Short Methods Courses & Method Seminars; Extended Methods Course

Sep 2011 - Feb 2012 (B)

* Course has also been offered in the previous course announcement (Mar-Aug 2011)

Department/Group	Supervisor(s)	ID	*	Title of Course	Credits	Date B
Biochemistry						
Feußner, Ivo	Herrfurth, Cornelia	A 16		Introduction to lipid analysis	1,0	End of Feb 2012
Höbartner, Claudia	Höbartner, Claudia	A 32	*	Chemical synthesis and enzymatic ligation of RNA and DNA oligonucleotides	1,0	23-24 Nov 2011
Jahn, Reinhard	van den Bogaart, Geert / Park, Yongsoo	A 33	*	Reconstitution of neuronal exocytosis	1,0	17-18 Oct 2011
Schmitt, Hans Dieter	Schröter, Saskia	A 34	*	BiFC (bimolecular fluorescence complementation) in yeast	1,0	Nov 2011
Jahn, Reinhard	Chua, John / Binotti, Beyenech / Boyken, Janina	A 35	*	Co-immunoprecipitation as a technique to study protein-protein interactions	1,0	12-14 Oct 2011
Jahn, Reinhard	Kühnel, Karin	A 36	*	Protein purification and characterization	1,0	13-14 Oct 2011
Tittmann, Kai	Schneider, Stefan / Cindy Wechsler	A 64	*	Principles and methods of protein purification by chromatography	1,0	28-29 Nov 2011
Urlaub, Henning	Atanassov, Ilian / Hofele, Romina / Karaca, Samir / Qamar, Saadia	A 65	*	Sequence analysis of proteins and their post-translational modifications by MALDI-ToF and electrospray ionization (ESI) mass spectrometry	1,0	18-20 Oct 2011
Walter, Lutz	Walter, Lutz	A 66	*	Isolation of recombinant proteins by affinity chromatography and binding studies	1,0	6-7 Oct 2011
Tittmann, Kai	Meyer, Danilo / Sitte, Astrid	A 71	*	Thermodynamic characterization of biomolecular interactions by isothermal titration calorimetry	1,0	1-2 Dec 2011
Fischle, Wolfgang	Fischle, Wolfgang	A 74		Hydrodynamic analysis of proteins and protein complexes by analytical ultracentrifugation	1,0	10-11 Oct 2011
Fischle, Wolfgang	Winter, Stefan / Kost, Nils	A 75	*	Chromatin Immunoprecipitation (CHiP)	1,0	6-8 Feb 2012
Görlich, Dirk	Frey, Steffen	A 80	*	Advanced bacterial protein expression and purification	1,0	13-14 Oct 2011
Rodnina, Marina	Milon, Pohl	A 81	*	Introduction to transient kinetic methods	1,0	31 Oct - 1 Nov 2011
Lührmann, Reinhard	Hartmuth, Klaus	A 82	*	Affinity purification methods for the isolation of large heterogeneous macromolecular assemblies	1,0	6-8 Dec 2011

Rehling, Peter	Deckers, Markus	A 92	*	Subcellular fractionation	0,5	between 7 and 11 Nov 2011
Lührmann, Reinhard	Hartmuth, Klaus	A 93	*	The application of RNA structure determination methodology to the analysis of RNA-protein interactions in RNP complexes	1,5	11-13 Jan 2012

Molecular Biology & Genetics

Dobbelstein, Matthias	Schulz, Ramona / Schmidt, Franziska	A 10	*	Assessing promoter activity by luciferase assays	1,0	Oct 2011
Jakobs, Stefan	Grotjohann, Tim / Brakemann, Tanja	A 37	*	PCR based mutagenesis strategies to evolve (photoswitchable) fluorescent proteins	1,0	11-12 Oct 2011
Walter, Lutz	Gruber, Jens	A 68	*	Mechanisms of RNA silencing	1,0	Oct 2011
Görlich, Dirk	Frey, Steffen	A 77	*	PCR: self-made enzymes, helpful additives and insights into the reactions	0,5	11 Oct 2011
Fischer, Andrè	Stilling, Roman / Agbemenyah, Hope / Bahari Javan, Sanaz	A 84	*	Chromatin-immunoprecipitation and epigenomic gene-profiling in the adult brain	1,0	21-23 Sep 2011
Stoykova, Anastassia	Tuoc, Tran Cong	A 88		Analysis of protein-DNA interaction *in vitro* by electrophoretic mobility shift assay (EMSA)	1,0	12-14 Dec 2011
Brenig, Bertram	Schütz, Ekkehard	A 113		NGS and HTP SNP typing	1,0	Nov/Dec 2011

