient presentation (including videos), DSM criteria for the diagnosis, frequent comorbidities, including drug abuse and associated problems, important differential diagnoses, neuroimaging, neuropsychology, psychopathology, instruments for clinical rating of disease severity and follow-up (PANSS etc), established treatments, dopamine hypothesis of schizophrenia, novel approaches targeting the glutamate system and neuroprotection, genetics of schizophrenia, environmental risk factors, animal models (previous, present and future), behavioural battery focussing on testing higher brain functions in mice, magnetic resonance imaging (MRI), histology, and drug-challenge tests in experimental animals, long-term potentiation and short-term potentiation in the hippocampus, short-term plasticity, multi-electrode array (MEA) recordings, autaptic neuron preparation, multivariate covariance analysis as statistical means for evaluation of proof-of-concept trials.

Block 2: Multiple Sclerosis

Introduction to the disease, historical aspects, epidemiology, patient presentation (including videos), diagnostic criteria for disease classification including subtypes, imaging, neurophysiology, CSF diagnostics, neuropsychology, differential diagnoses and frequent comorbidities including psychopathology, pathophysiology including mediators of inflammation, mechanisms of axonal loss, demyelination, immunology including auto-immunity, basics of the functioning of the blood-brain-barrier and the brain immune system, genetics, environmental risk factors, animal models of multiple sclerosis and animal neuroimaging, mouse test battery for measuring motor function, fine motor performance and ataxia, therapeutic targets, established and experimental therapeutic approaches including symptomatic/supportive measures, the drug development process (clinical trials) and its challenges in multiple sclerosis.

Block 3: Amyotrophic Lateral Sclerosis

Introduction to the disease, historical aspects, epidemiology, patient presentation (including videos), diagnostic criteria, imaging, neurophysiology, psychopathology, neuropsychology (features of frontotemporal dementia in ALS and comparison with other types of dementia as differential diagnostic approach), pathophysiology, in particular oxidative stress, use of antioxidants, normal and disturbed axonal transport etc, genetics, environmental risk factors (neurotrauma etc), animal models of ALS, behavioural approach using motor function tests from Rota Rod to grip strength measurements, basis of novel therapeutic approaches, including viral therapy and siRNA, symptomatic / supportive treatments, end of life considerations, quality of life and related measures, palliative care in ALS, introduction into mixed model statistics and survival analysis.

Notes: The lecture series comprises also *practical parts* (short lab visits), e.g. psychopathology rating, neuropsychology testing, imaging, diagnostics, cell culture work, behavioural studies etc.

Guests: Prof. Uwe-Karsten Hanisch (University Medicine, Neuropathology; Dr. Susann Boretius (MPI-bpc, BioMed NMR)

Contact: Prof. Dr. Dr. Hannelore Ehrenreich, Tel. 0551 3899 615, e-mail: ehrenreich@em.mpg.de

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Gregor Eichele, Helena Miletic

A 13 - Mouse histology & in situ expression analyses

Date: tbd

Place: Department of Genes & Behavior, MPI for biophysical Chemistry, Am Fassberg 11, Tower 5, 2nd floor

No. of participants: min. 2, max. 4

Duration: 2-3 days

Time on Day 1:

Preparatory meeting: none

Short description: The histological analysis of gene and protein expression in tissue sections has become a widely used tool for studying biological processes *in vivo*. In the course we will stage mouse embryos, prepare histological sections of embryo and adult brain tissues from mice and analyse histology using standard staining procedures. If students are interested, the second part of the course will focus on expression analyses on sections using immunohistochemistry and *in situ* hybridisation approaches.

Applied techniques will be: embryo preparation and staging, tissue sectioning, histological staining, chromogenic *in situ* hybridisation and immunohistochemistry.

Contact: Helena Miletic, Tel. 0551-201 2700, helena.miletic@mpibpc.mpg.de

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Dirk Fasshauer, Pawel Burkhardt, F. Esra Demircioglu

A 14 - Protein-protein interactions in membrane traffic

Date: tbd (between mid-Feb and end of 2009)

Place: Department of Neurobiology, MPI-bpc, T6, 1st Floor

No. of participants: up to max. 4 people

Duration: 2 -3 days

Time on Day 1: 09:30

Preparatory meeting: none

Short description: Assembly of syntaxin 1a, SNAP-25, and synaptobrevin 2 into a tight SNARE complex between synaptic vesicle and plasma membrane is thought to be the driving force for neurotransmitter release. Munc18/nSec1 is known to tightly bind syntaxin 1a in a 'closed' conformation, a process that inhibits neuronal SNARE assembly *in vitro*. However, a gene deletion of Munc18 blocks neurosecretion. The project aims at investigating this discrepancy by studying the underlying protein-protein interactions in detail using biochemical and biophysical methods (isothermal titration calorimetry, fluorescence spectroscopy and CD-spectroscopy). In addition, to shed light on the conservation of this interaction, homologous proteins of syntaxin 1a and Munc18 are also being investigated.

Contact: Pawel Burkhardt, Tel. 0551 - 201 1935, pburkha@gwdg.de / F. Esra Demircioglu, Tel. 0551 - 201 1935, edemirc@gwdg.de

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Dirk Fasshauer, Nickias Kienle

A 15 - Introduction to bioinformatic tools

Date: tbd (between mid-Feb and end of 2009)

Place: Department of Neurobiology, MPI-bpc, T6, 1st Floor

No. of participants: up to max. 4 people

Duration: 2 -3 days

Time on Day 1: 09:30

Preparatory meeting: This would be advisable so that the background and the specific interests of the participants can be determined and taken into consideration.

Short description: In modern biology, bioinformatic methods are essential. Such methods can be the search for DNA/protein sequences in online databases, the comparison between sequences or the construction of an alignment. The aim of this course is to give an introduction into basic bioinformatic tools (e.g. NCBI, Expasy, blast, muscle, t-coffee, Jalview) to address these problems.

Contact: Nickias Kienle, Tel. 0551 201-1621 (nkienle@gwdg.de).

Ivo Feußner, Cornelia Goebel

A 16 - Introduction to lipid analysis.

Date: tbd

Place: Dept. of Plant Biochemistry Labs 2.319-2.322, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: min. 3, max. 6

Duration: 3 d

Time on Day 1: 9:00 a.m.

Preparatory meeting: not necessary, but an introductory seminar at the first day at 9 a.m.

Short description: Beside nucleic acids, proteins and sugars, lipids form the fourth group of biomolecules. In general they can be divided into sterols, glycero- and sphingolipids. This practical course will cover basic methods of lipid analysis and is intended to students that do not regularly work with this class of molecules. Thus we will analyze lipid profiles of tissue extracts derived from different plant organs of different developmental stages.

Specifically the following experiments are planned:

- Extraction and fractionation procedures
- Separation of lipids by thin layer chromatography
- Analysis of fatty acids by gas chromatography
- Further characterization of fatty acid isomers by gas chromatography / mass spectrometry
- Structural analysis of lipids by liquid chromatography / mass spectrometry

Contact: Dr. Cornelia Göbel, Tel. 0551 39 14438, cgoebel@uni-goettingen.de

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Julia Fischer, Kurt Hammerschmidt, Christina Keller

A 17 - Introduction to bioacoustic field methods: from recordings to statistics

Date: 20-22 May 2009

Location: German Primate Center, Seminar room B2.12

No. of participants: min. 2, max. 5

Preparatory meeting: none

Time on Day 1: 9:00

Short description: This short methods course will provide a brief introduction into the basic steps of bioacoustic research. We will begin with some elementary physics of sound and a theoretical introduction to sound production as well as acoustic analyses. We will then do a mini-project which includes acoustic recordings in the field, selection of sounds for further analyses, and an overview over standard measures used in the analyses of animal and human sounds. Some of the most important multivariate statistical tools

that are commonly applied will also be presented. The course will last 2.5 days and will be held at the German Primate Center.

Contact: Kurt Hammerschmidt, Tel. 0551 3851 283, hammerschmidt@cog-ethol.de

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Alexander Gail, Stefan Treue

A 18 - Non-invasive probing of brain function – Introduction to psychophysics

Date: 9-11 February 2009 (1st day: afternoon only)

Note: This course was already announce in 2008 and participants have been assigned for the course in February. The course will be offered once again, pending on the interest in it.

Number of participants: min 3, max 6

Place: German Primate Center

Duration: 2.5 days

Time on Day 1:

Preparatory meeting: none

Short description: This course introduces the basic methodological concepts for quantifying perception and behavior with psychophysical methods in humans and non-human primates. The course includes a short introductory lecture on the theoretical backgrounds (first day). In small groups each participant will have the opportunity to conduct and perform different exemplary psychophysical experiments on visual perception and sensorimotor integration in practice. We will introduce the concepts of perceptual thresholds, sensory and sensorimotor adaptation, reaction-time measurements, non-invasive behavioral eye- and hand-movement registrations, and advanced methods for behavioral data analysis. Based on the collected data the strength, limitations, and potential pitfalls of psychophysical measurements will be discussed.

Contact: Prof. Dr. S. Treue (treue@gwdg.de), Dr. A. Gail (agail@gwdg.de), *Secretary*: Beatrix Glaser (bglaser@gwdg.de)

Christiane Gatz, Benjamin Fode

A 19 - Chromatin Immunoprecipitation (ChIP)

Date: tbd

Place: General and Developmental Physiology of the Plant, Untere Karspüle 2

Number of participants: min. 2, max. 4

Duration: 2 days

Time on day 1: 9:30 a.m.

Preparatory meeting: none

Short description: ChIP is an easy tool to investigate the transcriptional regulation by Protein-DNA interaction. You can monitor the direct binding of Proteins to specific regions of the DNA or identify new targets for your proteins of interest in microarray analyses (ChIP for chip).

In this course we will show you the basic techniques for simple ChIP experiments. For the reason of the relative time consuming whole procedure you will be provided with prepared chromatin (from plants) to perform the ChIP with an antibody against a plant-specific protein. The first day of the course will start with an introduction and overview about ChIP, so that a preparatory meeting is not necessary. The ChIP itself will take two days including the monitoring via realtime-PCR.

Contact: Benjamin Fode, Tel. 0551 - 39 2665, bfode@gwdg.de

Theo Geisel, Jan Nagler, Annette Witt, Tatjana Tchumatchenko

A 20 - How does Nature generate Time Series? Time Series Analysis and Modeling for Dummies

Date: 15 April – 15 July 2009, Wednesdays, 10:15 a.m. (2 SWS)

Place: Max Planck Institute for Dynamics and Self-Organization, Seminar Room, House 2, 4th floor

Time on day 1: 10:15 a.m.

Preparatory meeting: none

Short description: This course aims at graduate and undergraduate students of theoretical neuroscience and theoretical or experimental physics and will teach the fundamentals of time series analysis and time series modeling.

Homework assignments will not be given.

Contact: Jan Nagler., Tel: 0551-5176-418 (jan@nld.ds.mpg.de), Annette Witt (annette.witt@nld.ds.mpg.de)

Theo Geisel, Marc Timme, Fred Wolf

A 21 - Theoretical and Computational Neuroscience: Collective Dynamics Biological Neural Networks I

Date: winter semester I Fr. 14:00 – 16:00 h

Place: MPI for Dynamics and Self Organization, Seminarraum

No. of participants: -

Duration: weekly, 2 SWS

Preparatory Meeting: none

Short description: This lecture course offers an introduction to advanced modeling strategies for biological neural networks. After a short introduction to the biophysics of single cells and an overview of their basic firing patterns, we explain fundamental properties of networks models of neurons, starting from simple uniform connectivity and progressing to spatially extended and to arbitrarily complex interaction networks. These network models explain and predict key dynamical aspects of neural circuits, including irregular activity of cortical dynamics, feature selectivity, self-organization of neural maps, and the coordination of precisely timed spikes across networks.

We recommend to start in winter term, but a start in a summer term is possible as well.

Contact: Marc Timme, Tel. 0551 – 5176 440, timme@nld.ds.mpg.de

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Theo Geisel, Marc Timme, Fred Wolf

A 22 - Theoretical and Computational Neuroscience: Collective Dynamics Biological Neural Networks II

Date: summer semester II: 17.04.-17.07.09, Fr. 14.00-16.00 h

Place: MPI for Dynamics and Self Organization, Seminarraum

No. of participants: -

Duration: weekly, 2 SWS

Preparatory meeting: none

Short description: This lecture course offers an introduction to advanced modeling strategies for biological neural networks. After a short introduction to the biophysics of single cells and an overview of their basic firing patterns, we explain fundamental properties of networks models of neurons, starting from simple uniform connectivity and progressing to spatially extended and to arbitrarily complex interaction networks. These

network models explain and predict key dynamical aspects of neural circuits, including irregular activity of cortical dynamics, feature selectivity, self-organization of neural maps, and the coordination of precisely timed spikes across networks.

We recommend to start in winter term, but a start in a summer term is possible as well.

Contact: Dr. Marc Timme, Tel. 0551 – 5176 440, timme@nld.ds.mpg.de

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Dirk Görlich, Matthias Samwer

A 55 - Purification and identification of fungal toxins

Date: tbd

Place: Department of Cellular Logistics, MPI-bpc, T3, 3rd floor

Number of participants: max 3

Duration: 2 days

Preparatory meeting: tba

Short description: Toxins from various organisms have massively influenced modern medicine and biology. Antibiotics are great examples for molecular warfare among microorganisms and have saved millions of lives in the past decades. Other toxins are important tools for biological investigations, e.g. α-amanitin that lead to the discovery of the three RNA polymerases or phalloidin that is used to investigate the cytoskeleton.

This course aims at extracting toxins from the green death cap and purifying them on an HPLC system. The different fungal toxins will be identified by mass spectrometry. Finally, a functional test for their effect on the actin cytoskeleton will be performed.

Contact: Matthias Samwer, Tel. 0551 2433, matthias.samwer@mpibpc.mpg.de

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Jörg Großhans, Takuma Kanesaki

A 23 - Multi-colour time-lapse imaging of cells and embryos

Date: tbd (September 09)

Place: Dept. Developmental Biochemistry, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: min. 2, max. 4

Duration: 2 days

Time on day 1: 10:00 a.m.

Preparatory meeting: none

Short description: The behavior of cells and the development of embryos from *Drosophila* that express fusion proteins with GFP, RFP or variants will be followed by time-lapse recordings with a fluorescent microscope with spinning disc optics. Structures and processes to be analysed include mitosis, nuclear envelope, microtubules, recycling endosome. On the second day students may bring and record their own samples.

Contact: Prof. Jörg Großhans, Tel. 0551-39-8242, joerg.grosshans@medizin.uni-goettingen.de

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Helmut Grubmüller, Stefan Lakämper

A 24 - Introduction to molecular dynamic simulation

Date: 1-2 days within 30.03.-09.04.09

Place: tba

No. of participants: -

Duration: 1 to 2 days

Preparatory meeting: none

Short description: Molecular Dynamics (MD) simulations are a method to calculate the atomistic dynamic of biomolecules. The movements of all atoms are calculated based on their respective interactions to all other atoms.

The goal of this practical course is to learn the basic handling of this method. Starting with the examination of thermodynamic properties of a simple gas system, the concepts of MD simulations are shown. Later on, the build-up and simulation of a complete protein system is performed.

In that part, also various analytical methods for MD simulations are considered.

Contact: Prof. Helmut Grubmüller, Tel. 0551 – 39 2301, hgrubmu@gwdg.de

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Helmut Grubmüller, Christoph Schmidt

A 25 - Current Topics in Biophysics – Lecture Series

Date: summer semester and winter semester, Fridays 9.15 a.m. – 10.45 a.m.

Place: seminar room – department of Prof. Schmidt section F 2nd floor, room F02.125, Neue Physik, Friedrich-Hund-Platz 1

No. of participants: min. 3

Duration: weekly during 2 semesters

Preparatory meeting: none

Short description: Rotation course that offers a broad overview of the methods actively used in the program "Physics of Biological and Complex Systems (from experimental to theoretical, from spectroscopy to whole-cell manipulations, from microscopy and nanoscopy to the simulation of complex systems). This "methods in a nutshell" course provides a unique opportunity to get acquainted with several techniques, both theoretical and experimental, as taught by the experts.

Contact: Antje Erdmann, Tel. 0551 – 201 2322, IMPRS-pbcs@gwdg.de

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Helmut Grubmüller, Udo Schmitt, Bert de Groot

A 26 - Computational Biophysics I

Date: winter semster I: Mondays 16.00-18.00 h

Place: Physics Faculty HS4, A0.106; Physics Faculty – CIP Pool1, CO.110

No. of participants: min. 3

Duration: weekly, 2 SWS

Preparatory meeting: none

Short description: Combined lecture and hands-on computer tutorial. Theory and computer simulations of biomolecular systems, particularly proteins. Proteins enable virtually all tasks in our bodies, on the molecular level. Goal is an understanding of these 'nano-machines' on an atomistic scale. Basic knowledge in Physics essential.

"Computational biophysics I"

Contents: protein structure, intra and intermolecular interactions, protein dynamics, molecular dynamics simulations, principal component analysis, normal mode analysis, functional dynamics of proteins, quantum mechanical approaches (Hartree-Fock, density functional theory), hands-on computer simulation.

Contact: Dr. Bert de Groot, Tel. 0551 – 201 2308, bgroot@gwdg.de

Helmut Grubmüller, Udo Schmitt, Bert de Groot

A 27 - Computational Biophysics II

Date: summer semester II: 20.04.-13.07.09, Mondays 16 – 18 h

Place: Physics Faculty HS4, A0.106; Physics Faculty – CIP Pool1, CO.110

No. of participants: min. 3

Duration: weekly, 2 SWS

Preparatory meeting: none

Short description: Combined lecture and hands-on computer tutorial. Theory and computer simulations of biomolecular systems, particularly proteins. Proteins enable virtually all tasks in our bodies, on the molecular level. Goal is an understanding of these 'nano-machines' on an atomistic scale. Basic knowledge in Physics essential.

"Computational biophysics II"

Advanced topics in computational biophysics.

Contents: Enzymatic catalysis, chemical reactions in proteins, free energy calculations, thermodynamics, Poisson-Boltzmann calculations, Transition State Theory, Jarzynski-equation, sequence and structure bioinformatics, protein structure prediction, hands-on computer simulation.

Contact: Dr. Bert de Groot, Tel. 0551 – 201 2308, bgroot@gwdg.de

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Heidi Hahn, Frauke Nitzki

A 28 - In situ hybridisation of paraffin embedded tissue sections

Date: tbd

Place: Abteilung Humangenetik, Heinrich-Düker-Weg 12

No. of participants: min. 2, max. 4

Duration: 3 days (plus an additional 1-2 days to complete the final reaction)

Time on Day 1: tbd

Preparatory meeting: none

Short description: Students will learn how to perform the mRNA expression analysis on sections of paraffin-embedded tissues. The hybridisation itself will take 3 days (the final reaction will be completed after additional 1 – 2 days).

Contact: Dr. Frauke Nitzki, Tel. 0551 3914013, fnitzki@gwdg.de.

Uwe-Karsten Hanisch

A 29 - Activity-controlled purification of a protein by HPLC techniques

Date: tbd

Place: Institute of Neuropathology, University Hospital, Robert-Koch-Str. 40

Number of participants: min. 2, max. 4

Duration: 2 days

Time on day 1: 9:00 a.m.

Preparatory meeting: yes (one week before the course, date yet to be confirmed)

Short description: The isolation or further purification of proteins from tissue extracts, cellular preparations or biological fluids represents a major and frequent task in all fields of biosciences. The proteins purified at analytical or (semi)preparative scale can then undergo further biochemical and functional characterization, will be used as antigens for the generation of antibodies or serve as to their biochemical and biological activities various applications in research, diagnostics and even therapeutic treatments. The isolation process itself requires the first extraction from the starting material which is followed by suitable steps of purification. Besides — or rather than — the yield (amount of isolated protein), the isolation procedures in research settings mainly aim at a sufficiently high purity (removal of unrelated proteins and separation from other molecules) while preserving the native structure and maintaining the biochemical and biological activities. Several chromatographic techniques allow for the separation of proteins under relatively mild conditions and as based on their different physicochemical or biological properties (e.g. charge, size, interaction with other molecules). The various isolation steps are thereby mostly depending on suitable assays to both follow the separation/enrichment of the target protein among multiple fractions and to determine the successful preservation of its structural and/or functional integrity.

During the course, the students will purify a serine protease from a crude preparation using HPLC/FPLC-assisted gel filtration and affinity chromatography. The purification steps are monitored by both a respective enzymatic assay (based on cleavage of a specific substrate and its quantification in a colorimetric test) as well as an immunoblot analysis (based on a specific antibody staining) to follow the protein and the protease activity. The yield (total and relative amount of isolated material) as well as the successful purification (expressed as specific activity) are determined. The course can be assisted by a refreshment seminar on protein purification and enzymology.

Contact: Prof. Uwe-Karsten Hanisch, Tel. 0551 - 39 6520, ukhanisch@med.uni-goettingen.de

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Uwe-Karsten Hanisch

A 30 - Preparation and characterization of primary (micro)glial cultures

Stimulation and characterization of their inflammatory response

Date: tbd

Place: Institute of Neuropathology, University Hospital, Robert-Koch-Str. 40

Number of participants: min 2, max 4

Duration: 2 days

Time on day 1: 9:00

Preparatory meeting: yes (one week before the course, date yet to be confirmed)

Short description: Microglia represents the CNS equivalent of a tissue macrophage. The normally 'resting' cells constantly monitor their environment for signs of disturbed tissue homeostasis. A variety of molecular signals which indicate an exogenous or endogenous threat to the structural and functional integrity of the CNS can trigger a rapid transformation to alerted and finally fully reactive states. Activated microglia can then exert a variety of macrophage-characteristic, yet CNS-adapted functions in support of endangered neurons, to fight off an infection, to recruit the assistance of the adaptive immune system or to organize for attempts of repair. The primary and apparently phylogenetically approved function of these cells is protection and restoration. However, excessively or chronically activated — or dysregulated — microglia can also contribute to cellular impairment and tissue destruction as observed in various neuropathological scenarios. Among the molecular signals which can challenge microglial responses, structures of bacterial, viral or fungal origin have been identified to serve as ligands for diverse Toll-like receptors (TLR), a family of pattern recognition receptors as expressed by cells of the innate and adaptive immune systems. Stimulation of these TLR's thereby triggers complex intracellular signalling pathways which cascade in the induction of various immunoregulatory cytokines and chemoattractive chemokines. Primary cultures of microglial cells have been serving as a model to study mechanisms of activation and to determine functional features. The course gives a practical introduction into the culture preparation as well as characterization and demonstrates the cellular response behaviour upon confrontation with TLR agonists.

The course demonstrates the preparation of a primary microglial culture, from the tissue processing to the isolation and plating of the homogenous microglial cells. The purity of the culture will be determined by cell-specific staining procedures. Prepared cultures will then be stimulated by Toll-like receptor agonists for the induction of an inflammatory response, e.g. characterized by the synthesis and secretion of proinflammatory cytokines and chemokines. The induction will be determined at the mRNA level using real-time PCR. The actual release of the respective proteins will be quantified by ELISA.

The students will follow the tissue processing and culture preparation (day 1). They will perform the immuno/lectincytochemical staining and microscopic analysis (day 1/2), also to determine the quality of cell preparation. The course participants will stimulate glial cultures to induce a cellular response to a challenge by TLR ligands (day 1). They will characterize the response as to the induction of proinflammatory factors, using both quantitative mRNA as well as protein analyses. These steps involve the isolation and processing of mRNA (day 2) and the performance of PCR and ELISA (day 3).

Contact: Prof. Uwe-Karsten Hanisch, Tel. 0551 - 39 6520, ukhanisch@med.uni-goettingen.de

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Ralf Heinrich

A 31 - The neuronal basis of acoustic communication in insects. Part II: Control of sound production

Date: 1.9. - 5.9.2009 (every two years during summer (July or August); alternating with the course "The neuronal basis of acoustic communication in insects. Part I: The auditory system", held by Prof. Dr. Andreas Stumpner)

Place: University of Göttingen, Dept. Neurobiology, Institute for Zoology

Number of participants: min. 2, max. 6

Duration: 5 days

Time on day 1: 9:00 a.m.

Preparatory meeting: none

Summary: The acoustic communication of grasshoppers is a suitable preparation to investigate central nervous mechanisms underlying decision making and adaptation of behavioral patterns with regard to the encountered situation. Usually the males, but under certain conditions also the females, generate species-specific sound patterns for attraction, courtship or defense of resources. The neuromuscular patterns for the stridulatory singing movements of the hind legs are produced by metathoracic circuits that can be activated by command neurons originating from the protocerebrum. The central body complex apparently integrates sensory information related to acoustic communication, selects an appropriate song pattern (type of acoustic signal; time, duration and intensity of its performance) and activates the command neurons in a particular temporal pattern.