Cell Biology & Microbiology, Imaging

Cordes, Volker	Cordes, Volker	A 09		Preparation of *Xenopus laevis* nuclear envelopes and their analysis by field emission scanning electron microscopy	1,0	26-28 Oct 2011
Großhans, Jörg	Kanesaki, Takuma	A 23		Multi-color time-lapse imaging of cells and embryos	1,0	29-30 Sep 2011
Kehlenbach, Ralph	Kehlenbach, Ralph	A 39	*	Analysis of nucleocytoplasmic transport by flow cytometry	0.5	Jan 2012
Nave, Klaus-Armin	Möbius, Wiebke	A 44	*	Subcellular localization of proteins by immunoelectron microscopy of cryosections	1,0	7-8 Nov 2011
Olympus / Bodenschatz	Schmidt, Helge	A 46/I	*	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	1,0	Feb/Mar 2012
Olympus / Bodenschatz	Schmidt, Helge	A 46/II	*	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	1,0	Feb/Mar 2012
Simons, Mikael	Mitkovski, Miso	A 59		GFP proteins and their application (FRAP, FRET, photo activation)	1,0	13-14 Oct 2011

Developmental Biology, Anatomy & Histology

Eichele, Gregor	Miletic, Helena	A 13	*	Mouse histology & *in situ* expression analyses	1,0	7-8 Nov 2011
Oster, Henrik	Oster, Henrik	A 47	*	Real-time luminescence recording and imaging	1,0	7 & 11 Nov 2011
Pieler, Tomas	Henningfeld, Kristine	A 51		Gene regulation in *Xenopus*	1,0	6-8 Nov 2011
Stadelmann-Nessler, Christine	Stadelmann-Nessler, Christine / Reichl, Jasmin	A 60	*	Non-radioactive *in situ* hybridization	1,0	16-18 Jan 2012
Wimmer, Ernst / Bucher, Gregor	Wimmer, Ernst / Bucher, Gregor	A 108	*	Homologs and Paralogs – how they evolve and how to distinguish them	0,5	9 Sep 2011

Vertebrate Animal Models

Bähr, Mathias	Lingor, Paul	A 01	*	Introduction to animal experiments	0,5	8 Nov 2011
Bayer, Thomas A.	Wirths, Oliver	A 02	*	Alzheimer's disease: Behavioural and neuropathological analysis of transgenic mouse models	1,0	21-22 Nov 2011
Brembeck, Felix	Thiede, Nadine	A 05	*	Basic anatomy of genetically engineered mouse models	0.5	Nov 11
Schraepler, Anke	Schraepler, Anke	A 101		Introduction to laboratory animal science	1,5	Feb 2012
Brembeck, Felix	Nadine Thiede	A 107	*	Tissue processing and immunohistochemistry on tissue sections of genetically engineered mouse models	1,0	Nov 11

Molecular & Cellular Neuroscience, Electrophysiology

Nave, Klaus-Armin	Roßner, Moritz	A 45	*	Microdissection combined with RNA analysis in the brain	1,0	22-24 Feb 2012
Stühmer, Walter	Pardo, Luis	A 63	*	Patch clamp	1,0	23-25 Jan 2012
Fiala, Andrè / Göpfert, Martin	Fiala, Andrè / Göpfert, Martin	A 83	*	*Drosophila* neurogenetics	1,0	5-7 Sep 2011
Rizzoli, Silvio	Kamin, Dirk / Denker, Annette	A 89	*	High resolution microscopy in synapses	1,0	part of E 01
Rhee, JeongSeop	Rhee, JeongSeop	A 96	*	Nerve cell culture and patch-clamp recordings from nerve cells	1,0	26-27 Sep 2011

Theoretical, Systems & Behavioral Neuroscience

Ehrenreich, Hannelore	Begemann, Martin / Bartels, Claudia	A 12	`	Translational Neuroscience: (A/Jun) Schizophrenia, **(B/Nov) Multiple Sclerosis**	2.0 / module*	4-6 Nov 2011
Fischer, Julia	T Price, P Maciej	A 17	*	Introduction to bioacoustic field methods: from recording to statistics	1,0	26-28 Oct 2011
Geisel, Theo / Timme, Marc / Wolf, Fred / Battaglia, Demian	Geisel, Theo / Timme, Marc / Wolf, Fred / Battaglia, Demian	A 21		Theoretical and Computational Neuroscience: Collective Dynamics Biological Neural Networks I	1,0	WS 2011/12
Moser, Tobias / Treue, Stefan / Göpfert, Martin / Fiala, André	Moser, Tobias / Treue, Stefan / Göpfert, Martin / Fiala, André	A 42		Fundamental principles of sensory processing	1,0	21-22 Sep 2011
Antal, Andrea	Paulus, Walter	A 48		Transcranial magnetic- and electrical stimulation	1,0	21-23 Feb 2012
Gail, Alexander	Gail, Alexander	A 73	*	Introduction to Matlab in Systems Neuroscience	1,0	21/28 Oct & 4 Nov 2011