Injections into the central body neuropil of putative transmitters, their agonists and antagonists, and of membrane permeable drugs that interfere with intracellular signaling pathways, suggested that various transmitters (such as ACh, proctoline, dopamine, ATP, GABA, nitric oxide) contribute to the selection and control of song patterns through the activation of ionotropic and metabotropic receptors. Activation of second messenger pathways leading to the accumulation of cAMP, IP_3/DAG (which promote stridulation), and cGMP (which inhibits stridulation) have been demonstrated to modulate the behavioral threshold for sound production.

Covered Topics and Methods: Behavior: acoustic communication of grasshoppers; pharmacological stimulation of sound production by microinjection into the brain; probing the balance of excitation and inhibition in the control of sound production; pharmacological modulation of behavioral threshold; registration and evaluation of singing movements and acoustic signals; dissection, fixation and sectioning of grasshopper brains; histological and immunocytochemical evaluation of signaling pathways that contribute to the cephalic control of sound production; epifluorescence and confocal microscopy

Literature for further information:

- Bicker und Menzel (1989) Chemical codes for the control of behaviour in arthropods. Nature 337: 33-39.

- Hedwig und Heinrich (1997) Identified descending brain neurons control different stridulatory motor patterns in an acridid grasshopper. J. Comp. Physiol. 180: 285-294.
- Heinrich R. Impact of descending brain neurons on the control of stridulation, walking and flight in orthoptera. Microscopy Research and Technique, 56: 292-301, 2002.
- Heinrich, Wenzel und Elsner (2001) A role for muscarinic excitation: Control of specific singing behavior by activation of the adenylate cyclase pathway in the brain of grasshoppers. Proc Nat Acad Sci USA 98: 9919-9923.
- Homberg (2002) Neurotransmitters and neuropeptides in the brain of the locust. Microscopy Res and Tech 56: 189-209.
- Osborne (1996) Insect neurotransmission: Neurotransmitters and their receptors. Pharmacol. Ther. 69: 117-142.
- Wenzel B., Kunst M, Günther C., Ganter G.K., Lakes-Harlan R., Elsner N., Heinrich R. Nitric oxide/cyclic GMP-signaling in the central complex of the grasshopper brain inhibits singing behavior. J Comp Neurol, 488: 129-139, 2005.

Contact: Prof. Ralf Heinrich, Tel. 0551 – 39 91183, rheinri1@gwdg.de

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Claudia Höbartner

A 32 - Chemical synthesis and enzymatic ligation of RNA and DNA oligonucleotides

Date: tbd (June and/or December 2009)

Place: MPI-bpc, AG Nucleic Acid Chemistry, T2, SOG

No. of participants: max 3

Duration: 2 days

Preparatory meeting: none (short seminar on day 1)

Short description: The course covers methods for the automated solid-phase synthesis of chemically modified oligonucleotides by phosphoramidite chemistry, purification of synthetic RNA and DNA by anion exchange and reversed-phase HPLC and by preparative denaturing PAGE, and strategies for the enzymatic ligation of RNA fragments by protein enzymes and deoxyribozymes.

Contact: Dr. Claudia Höbartner, 0551 201 1685, claudia.hoebartner@mpibpc.mpg.de

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Reinhard Jahn, Geert van den Bogaart, Matthew Holt

A 33 - Biophysical Analysis of SNARE-mediated membrane fusion

Date: tbd

Place: Department of Neurobiology, MPI-bpc, T6, 1st Floor

No. of participants: min. 2, max. 6

Duration: 2 days

Time on Day 1: 9:30 a.m.

Preparatory meeting: none

Short description: SNARE proteins are essential for membrane fusion in eukaryotic cells, in processes as diverse as ER to Golgi trafficking and neurotransmitter release. We are interested in understanding the mechanisms underlying secretion from neurons. We attempt to do this using a minimalistic assay, in which SNARE proteins are incorporated into artificial lipid vesicles. The SNARE protein interactions and mixing of the lipid bilayers, which occur upon fusion, are monitored using fluorescence methods.

Contact: Dr. Mathew Holt, Tel. 0551 - 201 1670, mholt@gwdg.de

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Reinhard Jahn, Hans Dieter Schmitt

A 34 - Molecular Biology of yeast: Applications of the "Tandem Affinity Purification" tag in yeast with wild type and mutant background

Date: tbd

Place: MPI-bpc, Dept. Neurobiology, Schmitt Group, T6, 1st Floor

No. of participants: min. 2, max. 2

Duration: 3 days

Time on Day 1: 09:00

Preparatory meeting: yes, 1 week before, exact date to be confirmed

Short description: The bakers' yeast *Saccharomyces cerevisiae* was the first eukaryote whose whole genome was sequenced. In this yeast homologous recombination works with very high fidelity, making genetic manipulations very easy. This allowed genome wide analysis of gene function by fusing all putative genes with tags that can be used for many different purposes. We use collections of strains carrying individually tagged genes and various mutations for the analysis of protein complexes.

The following techniques will be applied during the course.

- PCR and transformation of yeast to add N-terminal 'TAP-tag' to genes whose products cannot tolerate the standard C-terminal modifications.
- Classical genetic techniques (crosses and tetrad analysis) to introduce mutations into strains expressing a tagged protein.
- Using simple pull-down experiments (one step) the effect of mutations on interactions within subunits in a protein complex will be analyzed.
- Tandem affinity purification (two step procedure) will be employed to identify new subunits of a large protein complex by mass spectroscopy.

Recommended reading:

Kraynack BA, Chan A, Rosenthal E, Essid M, Umansky B, Waters MG, Schmitt HD (2005) Ds11p, Tip20p, and the novel Ds13(Sec39) protein are required for the stability of the Q/t-SNARE complex at the endoplasmic reticulum in yeast. Mol Biol Cell 16: 3963-3977.

Ghaemmaghami, S., Huh, W.K., Bower, K., Howson, R.W., Belle, A., Dephoure, N., O'Shea, E.K., and Weissman, J.S. (2003). Global analysis of protein expression in yeast. Nature *425*, 737-741.
Puig, O., Caspary, F., Rigaut, G., Rutz, B., Bouveret, E., Bragado-Nilsson, E., Wilm, M., and Seraphin, B. (2001). The tandem affinity purification (TAP) method: a general procedure of protein complex purification. Methods *24*, 218-229.

Contact: Dr. Hans Dieter Schmitt, Tel. 0551 - 201 1652, hschmit@gwdg.de

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Reinhard Jahn, John Chua, Janina Boyken

A 35 - Co-immunoprecipitation as a technique to study protein-protein interactions

Date: tbd

Place: MPI-bpc, Dept. Neurobiology, T6, 1st Floor

No. of participants: min. 2, max. 6

Duration: 3 days

Time on Day 1: 9:00 a.m.

Preparatory meeting: Yes

Background: Physical interactions between biological molecules are pivotal to the workings of many biological processes. Identification of molecules binding to an individual protein not only sheds light on its function but also provides valuable information on the cellular process or pathways with which it is associated.

While many approaches are available to identify or verify protein-protein interactions, co-immunoprecipitation remains a valuable *in vitro* method for this purpose. Nevertheless, the technique should be carefully implemented in order that the results may be reliably interpreted.

Day 1: Cell lysis and co-immunoprecipitation

Day 2: Washing of co-immunoprecipiates, SDS-PAGE and Western blot

Day 3: Development of Western blot

Contact: Dr. John Chua, Tel. 0551 201-1663, jchua@gwdg.de

Reinhard Jahn, Karin Kühnel, Amanda Schalk

A 36 - Basic techniques in protein purification and characterization

Date: tbd

Place: MPI-bpc, Dept. Neurobiology, Kühnel Group, T6, 1st Floor

No. of participants: min. 2, max. 6

Duration: 3 days

Time on Day 1: 9:00 a.m.

Preparatory meeting: none

Short description: In this course we want to cover the important aspects concerning the expression, purification and characterization of proteins. We will purify proteins from E.coli extracts using high affinity, ion-exchange and size exclusion chromatography with an Äkta-FPLC system. The purity of proteins will be analyzed by SDS-PAGE. We will also cover basic techniques in handling proteins, for example try different methods for determining protein concentrations, the dialysis of proteins and how to concentrate proteins through ultrafiltration.

Contact: Karin Kühnel, Tel. 551 201-1795, kkuehne@gwdg.de

Stefan Jakobs, Tim Grotjohann, Tanja Brakemann

A 37 - PCR based mutagenesis strategies to evolve (photoswitchable) fluorescent proteins

Date: between 20th and 24th April 2009

Place: Department of NanoBiophotonics, MPIbpc, T2, 2nd floor

No. of participants: min. 2, max. 4

Duration: 2 days

Time on Day 1: 9:00

Preparatory meeting: none, short seminar on day 1

Short description: GFP-like fluorescent proteins are powerful tools to study protein dynamics in living cells. The actual properties of the fluorescent proteins may be dramatically altered by slight changes in their amino acid sequences. This practical course will cover several basic methods for targeted and random mutagenesis based on PCR. We will use the coding sequences of switchable fluorescent proteins as templates. The mutagenized proteins will be screened for variants exhibiting different properties.

Contact: Dr. Stefan Jakobs, Tel 0551-2012531 (sjakobs@gwdg.de)

Steven Johnsen

A 38 - Use of chromatin immunoprecipitation for the analysis of transcription factor binding in vivo *in cultured mammalian cells*

Date: tbd (October or November) and second meeting 2 – 3 weeks later to discuss the results

Place: Dept. of Molecular Oncology, Johnsen lab, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: min. 3, max. 5

Duration: 2-3 days

Time on Day 1: 9:00 a.m.

Preparatory meeting: none

Short description: Chromatin immunoprecipitation (ChIP) is a technique that allows one to investigate the binding or recruitment of specific proteins to a given DNA sequence *in vivo*. In addition, the techique can be used to determine changes in transcription factor binding, covalent histone modifications, or other protein modifications directly on an endogenous gene follwoing a specific treatment. This course will provide the participants with hands-on experience in performing quantitative qChIP analyses on cultured mammalian cells. As a model system we will investigate the binding of p53, RNAPII and other transcriptional regulatory factors or histone modifications to the p21 gene following activation of p53 by chemotherapeutic agents. We will specifically look at the binding of these different proteins to specific sites on the gene (i.e., promoter, transcriptional start site and transcribed region). In addition to learning the methodology, particular emphasis will be given on the analyses and interpretation of the data. A basic understanding of real-time PCR technology is expected.

Contact: Dr. Steven Johnsen, Tel. 0551 39 10373, steven.johnsen@zentr.uni-goettingen.de

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Ralph Kehlenbach

A 39 - Analysis of nucleocytoplasmic transport by flow cytometry

Date: June or August

Place: Dept. of Biochemistry I, Humboldtallee 23, 37073 Göttingen

No. of participants: min. 2, max. 4

Duration: 2 or 3 days

Time on Day 1: tbd

Preparatory meeting: none

Short description: This short course will provide a brief introduction into the concepts of nucleocytoplasmic transport and its analysis by flow cytometry. We will express a transport factor in bacteria, purify it and test its activity in permeabilized cells. Nuclear import and export of fluorescent reporter proteins can be analyzed in parallel by flow cytometry. The principles of flow cytometry and its applications will be discussed.

Contact: Dr. Ralph Kehlenbach, Tel. 0551 39 5950; rkehlen@gwdg.de

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Stefan Luther, Ulrich Parlitz

A 40 - Nonlinear Dynamics and Time Series

Date: end of WS 09/10

Place: III. Physical Institute, Uni Göttingen

No. of participants: min. 4, max. 10

Duration: 2 weeks

Time on Day 1: 9-18 h

Preparatory meeting: January 2010

Short description: In lectures and hands-on computer experiments, the participants learn fundamental terms of nonlinear dynamics and relevant properties of nonlinear, deterministic chaotic systems.

Numerical simulations are used to explore nonlinear dynamics of selected nonlinear systems. The course covers (among others) the following topics: periodic orbits, bifurcations, nonlinear time series analysis, sensitive dependence on initial conditions, control and synchronization of chaotic systems, modeling and prediction.

http://www.dpi.physik.uni-goettingen.de/praktika/nldkurs.html

http://univz.uni-goettingen.de/qisserver/rds?state=verpublish&status=init&vmfile=no&publishid=34238&moduleCall=webInfo&publishConfFile=webInfo&publishSubDir=veranstaltung

Contact: Prof. Ulrich Parlitz (parlitz@physik3.gwdg.de), Dr. Stefan Luther (stefan.luther@ds.mpg.de)

Tobias Moser, Andrea Antal, Nicola Strenzke, Gerhard Hoch

A 41 - Auditory and visual evoked potentials

Duration: 2 days

Dates: tbd (fall 2009)

Start on Day 1: 9:00 a.m.

No. of participants: tba

Preparatory meeting: none

Summary: Potentials arising from neuronal population responses to sensory stimuli such as light flashes and tone bursts offer a affordable and quantitative test of peripheral and central sensory processing. Analysis of sensory function has become an essential part of mouse phenotyping. In this 2 days practical course we will cover the biological basis, technical implementation, practical realization and data analysis of auditory and visual evoked potentials in the mouse.

Covered Topics and Methods:

Auditory Physiology: otoacoustic emissions, auditory evoked potentials: click and tone burst auditory brainstem responses, auditory steady state responses.

Visual Physiology: Scotopic and photopic electroretinogram (ERG), visual evoked cortical potentials (VEP).

Contact: Prof. Tobias Moser, tmoser@gwdg.de; PD Dr. med. Andrea Antal, Tel. 0551 39 8192, AAntal@gwdg.de

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Tobias Moser, Martin Göpfert, Andre Fiala, Fred Wolf, Detlev Schild

A 42 - Fundamental Principles of Sensory Processing

Duration: 2 days

Dates: 20-21 May 2009

Start on Day 1: 9:00 a.m.

No. of participants: -

Preparatory meeting: none

Summary: Symposium and methods workshop with prominent speakers in sensory neuroscience, provisionally including AJ Hudspeth, P Jorris, J Benda, G Lewin, M Brecht, GG Matthews, J Diamond, T Gollisch, S Treue, D Schild, A Fiala, M Göpfert, T Moser, F Wolf.

Further details will follow in a separate announcement.

Contact: Prof. Tobias Moser, tmoser@gwdg.de.

Marcus Müller, Richard Vink

A 43 - Computer simulation methods in statistical physics

Date: tbd

Place: tbd

No. of participants: min., max.

Duration: -

Preparatory meeting: none

Short description: The use of computers to solve problems in statistical physics is well established, and extremely useful in cases where exact solutions are not available. In this course, the Monte Carlo simulation method will be presented, whose applications are widespread, and include the field of biology. Starting with the basic Metropolis algorithm for the Ising model, this course will gradually move on to consider more complex systems, and show how the Monte Carlo method can be used to extract thermodynamic limit properties with relative ease.

Literature:

- M. Newman and G. Barkema, Monte Carlo methods in statistical physics (Clarendon Press, Oxford, 1999).
- D. Frenkel and B. Smit, Understanding Molecular Simulation (Academic Press, 2002).

Contact: Dr. Richard Vink, Tel. 0551 - 39 7684, Richard.Vink@theorie.physik.uni-goettingen.de

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Klaus-Armin Nave, Wiebke Möbius

A 44 - Subcellular localization of proteins by immunoelectron microscopy of cryosections

Date: Course I: 11-12 May 2009, Course II: 2-3 November 2009 (if absolutely not suitable, also possible to make a flexible date)

Place: Max-Planck-Institute of Experimental Medicine

Number of participants: min. 2, max. 3

Duration: 2 days

Time on day one: 9:30 a.m.

Preparatory meeting: none

Short description: Immunoelectron microscopy (IEM) is an important method to study the intracellular distribution of a protein of interest at high resolution. By IEM, the precise localization of a protein can be studied directly in its cellular environment, which is identified by morphological criteria. Here, we use chemically fixed tissue for ultrathin cryosectioning that was cryoprotected with 2.3 M sucrose and frozen in liquid nitrogen. Sections are labelled with antibodies and protein-A coupled to colloidal gold and viewed in the electron microscope.

Day 1: Introduction and cryosectioning

Day 2: Immunolabeling and electron microscopy

Contact: Dr. Wiebke Möbius, Tel.: 0551-2509920, moebius@em.mpg.de

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Klaus-Armin Nave, Moritz Rossner

A 45 – Microdissection combined with RNA Analysis in the brain

Date: Flexible, but earliest from June 2009. We offer maximally two consecutive slots within one week.

Place: Max-Planck-Institute for experimental Medicine, Hermann-Rein-Str. 3

Number of participants: min. 2, max. 3

Duration: 3 days

Time on day 1: tbd

Preparatory meeting: None

Short description:

Day 1: Introduction, Cryosectioning and staining of mouse brain on glass and membrane slides, microdissection, collection of samples

Day2: RNA preparation, Quality control using the Agilent Bioanalyzed, cDNA synthesis

Day3: qRT-PCR with cell-type specific primers to assess the purity of the samples

Contact: Dr. Moritz Rossner, Tel. 0551 3899 781, rossner@em.mpg.de

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Olympus (Bodenschatz lab)

A 46 - Theory and basics of fluorescence microscopy and imaging / Introduction to life science research applications FRET, FRAP, FLIM, caging – uncaging, GFP, Fluorescence microscopy of living cells

Duration: 2 days

Dates: tbd (Group I, Group II)

Start on Day 1: 9:00 a.m.

No. of participants: min. 3, max. 6

Prep Meeting: none

Short description: This course will show how:

- to set up a microscope and camera for fluorescence observation with different illuminations settings and their correct alignment.
- to find the appropriate filter combination for a given fluorochrome and application.
- to describe the benefit of different possible filter combinations.
- to describe the benefit of different light sources.
- to create digital images of fluorescence specimen.
- to describe the special needs for microscope, camera and software according to main applications.

Furthermore the course gives an Introduction to life science research applications

Principles of confocal microscopy; TIRF confocal microscopy

FRET, FRAP, FLIM,, caging – uncaging, GFP

Fluorescence microscopy of living cells

Types of applications (e.g. Ion sensitive dyes, GFP)

Venue: Fluid Dynamics, Pattern Formation, and Nanobiocomplexity Research Group, headed by Prof. Bodenschatz, at the MPI for Dynamics and Self-Organisation, provisionally accommodated at the MPI-bpc.

Contact Olympus: Dr. Andreas Reichert, andreas.reichert@olympus.de

Contact Bodenschatz Group: Barbara Kasemann, barbara.kasemann@ds.mpg.de

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Henrik Oster

A 47 - Real-time luminescence recordings in organotypic slice cultures

Date: tbd

Place: Circadian Rhythms Group, Department of Genes & Behavior, MPI for biophysical Chemistry, Am Fassberg 11, Tower 5, 2nd floor

No. of participants: min. 2, max. 4

Duration: 2 days (with 1 week in between)

Preparatory meeting: none

Short description: The transcriptional events that organise 24hr ("circadian") rhythms of physiology and behaviour are controlled by a set of clock genes that are rhythmically expressed in many tissues of the mammalian body. In the course we will prepare slice cultures from livers and other organs of transgenic mice that express firefly luciferase under the control of the circadian *Per2* promoter. On the second day luminescence traces will be analysed for circadian rhythmicity and compared between different tissues.

Applied techniques will include: tissue isolation, preparation of slices and culturing, luminescence recordings

Contact: Dr. Henrik Oster, Tel. 0551-201 2738, henrik.oster@mpibpc.mpg.de

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Walter Paulus, Andrea Antal

A 48 - Transcranial magnetic- and direct current stimulation

Date: 17-19 Feb 2009 (course has already been announced on 8 Jan 2009)

Place: Universitätsklinikum Göttingen Robert-Koch Straße 40, Hörsaal 91/92

No. of participants: 50

Preparatory meeting: none

Short description: The course is aimed at introducing the theoretical background and practical applications of TMS and tDCS to young researchers from all fields of neuroscience. Every effort will be taken to cover the broad spectrum of the areas involved in non-invasive brain stimulation, and to highlight recent developments in this field. Several invited lectures will be presented by world renowned scientists, followed by practical exercises in order to emphasize the technical backgrounds.

The program is available at http://www.neurologie.uni-goettingen.de/pdf/NWG_program_2009.pdf. The course consists of a mixture of lectures (first day, and in the morning of day 2 and 3) and practical exercises (afternoon of day 2 and 3). As you can see in the program, most of the guest lectures will be in German this year (with the exception of the talk by Colin McCaig on Feb 17), whereas the staff of the practical exercises if fluent in English. Dr. Antal indicated, that the entire course will be in English next year

Contact: PD Dr. med. Andrea Antal, Tel. 0551 39 8192, AAntal@gwdg.de

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Tomas Pieler, Katja Koebernick

A 49 - Analysis of gene expression (whole mount in situ hybridization, RT-PCR)

Date: tbd

Place: Dept. of Developmental Biochemistry, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: min. 3, max. 5

Time on Day 1: 9:00 a.m.

Preparatory meeting: none

Short description: Whole mount *in situ* hybridization and RT-PCR are widely used to characterize the spatiotemporal activity of genes. In this course we will analyze the expression of a panel of tissue-specific marker genes in different stages of *Xenopus* oo- and embryogenesis by whole mount in situ hybridization. RT-PCR will be applied to analyze these marker genes in total RNA preparations from *Xenopus* adult tissues. In particular, we will compare the expression of different marker genes expressed in germ cell progenitors using an ubiquitously expressed gene as control.

Contact: Dr. Katja Koebernick, kkoeber@gwdg.de, 0551-39-14615

Tomas Pieler, Maike Claußen

A 50 - Analysis of RNA-protein interactions

Date: second half of April or first half of June

Place: Dept. of Developmental Biochemistry, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: 2

Duration: 2-3 days

Time on Day 1: tbd

Preparatory meeting: none

Short description: During the course, RNA-protein interactions will be analysed by mobility shift assays using recombinant proteins and fluorescently labelled RNAs as well co-immunoprecipitation analysis with in vitro translated proteins.

Contact: Dr. Maike Claußen, Tel. 0551 - 39 14608, mclauss1@gwdg.de; Prof. Tomas Pieler, Tel. 0551 - 39 5683, tpieler@gwdg.de

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Tomas Pieler, Kristine Henningfeld

A 51 – Gene regulation in Xenopus

Date: tbd

Place: Department of Developmental Biochemistry, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: min. 1, max. 4

Duration: 2 – 3 days

Time on Day 1: 9:00 a.m.

Preparatory meeting: none

Short description: There are several advantages why the amphibian, *Xenopus laevis,* continues to be widely used as a model system to study vertebrate embryonic development. This includes the relatively fast and external development allowing direct accessibility to the developing embryo and the ease of microinjection (mRNA, DNA, antisense oligos…) into early cleavage stage embryos. In this short method course the student

will learn how to perform microinjection experiments of mRNA into *Xenopus* embryos. This includes obtaining eggs, in vitro fertilization, in vitro transcription of capped sense RNA and finally microinjection and cultivation of the embryos. The injected embryos will be evaluated for phenotype and influence of gene expression using luciferase reporter assays. Our laboratory will supply the gene of interest or alternatively the student could prepare in advance their gene of interest in the appropriate expression vector (please discuss in advance).

Contact: Dr. Kristine Henningfeld, khennin1@gwdg.de, Tel. 0551 - 39-14615

Andrea Polle, Bernd Kopka

A 52 - Transport processes and imaging with radionucleotides

Date: tbd

Place: Institute for Forest Botany, Radioisotope Lab, Büsgenweg 2 (http://www.radioisotope.de/)

No. of participants: max. 10

Duration: 5 days (short course of 2-3 days also possible)

Preparatory meeting: none

Short description:

Part I: Basics of radioactivity and measurement techniques.

Part II: Applications to DNA hybridization, dot blots with radioactively marked substances, DNA PK activity.

Contact: Bernd Kopka, Tel. 0551 - 39 8115 (bkopka@gwdg.de)

Peter Rehling

A 53 - Blue-native PAGE analysis of membrane protein complexes

Date: tbd

Place: Department of Biochemistry II, Heinrich-Düker Weg 12

No. of participants: min. 2, max. 3

Duration: approx. 3 days

Preparatory meeting: none

Short description: By using a specialized native gel system, referred to as Blue-Native PAGE, membrane protein complexes of up to 1.5 MDa can be separated. Here we will focus on the analysis of mitochondrial membrane protein complexes such as the respiratory chain complexes. Upon solubilization the complexes can be separated and their higher oligomeric states, so called supercomplecxes, can be visualized.

Contact: Prof. Peter Rehling, Tel. 0551 – 39 5947, peter.rehling@medizin.uni-goettingen.de

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Holger Reichardt, Jens van den Brandt

A 54 - Analysis of T cell development by FTOC (foetal thymic organ culture) and FACS (fluorescence-activated cell sorting)

Date: tbd

Place: Dept. Cellular and Molecular Immunology, Humboldtallee 34

Number of participants: min. 1, max. 3

Duration: 3 individual days within a 10 days period

Time on day 1: 9:00 a.m.

Preparatory meeting: required

Short description: Analysis of lymphocyte development and its underlying mechanisms is one of the most absorbing fields in immunology. In this short course the participants will gain insight into two basic immunological techniques that allow studying thymocyte differentiation ex vivo. Besides isolation of the foetal thymus and its cultivation as an intact organ, the participants get acquainted with the analysis of lymphocytes by flowcytometry. This includes a detailed introduction into the methodological background of FACS as well as hands-on experience in the simultanous analysis of up to six different surface proteins using a FACSCantoII device.

Contact: Dr. Jens van den Brandt, Tel. 0551 - 39 22027 , jbrandt@med.uni-goettingen.de

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Halyna R. Shcherbata

A 56 - Introduction to basic histology techniques

Date: tbd

Place: Max-Planck Institute for Biophysical Chemistry, Tower 6, 2nd floor

No. of participants: min. 2, max. 6

Duration: 2-3 days

Time on Day 1: 10:00 a.m.

Preparatory meeting: none

Short description: Although histological methods are one of the oldest methods in biology, in a modern world they are still widely used to investigate disease etiology, progression, and manifestation in humans and in animal models and for the newest tissue engineering methods. This laboratory course is designed to introduce graduate students to the fundamentals of histological analysis. Students will gain practical experience with fixation, paraffin embedding, microtome sectioning, H&E and immunofluorescent antibody staining and basics of histological analysis. We will use Drosophila as a model for muscular dystrophy, since we have previously shown that Drosophila mutants show age-dependents muscle degeneration. Various animal models have been widely used in the life sciences and medical research with hope to be eventually used to study disease prevention and treatment. Analysis in Drosophila helps us to better understand the origin of muscular dystrophy and mechanisms of muscle degeneration. Students will analyze and compare at the fluorescent microscope level the physical appearance of the normal versus abnormal degenerated tissue and evaluate the levels of muscle degeneration.

Contact: Dr. Halyna Shcherbata, Tel. 551 201-1656 (hshcher@gwdg.de)

George Sheldrick

A 57 - Methods in Chemistry II: Diffraction methods

Date: Wednesdays (weekly during summer semester), 11:15 – 13:00: first lecture 15th April 2009

Place: Windaus lecture room (Chemistry lecture room III, MN29)

Written exam: 16 July 2008, 11:00-13:15 h

Short description: This course is held alternately in German in the Winter Term and in English in the Summer Term. It takes the form of a lecture (about 60 minutes) followed by exercises (about 30 minutes) in the same room. Successful participation in these exercises will be rewarded with a maximum of two points each week; these are added to the mark for the written exam to give the final grade. After passing this exam, there is a one week project on crystal structure determination that is performed in groups of 2 or 3 students. The Schein “Methoden der Chemie II” is awarded after successful completion of the course including the project.

This course is expected to be of interest to the following groups of students:

1. Students in "Chemie Hauptstudium" who prefer to do the course in English or who do not want to wait until the Winter Term to be able to do it in German.
2. Students who unfortunately failed to pass the exam at the end of the Winter Term 2006-7. The exam will be set in English but may be answered in English or German.
3. Ph.D. students in the MSc/PhD Molecular Biology program.
4. Ph.D. students of GGNB planning to determine their own crystal structures.
5. Ph.D. students from abroad etc. who are required to attend an inorganic chemistry course as part of the Ph.D. qualification at the University of Göttingen
6. Exchange students wishing to attend a course that their own universities are likely to recognize.
7. Students who wish to be able to determine their own crystal structures in the course of their diplom, M.Sc. or Ph.D.

Content of Course: Symmetry of molecules and crystals. Space groups, X-ray diffraction by single crystals. Reciprocal space, direct and Patterson methods of solving structures. Structure refinement and validation, neutron diffraction, determination of absolute structure, synchrotron applications, structural data bases.

Recommended books: Clegg, W. "Crystal structure determination". OUP 1998 (reprinted 2002) ISBN 019-855-901-1 (16 Euros). Massa, W., Crystal structure determination", second English edition translated by R. O. Gould, Springer 2004, ISBN 3-540-20644-2 (45 Euros). Copies are available in the Inorganic Chemistry Library.

For questions concerning the course I have a "Sprechstunde" each Tuesday from 8:30 to 9:30 am.

Contact: Prof. George Sheldrick, Tel. 0551 39 3021, 3022, gsheldr@shelx.uni-ac.gwdg.de

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George Sheldrick

A 58 - Advanced crystal structure analysis

Date: Thursdays, 8:45-10:15: 16 April until 16 July 2009

Place: Hodgkin seminar room (MN26, Tammannstr. 4)

Short description: This course assumes knowledge of the material covered in MC2 and this term will primarily cover small molecule structure determination, including charge density.

Topics to be covered in the course include: X-ray data collection, phasing and refinement of crystal structures, and verification of the results.

Recommended literature: Clegg, William:Crystal Structure Determination. -Oxford; New York : Oxford Univ. Pr., 1998 (repr. 2004)ISBN 0-19-855901-1Massa, Werner:Crystal Structure Determination. -2nd compl. rev. ed. -Berlin, Heidelberg, New York : Springer, 2004ISBN 3-540-20644-2

Contact: Prof. George Sheldrick, Tel. 0551 39 3021, 3022, gsheldr@shelx.uni-ac.gwdg.de

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Mikael Simons

A 59 - GFP proteins and their application (FRAP, FRET, photo activation)

Date: tbd

Place: MPI-em – AG Simons – Hermann Rein Str. 3

No. of participants: 2-8

Duration: 2-3 days

Time on day 1: 9:00 a.m.

Preparatory meeting: none

Short description: Fluorescent proteins such as green fluorescent protein (GFP) from the can be fused to any protein of interest to analyze protein dynamics in living cells.

The fluorescent proteins have provided an important new approach for understanding protein function and they have been used as tools in numerous applications, for example as probes to monitor protein-protein interactions, as photo-modulatable proteins to study the dynamics of specific protein populations, and as biosensors to monitor biological processes and signals.

We will discuss the possibilities of how to use GFP in experiments and demonstrate three examples of their application (acceptor-photobleaching FRET, FRAP and photoactivation of a fluorescent protein).

Contact: PD Dr. Mikael Simons, Tel. 0551-3899533, msimon@gwdg.de

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Christine Stadelmann-Nessler

A 60 - Non-radioactive in situ hybridization

Date: tbd

Place: Klinikum, Dept. of Neuropathology, Robert-Koch-Str. 40

No. of participants: min.2, max. 3

Duration: 2 or 3 days

Short description:

- Non-radioactive in situ hybridization: The students will perform non-radioactive in situ-hybridisation for myelin proteins on brain sections of mice and rats.
- Immunohistochemistry for light and fluorescence microscopy. The students will perform immunohistochemistry for inflammation-related proteins (e.g., CD3, Mac-3) on brain and spinal cord tissue from animals with experimental autoimmune encephalomyelitis.

Contact: Prof. Dr. C. Stadelmann-Nessler, Tel. 0551 -39 8467, cstadelmann@med.uni-goettingen.de

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Holger Stark

A 61 - 3D structure determination of macromolecular complexes by single particle cryo-EM

Date: tbd

Place: MPI-bpc, 3D-Cryo Electron Microscopy lab

No. of participants: max. 2

Duration: 2 days

Time on day 1: tba

Preparatory meeting: none

Short description: The course covers sample preparation procedures for studying large macromolecular complexes by electron cryo-microscopy. Macromolecules will be imaged in the electron microscope. A set of noisy two-dimensional projection images is obtained which can be used to compute the 3D reconstruction of the macromolecular complex making use of advanced computational image processing strategies.

Contact: Prof. Holger Stark, Tel. 0551 - 201 1305, holger.stark@mpibpc.mpg.de

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Claudia Steinem, Andreas Janshoff

A 62 - Atomic force microscopy of surfaces: basic imaging techniques and data analysis

Date: 2nd half of the year

Place: Institut für Organische und Biomolekulare Chemie, Tammannstr. 2

No. of participants: min. 2, max 3

Duration: 2 days including seminar and practical course

Preparatory meeting: none

Short description: The basic principles of the AFM technique will be taught. Different surfaces will be imaged with the main emphasis on biological samples such as membranes and cells.

Contact: Prof. Claudia Steinem, Tel. 0551 – 39 3294, csteine@gwdg.de

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Walter Stühmer, Luis Pardo

A 63 - Patch Clamp

Date: tbd

Place: MPI-em, Molecular Biology of Neuronal Signals, Labs C203/C207

Number of participants: min 2, max 6

Duration: 2.5 days

Preparatory meeting: none

Short description: General introduction to the patch clamp technique with emphasis on whole cell recording of potassium voltage gated and P2X ion channels

Contact: Prof. Dr. Walter Stühmer, Tel. 0551 3899-646, ws@em.mpg.de

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Kai Tittmann, Stefan Lüdtke, Jörn Belter

A 64 - Principles and methods of protein purification by chromatography

Date: tbd (October)

Place: Ernst-Caspari-Haus / GZMB building, ground floor, Dept. of Bioanalytics

No. of participants: min. 6, max. 10

Duration: 2 days

Preparatory meeting: none; lectures on Day 1 and 2

Short description: The purification of recombinant proteins or proteins from native sources is a routine technique in modern biochemistry. In this course, participants will be trained in operating the most-commonly utilized protein chromatography system Äkta with an emphasis on hardware operation and maintenance, software programming and data evaluation. General strategies and principles of gel filtration, ion exchange and affinity chromatography will be experimentally demonstrated.

Contact: Prof. Kai Tittmann, ktittma@gwdg.de, Tel. 0551-39 14430

Kai Tittmann, Stefan Lüdtke, Jörg Fanghänel

A 71 - Thermodynamic characterization of biomolecular interactions by isothermal titration calorimetry

Date: 23.-24.03.2009

Place: Ernst-Caspari-Haus / GZMB building, ground floor, Dept. of Bioanalytics

No. of participants: min. 4, max. 6

Duration: 2 days

Preparatory Meeting: no, lectures on Day 1 and 2

Short description:

Isothermal titration calorimetry (ITC) has emerged as one of the most sensitive and powerful techniques for a rigorous thermodynamic characterization of biomolecular interactions such as protein-protein or protein-ligand interactions. Thus far, ITC is the only technique that determines directly the key thermodynamic parameters of a given interaction including the dissociation constant K_D, the Gibbs free energy of binding ΔG and its individual enthalpic (ΔH) and entropic contributions (ΔS), the stoichiometry n and the heat capacity Δc_p. This short course is aimed to provide the theoretical background of microcalorimetry as well as practical training for planning and performing ITC experiments. The binding interaction of trypsin and soybean trypsin inhibitor will be thermodynamically studied by the participants using the most advanced isothermal titration microcalorimeter iTC_{200} manufactured by Microcal.

Contact: Prof. Kai Tittmann, ktittma@gwdg.de, phone: 0551-39 14430

Henning Urlaub, Carl Schmidt, He-Hsuan Hsiao, Florian Richter

A 65 - Sequence analysis of proteins and their post-translational modifications by MALDI-ToF and electrospray ionization (ESI) mass spectrometry

Dates: tbd

Place: Department Lührmann / Mass Spectrometry

No. of participants: min. 2, max. 4

Duration: 2 days

Time on Day 1: 10:00 a.m.

Preparatory meeting: yes, date to be confirmed

Short description:

Day 1: Theory: Mass spectrometry (MALDI vs. ESI) and Proteomics. Practical work: In-gel-digestion of phosphorylated and non-phosphorylated proteins.

Day 2: Extraction of peptides, Peptide mass fingerprint analysis in MALDI-ToF, Nano sequencing of peptides in ESI mass spectrometer.

Day 2 and 3: Nano sequencing of peptides in ESI mass spectrometer. Identification of phosphorylation sites in MALDI and ESI mass spectrometers.

The Ph.D. students will not obtain any information what kind of protein they have to analyse and where the modification site is located. It will be their task to identify the protein and its modification site. SDS gels with already stained proteins will be provided.

Contact: Dr. Henning Urlaub, Tel. 0551 201-1060/1470, henning.urlaub@mpibpc.mpg.de

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Lutz Walter, Philip Kruse

A 66 - Isolation of recombinant proteins by affinity chromatography and binding studies

Date: tbd

Place: Dept. of Primate Genetics, German Primate Center

No. of participants: tbd

Duration: 2 days

Time on Day 1: tbd

Preparatory meeting: none

Short description: We will prepare eukaryotic fusion proteins consisting of killer cell immunoglobulin-like receptors (KIR) of natural killer cells and the Fc portion of human IgG1. Fc-KIR fusion proteins will be

collected from supernatant of transiently or stably transfected cells and isolated by affinity chromatography using protein A sepharose columns. After isolation Fc-KIR proteins are multimerised and fluorescently labelled and will be used to test specific interactions with MHC class I molecules.

Contact: PD Dr. Lutz Walter, Tel. 0551-3851 161, lwalter@gwdg.de

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Lutz Walter, Markus Brameier

A 67 - Introduction to Bioinformatics Methods

Date: tbd

Place: German Primate Center (DPZ), Kellnerweg 4

No. of participants: min. 2, max. 4

Duration: 2 - 3 days

Time (on day 1): 9 am

Preparatory meeting: none (introductory seminar on day 1)

Short description: The course is designed for graduate or undergraduate students and will introduce into basic computational methods and databases in bioinformatics with a focus on genome analysis.
Besides seminar discussions there will be practical exercises. By the end of the course participants should be able to access genomic and genetic data from the internet and process data by using the relevant web servers. While this is not compulsory, participants are encouraged to bring their own (virus free) computer.

Contact: Dr. Markus Brameier, Tel. 0551 3851 481, brameier@dpz.gwdg.de

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Lutz Walter, Jens Gruber

A 68 - Mechanisms of RNA silencing

Date: tbd

Place: German Primate Center (DPZ), Kellnerweg 4

No. of participants: min. 3, max. 6

Duration: 2 - 3 days

Time (on day 1): 9:00 am

Preparatory meeting: none (introductory seminar on day 1)

Short description: The course is designed for graduate students and adresses fundamental questions in the field of RNA interference (RNAi). RNA silencing will be discussed as (I) an endogenous mechanism for gene regulation via microRNAs and (II) as a tool for efficient functional gene characterization in reverse genetics approaches.

The practical part of the course will cover RNAi techniques such as siRNA transfection and gene knockdown detection as well as miRNA expression analysis via multi-reporter gene constructs.

After finishing the course the participants should be able to plan and perform simple RNAi experiments, including functional genetics and miRNA analysis.

Contact: Dr. Jens Gruber, Tel. 0551 3851 481, jgruber@dpz.eu

Ernst Wimmer, Gregor Bucher

A 69 - Parental RNAi in Tribolium

Date: between May 4th and May 18th 2009

Place: Dept. of Developmental Biology, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: min. 3, max. 6

Duration: 1.5 days and 1 half day 14 days later.

Preparatory meeting: tba

Short description: On the first day we will produce double stranded RNA from PCR templates and learn to inject female *Tribolium* (red flour beetle) pupae (one day). The next day we will inject the dsRNA into pupae (half a day). Approximately 13 days later, we will collect the offspring for you and prepare the cuticles. Together, we will analyze them for RNAi phenotypes. A short introduction to RNAi and systemic RNAi will be given (half a day). You are welcome to knock-down the ortholog or your favourite gene (you just have to clone the gene before - we will help you with the identification and cloning of the ortholog).

- Parental RNAi: Production of dsRNA
- Parental RNAi: Microinjection of dsRNA in female Tribolium pupae
- Cuticula preparations of Tribolium larvae
- Analysis of the cuticula preparations for RNAi-induced phenotypes

Contact: Gregor Bucher, Tel. 0551 39 5426, gbucher1@gwdg.de

Andreas Wodarz, Nils Halbsgut

A 70 - Confocal microscopy on whole mount preparations of Drosophila *embryos*

Date: tbd

Place: Department of Stem Cell Biology, Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11

No. of participants: min. 2, max. 4

Duration: 2 – 3 days

Time on Day 1: 10:00

Preparatory meeting: none, short seminar on Day 1

Short description: We will collect *Drosophila* embryos and fix them for staining with a collection of tissue-specific primary antibodies and dyes, followed by detection of the primary antibodies with fluorescent secondary antibodies. The whole mount preparations will then be mounted on slides and analyzed by multichannel confocal microscopy. Our confocal setup (Zeiss LSM 510 Meta with 405 nm laser diode) allows the simultaneous detection of up to 10 different fluorescent dyes. In the course we will visualize different tissues and subcellular structures and will demonstrate the aquisition of image stacks and 3D-reconstruction.

Contact: Nils Halbsgut, Tel. 0551-39-13720, nhalbsg1@gwdg.de

B.2 Professional Skills Courses

Heather Silyn-Roberts

(University of Auckland, New Zealand)

S 01 - Effective scientific communication: journal papers, seminar or conference presentations, and posters

Date: tbd

Place: Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11, seminar room 0.233

No. of participants: min. 5, max. 20

Duration: 3 d

Time on Day 1: 10:00 a.m.

Preparatory meeting: none

General description:

The aim of these courses is to introduce graduate students to the principles of scientific communication: writing a journal paper; making an effective scientific conference poster; and making a professional seminar or conference oral presentation of scientific material. The presenter is multi-disciplinary and the courses are adapted to each graduate school.

1. Writing and Publishing an Effective Journal Paper (half-day programme)

Participants should bring a journal paper that they have written or are familiar with; each participant will analyse this paper during the course.

Aim: To help participants understand the following: the characteristics of an effective paper; requirements for each section of a paper; what reviewers and editors look for; the process of publishing a paper.

To be covered: The general structure of a journal paper. Then, for each section: the purpose of the section; how to write it; difficulties in writing it; tense of the verb; common faults; review checklist.

Method of learning:

- PowerPoint presentation by Heather Silyn-Roberts.
- Group discussion between presenter and participants.
- Participants' individual assessment of the papers they have brought with them.

2. Making an Effective Conference Poster (half-day programme)

Participants should bring examples of conference posters. These will be analysed during the course.

Aim: To help participants construct for a conference a display poster that effectively communicates the essential elements of a piece of scientific work.

To be covered: Features of posters that viewers like; planning; design and structure of information; figures and tables; effective and ineffective features of posters; review checklist.

Method of learning:

- PowerPoint presentation by Heather Silyn-Roberts.
- Discussion of the requirements.
- Participants' assessment and grading of posters (posters brought by participants, photos).

3. Making an Effective Seminar or Conference Presentation (1 day, maximum 12 students per day)

Each participant should prepare beforehand a five-minute oral presentation (with visual aids: Powerpoint or overhead foils) on an aspect of his/her work. Each presentation is given once, then improved and presented a second time.

Aim: To help participants learn how to use the skills of rhetoric, structuring of information, and preparation of visual aids to present scientific information in a professional manner at a conference or seminar. To learn what to avoid doing.

To be covered: Guidelines for beginners; types of notes; structuring a presentation; using overview information at the beginning and end; dealing with detail; spoken style; wording (your own, visual aids); designing visual aids; delivering the talk; dealing with needing to pause, interruptions, finishing in a hurry; answering questions.

Method of learning:

- All participants will present a prepared five-minute seminar based on their work. Each presentation is followed by group discussion analysing the effective and ineffective points.
- PowerPoint presentation by Heather Silyn-Roberts of what to do and what not to do when making a scientific presentation.
- Time allowed for participants to improve their presentation, followed by the second, improved version by each participant. Group discussion after each presentation. Also practice in finishing in a professional manner when one's time has run out.
- NOTE: each participant who has gone through this course has shown a marked improvement in presentation technique and confidence in the second presentation.

Biographical details of the presenter

Heather Silyn-Roberts, BSc *Honours*, PhD (Biomechanics), was educated in Great Britain and is Senior Lecturer (equivalent to C3 professor) in Mechanical Engineering at the University of Auckland, New Zealand. Her main teaching responsibility is the four-year core programme in Professional Development in the Faculty of Engineering. She has a long connection with the University of Tübingen; she was a post-doctoral fellow there in Biomechanics in 1985-6, and has since returned nearly every year.

She has run annual programmes in scientific communication for graduate schools in MPIs and universities in Germany since 1997. She speaks German; the course is run in English so that participants gain experience in clearly spoken scientific English, but questions can be taken and answered in German if necessary. Her research background is a combination of biological sciences, engineering, physics and medicine, and she is at ease in all scientific disciplines. She also has a very broad working knowledge of non-scientific disciplines.

In addition to working with undergraduate and graduate students, she also acts widely in Australasia as expert consultant to large engineering organisations that need to improve their documentation.

She has written three books (one now in its second edition):

1. Engineering Communications: a Handbook for Civil Engineers. 2004. The American Society of Civil Engineers. Written by invitation of ASCE. 251 pages.
2. Writing for Science and Engineering: Papers, presentations and reports. 2000, Butterworth-Heinemann (UK). 281 pages. ISBN: 0-7506-4636-5. Written for graduate students and junior professionals.

Is extensively used as a required or recommended textbook for graduate courses in engineering and science in USA and UK.

3. Writing for Science: A practical handbook for science, engineering and technology students, 2nd edition 2002, Pearson Education, Auckland. 180 pages. ISBN: 1-877258-34-2. Written for undergraduate students.

First edition 1996: was used as a textbook in universities in Great Britain, Australasia and South Africa. Translated into Japanese, Asakura Publishing, 1998.

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Volker Grimm

(Helmholtz-Zentrum für Umweltforschung, Leipzig)

S 02 - Scientific Writing

Date: 7 May 2009

Place: Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11, seminar room 0.233

No. of participants: min. 5, max. 20

Duration / Time: 1 day / 10:15 – 18:00 h

Preparatory meeting: none

Outline: One of the main challenges that PhD students have to face is getting published. They are thus confronted with various requirements that are not covered by traditional curricula, e.g. how to structure material for scientific publication, how to communicate results persuasively or what elements distinguish an article that is published from one that is rejected. This course intends to convey the skills necessary to overcome these shortcomings. The course aims at supporting PhD students to improve their skills with regards to preparing and writing a scientific paper, and to provide the basis for further self-teaching of scientific writing. The course is designed for students close to or already in the process of writing their first publications, so that the short writing exercises during the course can be directly related to their own work and publications.

Course content

- First steps: key messages
- Organization first: Results (Tables and Figures)
- Where to submit?
- Getting started: Title, Abstract, Introduction
- Reader's expectations
- Methods and Results
- Discussion
- Dealing with editors and reviewers

Course method

- Lectures
- Writing drafts
- Discussions

About the teacher: PD Dr. Volker Grimm is a scientist in the Department of Ecological Modelling at the Helmholtz Center for Environmental Research in Leipzig. He is offering the scientific writing course at various graduate schools.

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Anke Wagner

(Steinbeis Team Northeast, Greifswald, Germany)

S 03 - Poster design and presentation

Date: 21 April 2009

Place: Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11, seminar room 0.233

No. of participants: min. 5, max. 20

Duration: 1 day

Time on Day 1: 10:00 a.m.

Preparatory meeting: none

Course outline: The workshop introduces state-of-the-art methods for the presentation of research results with a special focus on design and presentation techniques for scientific posters. The students learn how to prepare a poster step by step: structuring their contents, applying presentation principles and finally designing an attractive and informative poster. Since the workshop is mainly based on practical exercises, the participants are requested to bring along contents (charts, pictures, tables, texts) from their research projects in order to draft or even design their own scientific poster. The results are presented and analysed in the group. The participants learn how to present their research results to proficiently address their respective target groups at scientific conferences, fairs or popular scientific events

Structure of the workshop:

First Step: Fundamentals

- Target groups
- Institutional Corporate Identity
- Design software and printing standards

Second step: preparatory work

- Phrasing the message ► Practical exercise
- Title, text blocks, listings
- Pictures, charts, tables ► Practical exercise

Third step: Organizing the material

- Directing attention to your poster
- Guiding the reader ► Practical exercise

Fourth step: Design details
- Typography and layout
- Do's and dont's ► Practical exercise

Fifth step:
- Presenting your poster ► Practical exercise

About the trainer: Anke Wagner is responsible for science marketing and graphic design within the Steinbeis Team Northeast. She holds a degree in political sciences, linguistics and psychology from the Ernst Moritz Arndt University Greifswald. During several years as public relations manager at the Leibniz Institute for Plasma Science and Technology in Greifswald she was responsible for the creation of design templates for all publications of the institute and advised the institutes scientists in presentation of research results during conferences, fairs and to the non-scientific public. In 2005 she started her own business in scientific marketing and design as part of the Steinbeis Team Northeast. Anke Wagner is involved in a number of international EU-funded projects and designed widely-used public relation materials, e.g. for *Trayss Prime*, *Boosting Baltic* and *Boost Biosystems*. She is currently coaching several research institutes as well as small enterprises in presenting their scientific and business results and designing their public relations material.

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Janet Yagoda Shagham
(University of Albuquerque, New Mexico, USA)

S 04 - Science and Medical Writing for the Public

Date: 11 – 22 May 2009

Place: European Neuroscience Institute (ENI), Seminar Room Ground Floor, Grisebachstr. 5

No. of participants: min. 5, max. 15

Duration: 7.5 course days; 9:00 – 15:30 h daily

Preparatory meeting: none

Description: There are many career opportunities for people able to translate and interpret medical and scientific information for peer and public readers. In addition to print and broadcast media, science writers work for universities, hospitals, industries, museums and government agencies. Freelancing is another satisfying way to approach this profession.

Students who take this class will learn the art and craft of writing for public audiences. The class format includes lecture and discussion, field trips, workshop time and critiques. Students will write 2 to 3 articles and have the potential to publish one article in the MPI News. Writing opportunities may include:

- The Neurizons Conference that takes place from May 13 to 16.
- A community Denkbar event
- A field trip to Otto Bock company

Co-registration with the Neurizons Conference, May 13-16, is encouraged, but not required.

About the trainer: Janet Yagoda Shaghan is a lecturer at the Department of English at the University of New Mexico and Freelance Medical and Science Writer.

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Alexia and Stephan Petersen

S 05 - Working across borders, communicating across cultures I: An introductory workshop to intercultural communication for Graduate Students

Date: 8 -10 May 2009

Venue: Altes Forsthaus Germerode, Abteröder Straße 1, 37290 Meißner, phone: 05657-678 www.altes-forsthaus-germerode.de)

Number of participants: min. 7, max. 20

Duration: 2.5 days

Time on Day 1: 17 h

Preparatory meeting: none

Course outline:

What is "intercultural communication"?

Intercultural communication looks at a very few key cultural concepts (e.g. fact-based vs. relationship-based interpersonal interactions, individual vs. group orientation, the role of hierarchy, to name a few) and how these in their various constellations impact the communication behaviour of different cultures in every-day problem-solving, decision-making, project-planning, workplace interaction, etc. It is not about compiling simplified *do's* and *don'ts* checklists for specific countries. Nor is it about coming up with the "correct" interpretation of every cross-cultural situation. In realistic, functional terms, intercultural communication skills enable one to first distinguish which problems encountered by workgroups are in fact cultural communication problems, rather than issues of individual personality or technical competence. In the case of a multicultural group, isolating and understanding the impact of key cultural issues on group dynamics puts one in a position to make a *reasonable* assessment of a situation and take the steps of effective action.

How do scientific and technical professionals benefit from intercultural communication skills?

The predominance of foreign students and professionals in scientific and technical programmes throughout the world means that many universities and research institutions are host to some of the most culturally diverse work teams one is likely to encounter. Within such organisations where cultural differences can be quite pronounced and rather the norm, the effectiveness of the workgroup may well hinge on the complete skills package of certain key persons; for instance, persons working in positions where they need to influence others or co-ordinate the work of others to achieve specific objectives. Given this reality, intercultural communication skills must be more than just "something extra": they are the key to accessing the full synergistic potential within a multicultural group.

Experienced managers, engineers and other internationally active professionals consistently recognise the considerable barriers posed by cultural differences, and the challenge posed to overcome them. Given this reality, it is not inconceivable that intercultural communication awareness and skills development are equally relevant and challenging as a central issue for students of all disciplines.

How can intercultural communication skills be trained?

The models and tools delivered here are conceptualised to help start the long process the learner must undertake to construct and refine his/her own cultural model through research, experience, observation and objective analysis. The workshop, therefore, trains participants in transferring their their understanding of patterns of "cultural logic" into an ability to recognise and assess *reasonably accurately* cultural patterns of communication behaviour, which in turn enables informed action and solutions. Using typical, authentic case studies, real-life samples for group problem-solving activities, and role-play simulations, the strength of the design of this workshop, especially with regards to professional or academic user groups, lies in its integration of the relevant academic knowledge into a solid conceptual framework that is taught with an applications-oriented approach specifically tailored to the user's needs.

About the trainers: Alexia Petersen is an intercultural communication trainer from Toronto, Canada, based for the last 18 years in Germany. Together with Dr. Stephan Petersen, an engineer and manager with a company active world-wide, she consults to a wide range of companies, non-profit organisations, government and cultural institutions, and also teaches intercultural communication at the RWTH Aachen and other universities

in Germany. Further information about the trainer and the course they offer are available at http://www.aspetersen.de.

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Alexia Petersen

S 06 - Working across borders, communicating across cultures II: Creating intercultural synergy in multicultural teams

Advanced Intercultural Communication Seminar for Graduate Students, University of Göttingen

Date: 2 – 4 September 2009

Venue: tba

No. of participants: 7-14

Duration: 2 days

Time on Day 1: 10 a.m.

Preparatory meeting: start-up session on the day before the start of the workshop

Course outline:

Aim and content

- Review and consolidate the foundational framework for key cross-cultural principles introduced in the Introductory Workshop to Intercultural Communication
- Provide a further focus on the advanced application of concepts learned in the introductory workshop, with an emphasis on the inter-relationship of key cultural principles in specific communication tasks such as conflict management, negotiation, leadership skills, and team-building
- Train participants in the advanced application of tools in specific task scenarios typically encountered by both company internal work groups and external multicultural teams.

Seminar description

The design of this advanced level practice-oriented workshop is to address a single pedagogical problem: although students are graduating with technical and scientific skills to analyse and solve problems in their respective disciplines, they receive relatively little to no training in the “soft” skills of communication, collaboration, and leadership necessary to practise their profession in a multicultural, complex, and often ambiguous professional world. This workshop builds on the foundation framework already introduced in the introductory seminar on intercultural communication, and focusses on the advanced applications of the basic set of knowledge and tools on special communication tasks such as conflict recognition and resolution, negotiation, leadership skills and team-building --- all of which are essential to both an effective participation in and management of a culturally diverse work environment.

As in the introductory level workshop, this 2-day workshop also draws on classic “set pieces” in cross-cultural communication, such as negotiating contracts and deadlines, managing conflicts in multicultural teams, optimising multicultural teams, and providing leadership. Such authentic, complex case studies and scenarios, therefore, prepare students for the day to day business and managerial aspects of the professional scientific world. Following on the cultural core-values approach (dimensions such as individualism/collectivism, hierarchy, fact-based/relationship-driven interaction, etc.) to assessing communication paradigms, the advanced level workshop will continue to take a cultural values-based perspective on assessing conflict, negotiation tactics, motivational and effective leadership, and synergistic team-building.

The guiding principles throughout the workshop are once again the basic paradigmatic communication styles, which function as both a conceptual framework and tool in the training of each application. Each section of the workshop follows a clear structure punctuated by key examples as the basis of exploratory analysis and discussion, conceptual clarification, consolidation of key learning points, activities to apply tools to create strategies, and finally a group activity to facilitate the translation of knowledge into skills.

Main topics of the workshop will include:

- A review of the basic principles of the communication Paradigm Scale and "Paradigm-Shifting"
- Cultural differences in conflict resolution tactics
- Different cultural attitudes to contracts and deadlines
- Developing strategies to approach cross-cultural negotiation (contracts, deadlines, conflict, price and conditions)
- How to map synergistic "Creator Teams"
- Case study work, group problem-solving activities, role play simulation

About the trainer: Alexia Petersen is an intercultural communication trainer from Toronto, Canada, based for the last 18 years in Germany. Together with Dr. Stephan Petersen, an engineer and manager with a company active world-wide, she consults to a wide range of companies, non-profit organisations, government and cultural institutions, and also teaches intercultural communication at the RWTH Aachen and other universities in Germany. Further information about the trainer and the course they offer are available at http://www.aspetersen.de.

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Simon Golin

(Golin Wissenschaftsmanagement, Hamburg)

S 07 – Project management for young scientists

Date: Courses A: 6 April 2009, Course B: 14 September 2009

Place: Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11, seminar room 0.233

No. of participants: min. 8, max. 15

Duration: 1 day (offered as a combined course with S 08: Time management in doctoral research: Aligning time and goals)

Time: 10:00 – 18:00 h

Preparatory meeting: none

Course outline: New, time limited and complex – such are the tasks generally undertaken as projects. A work environment without project work is almost unimaginable nowadays. And this is not only true for the non-academic sector: Even the doctorate is a project!

Proven project management tools pave the way for the professional development and planning of projects, for competent guiding of their implementation and for their successful completion. With the help of these tools even difficult steps in the project journey can be safely navigated.

During the workshop the participants familiarise themselves with the most important project management methods and instruments. The following topics are at the core of the workshop:

- Basics of project management: From design to completion of a project

- It is all about direction: Setting objectives for my projects

- How to handle the unforeseen: Strategies for dealing with difficulties

- Projects in the higher education sector: What are the idiosyncrasies of academia?

- Strengthen your strengths! How can I exploit the strengths of my project?

- Stakeholder analysis: Where do I find support for my project?

- Project management: My next steps

About the trainer: Dr. Simon Golin is head of the consultancy company golin wissenschaftsmanagement. He has more than 15 years experience in not-for-profit management, in particular in science, education, and the foundation sector. His roles include managing director of the "Deutscher Studienpreis" at the Körber Foundation, secretary general of the German National Ethics Council, and secretary general of the Academy of Sciences and Humanities in Hamburg.

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Simon Golin

(Golin Wissenschaftsmanagement, Hamburg)

S 08 – Time management in doctoral research: Aligning time and goals

Date: Course A: 7 April 2009, Course B: 15 September 2009

Place: Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11, seminar room 0.233

No. of participants: min. 8, max. 15

Duration: 1 day (offered as a combined course with S 07: Project management for young scientists)

Time: 10:00 – 18:00 h

Preparatory meeting: none

Course outline: Teaching, part time work, professional development, private arrangements and not least the thesis: Time pressure results in many things only being half done. In the end there is not enough time for the important tasks and you are left with the uncomfortable feeling of again not having managed everything.

It is however not difficult to improve dealing with the personal time budget. Through the implementation of established time management methods, individual disturbances can be minimised, priorities can be set and planning horizons can be determined in order to make the own work more effective.
During this workshop the participants learn the fundamentals of time management and deal mainly with the following topics:

- Basics of time management: Setting goals and priorities
- Efficiency versus effectiveness: The subtle difference
- Structuring your time: My planning horizon
- Would 'ave, could'ave, should'ave: Disturbances & time-wasters – both self-inflicted & caused by others
- Expect the unexpected: Strategies for dealing with the unplannable
- Time management: My next steps

About the trainer: Dr. Simon Golin is head of the consultancy company golin wissenschaftsmanagement. He has more than 15 years experience in not-for-profit management, in particular in science, education, and the foundation sector. His roles include managing director of the "Deutscher Studienpreis" at the Körber Foundation, secretary general of the German National Ethics Council, and secretary general of the Academy of Sciences and Humanities in Hamburg.

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Simon Golin

(Golin Wissenschaftsmanagement, Hamburg)

S 09 – Team work & leadership competencies in academia and beyond

Date: 11 May 2009

Place: Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11, seminar room 0.233

No. of participants: min. 8, max. 15

Duration: 1 day

Time on Day 1: 10:00 – 18:00 h

Preparatory meeting: none

Course outline: When PhDs make the transition into the labour market they are often expected to take on leadership responsibilities. Not only careers outside the higher education sector but also such in academia

involve leadership roles – e.g. in the supervision of students or junior colleagues or the 'lateral guidance' of colleagues. A better understanding of leadership mechanisms is also useful in situations where one is being led, for example as a PhD candidate by a supervisor. 'Bottom up' leadership techniques can contribute to the success of cooperation in this context. With sound knowledge of leadership, team dynamics can be optimized and situations of conflict better managed. New recruits can therefore grow with their leadership role and constructively work with their colleagues.

In this workshop participants will be introduced to the most important leadership styles and techniques and will acquire knowledge of the methodical approach to leadership tasks. The following topics will be covered:

- >> Basics of team work & leadership: An overview of leadership tasks and styles
- >> My leadership profile: Stocktaking of my key skills
- >> Ambiguous hierarchies: What does leadership mean in academia?
- >> Manager-employee discussions as a leadership tool: Setting common objectives
- >> Role change: Staff member – colleague – boss
- >> Keeping the peace: Conflict management and strategies for negotiation in the work place
- >> Being new in a position: My first 100 days as boss
- >> Team work & leadership competencies: My next steps

About the trainer: Dr. Simon Golin is head of the consultancy company golin wissenschaftsmanagement. He has more than 15 years experience in not-for-profit management, in particular in science, education, and the foundation sector. His roles include managing director of the "Deutscher Studienpreis" at the Körber Foundation, secretary general of the German National Ethics Council, and secretary general of the Academy of Sciences and Humanities in Hamburg.

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Christina Schütte

(Pro Sciencia, Lübeck, Germany)

S 10 – Grant writing for scientists

Date: 17 April 2009

Place: Ernst-Caspari-Haus / GZMB Building, Justus-von-Liebig-Weg 11, seminar room 0.233

No. of participants: min. 8, max. 20

Duration: 1 day

Time: 10:00 -18:00 h

Preparatory meeting: none

Course outline: The aim of this course is to familiarize participants with the strategies for writing successful grant applications to various funding bodies (BMBF, DFG). The corresponding funding principles will be exemplified in exercises for preparing work plans and writing abstracts for grant applications.

Contents:

- General points to consider when writing a grant application
- Structuring a story
- General points on good scientific writing
- The different parts of a grant application and their contents
- strategies for successful grant applications: What information is necessary, how and where should it be presented?
- differences between different funding bodies and funding principles (stress on DFG-, BMBF- and EU-funding)
- common mistakes in grant applications and how to avoid them
- Analysis of grant abstracts provided by the participants (optional)
- Exercises for writing a grant abstract and for structuring a work plan

About the trainer: After finishing a master's in chemistry at the University of Freiburg and a PhD in biochemistry at the University of Bonn, Dr. Christina Schütte worked as a research associate at the Max Planck Institute for Biophysical Chemistry in Göttingen. Starting from her PhD work she was intensively involved in acquisition and management of funded research and education projects. In 2004 she was co-founder of the ProSciencia Beratungs-GmbH, where she focuses on acquisition and scientific management of technology-driven research projects as well as education and training. She has extensive first-hand experience in managing projects both in science and in educational surroundings.

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Christian Lenk

S 11 - Bioethics in Science and Research

Date: tbd

Place: European Neuroscience Institute (ENI), Seminar Room Ground Floor, Grisebachstr. 5

No. of participants: min. 5, max. 15

Duration: 2 days

Time on Day 1: 9:00 a.m.

Preparatory meeting: yes, date to be confirmed

Course outline:

Seminar overview

This seminar is designed to introduce students to some of the major topics of biomedical ethics, to provide a set of guidelines and tools for assessing ethical dilemmas in scientific research, and to facilitate a room for free discussion and exchange of opinions on some moral dilemmas raised by scientific advances. Special attention will be paid to real life situations, using a casuistic approach.

Duration and methods

Each student should prepare a presentation either on a topic of their choosing or about one of the topics suggested by the person in charge.

During the time prior to the beginning of the seminar, the course instructor will help students to define the detailed topics for their presentations and to find relevant bibliography. Each session includes introductory lecture/s and student presentations given by the person in charge. Time will be reserved to allow participants to present a specific topic relating to bioethics or research ethics, to summarize a case, or to make comments on relevant guidelines. The remainder of the time is reserved for discussion.

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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Dr. Bernd Seilheimer, Bayer Schering Pharma AG

S 12 - The Drug Discovery Process

Date: tbd

Place: European Neuroscience Institute (ENI), Seminar Room Ground Floor, Grisebachstr. 5

No. of participants: min. 5, max. 20

Duration: 2 days course (eventually 1 day excursion to Berlin)

Time on Day 1: tbd

Preparatory meeting: none

Course outline:

This special course focuses on how research in institutes, universities and biotech companies is translated by industry into new therapeutic approaches.

Students will learn the individual stages of the drug discovery process. The course will additionally provide a window onto the roles and qualifications of the scientists (e.g. biologists, chemists, pharmacokineticists, toxicologists, pharmacologists), project managers and research managers who run, coordinate and lead the process. Special sessions will be held on career opportunities along the drug discovery chain.

Drug discovery is driven by medical need. Nowhere is medical need more acute than in neurological disorders. No drug products are available which halt the progression of such illnesses as Alzheimer's disease, stroke or Parkinson's disease. Therefore, a case study of drug discovery for the indication stroke in industry has been selected as the learning method throughout the course.

Students should bring to the course a basic knowledge of neuronal cell death mechanisms.

The format of the course will be a kick-off meeting followed by a series of half and full day workshops.

The course is open to all final year undergraduates and postgraduates in related disciplines.

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Sabine Gildemeister

S 13 – Speed Reading Techniques I

Date*:* Course A*:* 3 – 4 April 2009; Course B: planned for fall 2009

Place: Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: 7- 20

Duration: 2 d

Time on Day 1: tbd

Preparatory meeting: none

Course outline: In this seminar you will be introduced to different techniques of speed reading. You acquire New Reading Choices which will help you to absorb more written material in less time. This can help you to read more quickly and joyfully. Be prepared to revise your beliefs about reading. There are many more techniques than you may be aware of.

When you use these speed reading techniques you are going to use your whole mind. You use the ability of your right and left brain as well as your subconscious mind to help you to integrate your reading material. You will learn the different steps which enable you to make use of this technique.

In particular:

- you learn different techniques of scanning the pages of a book, a magazine article, a text on the computer or whatever it is you may have to read for your particular purpose,
- you are offered ways to learn how to get into a relaxed state of mind which helps you to absorb more written material,
- we will also learn the technique of mind mapping which is a part of speed reading and also helpful as a learning technique.

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Sabine Gildemeister

S 14 – Speed Reading Techniques II

Date*:* tbd

Place: Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: 7- 20

Duration: 1-2 d

Time on Day 1: tbd

Preparatory meeting: none

Course outline: This seminar will build on the speed reading I seminar. Further details will be announced.

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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Ralf Petri

S 15 - Job hunting, interview skills and assessment centers

Date: tbd

Place: Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

No. of participants: 7-15

Duration: 1-2 d

Time on Day 1: tba

Preparatory meeting: none

Goals: The students learn that their own imaginations, wishes, values and goals are the prerequisite for the position they are looking for and that they have to come up with a clear vision of what they seek before they start to search for jobs. They receive a toolbox of tips and approaches they can use to find out what they seek and how to use this knowledge to find the right career. Under consideration of their individual CVs, strengths and weaknesses they learn that job search is everywhere and anytime and that there is nothing like a “golden rule” for applications. The path from an advertisement towards the final version of an application including cover letter, resume, and a personal page is demonstrated.

Interview skills are trained with practical exercises whereby students experience both parts of the interview, as interviewer and interviewee. This change of perspectives teaches them how difficult it can be to interview an applicant and how they, as an applicant, can help the interviewer with their answers and attitude. These mock interviews teach them to foresee the purpose of questions, how to deal with difficult or illegal questions and what questions they may expect. They receive individual feedback from the coach.

Assessment Centers (ACs) become increasingly important as a tool to directly compare promising candidates for a certain position, especially if leadership skills are required as for a group leader positions in industry. Usually, this is performed as a short AC within a day but it can also mean up to five days of constant pressure. Participants get to know typical exercises of ACs, learn how to deal with them and how to develop their own style of self-marketing.

Content:

Finding out what I want: Why is it important? What values count? And do private values count? How do I find out? How do I use that knowledge?

Job hunting: Some statistics about jon hunting. Different ways ob job hunting. The side of the employer. Tips and advice. Job hunt is individual.

Interview Skills: The power of picture in the mind. Picture influence our communication. Frame and content of interviews. Tips for interviews. The most important questions. Illegal questions. After the interview.

Assessment centers: Why are they used? What do they look for? Group discussions. Self-/Partner-Introduction. Short and spontaneous presentation.

Writing applications: Reading an advertisement. Finding additional information. Prioritize requirements. Finding answers to the requirements. Writing an application. Using power verbs.

Different careers: Difference between industry and academia. Alternative careers for scientists. Gathering information.

Teaching methods:

Trainer input. Handouts. Single- and group exercises. Role plays. Individual feedback. Feedback for participant's applications. Presentation of successful and failed applications.

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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Lektorat Deutsch als Fremdsprache

*S 16 - German language **intensive** courses / Level **A0***

Date: 22 Sep – 9 Oct 2009

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 4 h per day in the morning; Mo-Fr daily.

Preparatory meeting: none

Course outline: Intensive German language course for beginners without any background or previous course in the German language.

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous and full attendance is required to obtain credits!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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*S 17 - German language **intensive** courses / Level **A1***

Date: 22 Sep – 9 Oct 2009

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 4 h per day in the morning; Mo-Fr daily.

Preparatory meeting: none

Course outline: Intensive German language courses for students with some basic knowledge but no established communication skills in the German language (e.g. after completion of an A0 level course).

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous and full attendance is required to obtain credits!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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*S 18 - German language **intensive** courses / Level **B***

Date: 22 Sep – 9 Oct 2009

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 4 h per day in the morning; Mo-Fr daily.

Preparatory meeting: none

Course outline: Intensive German language courses for students with slightly advanced knowledge of and with basic communication skills in the German language (e.g. after completion of an A1 level course).

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous and full attendance is required to obtain credits!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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*S 19 - German language **intensive** courses / Level **C***

Date: 22 Sep – 9 Oct 2009

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 4 h per day in the morning; Mo-Fr daily.

Preparatory meeting: none

Course outline: Intensive German language courses for students with advanced knowledge of and with advanced communication skills in the German language (e.g. after completion of a B level course).

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous and full attendance is required to obtain credits!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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Lektorat Deutsch als Fremdsprache

*S 20 - German language **weekly** courses / Level **A0***

Date: *Module 1*: October-December; *Module 2*: January-March; *Module 3*: April-June

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 2 h at one evening per week; usually Tuesdays or Wednesday (depending on course, tba).

Preparatory meeting: none

Course outline: Weekly German language courses for beginners without any background or previous course in the German language.

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous attendance within each module is required!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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Lektorat Deutsch als Fremdsprache

*S 21 - German language **weekly** courses / Level **A1***

Date: *Module 1*: October-December; *Module 2*: January-March; *Module 3*: April-June

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 2 h at one evening per week; usually Tuesdays or Wednesday (depending on course, tba).

Preparatory meeting: none

Course outline: Weekly German language courses for students with some basic knowledge but no established communication skills in the German language (e.g. after completion of an A0 level course).

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous attendance within each module is required!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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Lektorat Deutsch als Fremdsprache

*S 22 - German language **weekly** courses / Level **B***

Date: *Module 1*: October-December; *Module 2*: January-March; *Module 3*: April-June

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 2 h at one evening per week; usually Tuesdays or Wednesday (depending on course, tba).

Preparatory meeting: none

Course outline: Weekly German language courses for students with slightly advanced knowledge of and with basic communication skills in the German language (e.g. after completion of an A1 level course).

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous attendance within each module is required!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

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Lektorat Deutsch als Fremdsprache

*S 23 - German language **weekly** courses / Level **C***

Date: *Module 1*: October-December; *Module 2*: January-March; *Module 3*: April-June

Place: different rooms, depending on course level (tba)

No. of participants; min. 5, max. 20

Duration: 2 h at one evening per week; usually Tuesdays or Wednesday (depending on course, tba).

Preparatory meeting: none

Course outline: Weekly German language courses for students with advanced knowledge of and with advanced communication skills in the German language (e.g. after completion of a B level course).

Students are assigned to courses according to their self-assessment. The trainers will advise on the first day of the course, whether the chosen level is appropriate or whether the participant should switch to another course.

Continuous attendance within each module is required!

Contact: GGNB office, Tel. 0551-39 14002 / 3/ 4, ggnb@gwdg.de

B.3 Industry Excursions

The industry excursions listed below are planned for 2009. Dates depend on the availability of the host. Excursions may involve an overnight stay. They usually involve a site visit including a guided tour through the facilities and a meeting with representatives of the human resources department.
Number of participants: min. 10, max. 20-25

X 01 BASF, Ludwigshafen

Date: tbd

Duration: 2 days

notes: Planned In combination with a visit of Heidelberg with overnight stay.

X 02 Boehringer Ingelheim, Biberach an der Riß / Ulm

Date: 2-3 June 2009

Duration: 2 days

Notes: Planned in combination with a visit of Ulm with overnight stay,

X 03 Schering (Dr Seilheimer), Berlin

Date: tbd

Duration: 1-2 days

Notes: In combination with course S 12 – The drug discovery process.

X 04 Sartorius, Göttingen

Date: tbd

Duration: half day

Notes: -

END OF COURSE CATALOGUE