Structural Biology

Bennati, Marina	Türke, Maria Teresa / Tkach, Igor / Argirevic, Tomislav	A 03	*	EPR-Spectroscopy	1,5	26-28 Sep 2011
Grüne, Tim	Grüne, Tim	A 57		Macromolecular crystal structure determination	2,0	26-30 Sep 2011
Stark, Holger	Platzmann, Florian	A 61	*	3D structure determination of macromolecular complexes by single particle cryo-EM	1,0	between 7 and 11 Nov 2011
Pena, Vlad	Schmitzova, Jana / Steuerwald, Ulrich / De, Inessa / de Moura, Tales / Wawrzinek, Jürgen	A 102	*	Crystallization of biological macromolecules	1,0	23-24 Jan 2012

Biophysics, Bioinformatics and Statistics

Grubmüller, Helmut / Schmidt, Christoph F.	Grubmüller, Helmut / Schmidt, Christoph F.	A 25	*	Current Topics in Biophysics – Lecture Series	1,0	WS 2011/12, Fri
Grubmüller, Helmut / de Groot, Bert / Groenhof, Gerrit	Grubmüller, Helmut / de Groot, Bert / Groenhof, Gerrit	A 26		Computational Biophysics I	1,5	WS 2011/12, Mon
Vink, Richard	Vink, Richard	A 43		Computer simulation methods in statistical physics	1,0	WS 2011/12, Thu
Steinem, Claudia / Janshoff, Andreas	Mey, Ingo / Saßen, Christoph	A 62	*	Scanning Ion Conductance Microscopy, a versatile tool to study surfaces and surface properties	1,0	10-11 Oct 2011
Walter, Lutz	Brameier, Markus	A 67	*	Introduction to Bioinformatics Methods	1,0	Oct 2011

Steinem, Claudia / Janshoff, Andreas	Behn, Daniela	A 72	*	Using biosensors to study analyte-ligand interactions: basic principles and applications	1,0	19-20 Sep 2011
Hoff, Katharina	Hoff, Katharina	A 94	*	Introductory biostatistics with R	1,0	16-18 Feb 2012
Lapp, Tobias / Boekhoff, Sven / Eric Stellamanns	Lapp, Tobias / Boekhoff, Sven / Eric Stellamanns	A 97	*	Image Processing with ImageJ and MATLAB / Octave	0,5	15 Sep 2011
Mitkovski, Mišo	Mitkovski, Mišo	A 98	*	Introduction to image processing in biology with ImageJ	0,5	10-11 Nov 2011
Friede, Tim	Konietsche, Frank / Lange, Katharina	A 100	*	Basic statistics for graduate students in the life sciences	1,0	10/12/13/14 Oct 2011
Göpfert, Martin	Ovezmyradov, Guvanch	A 112		MySQL for biologists	1,0	17-18 Oct 2011

Extended Methods Courses

Hell, Stephan / Egner, Alexander	Advanced Light Microscopy	E 01		Advanced Light Microscopy	3,0	25-30 Sep 2011

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340032	**Credits:**	0.5	**Date:**	8 November 2011

Title of Course: (Course ID):	Introduction to animal experiments (A 01)
Group Leader / Supervisor(s):	Paul Lingor, Mathias Bähr
Place:	S2 Lab, Waldweg 33, Basement

Participants:	min: 2	max: 6

Duration:	1 day	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

Animal models are widely used in the life sciences, medical research and especially neuroscience. They are used to study the etiology of various diseases as well as experimental treatment methods. In this course we will give an overview on what is considered an animal experiment and why animal experiments are necessary. We will discuss the strict prerequisites preceeding experiments on life animals and study the possibilities to reduce harm to research animals.

In the second part, students will have the possibility to follow a surgical intervention on animals within an ongoing research project depending on the current research activity in our lab. Special emphasis will be given to proper anaesthesia of the animal. We will demonstrate interventions on the optic nerve in Wistar rats, such as axotomy, optic nerve crush or intravitreal injections. Students will be able to watch brain injections according to stereotactic coordinates. We will also demonstrate behavioral tests, such as the rotarod examination.

Contact 1:	PD Dr. Paul Lingor	plingor@gwdg.de	Tel. 0551-39 4927
Contact 2:			

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340034	**Credits:**	1.0	**Date:**	21-22 Nov 2011

Title of Course (Course ID):	Alzheimer's disease: Behavioural and neuropathological analysis of transgenic mouse models (A 02)
Group Leader / Supervisor(s):	Thomas Bayer, Oliver Wirths
Place:	Molecular Psychiatry Lab, Dept. of Psychiatry, von-Siebold-Str. 5, Basement

Participants:	min: 2	max: 4		
Duration:	2 days	**Time on Day 1:**	09:30 h	
Preparatory Meeting:	No			

Course 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 1:	Dr. Oliver Wirths	owirths@gwdg.de	Tel. 0551-39 10290
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340055	**Credits:**	1.5	**Date:**	26-28 Sep 2011

Title of Course (Course ID):	EPR-Spectroscopy (A 03)
Group Leader / Supervisor(s):	Marina Bennati, Maria Teresa Türke, Igor Tkach, Tomislav Argirevic
Place:	Max-Planck-Institut für biophysikalische Chemie, AG Elektronenspinresonanz-Spektroskopie, Am Fassberg 11

Participants:	min: 2	max: 6

Duration:	3 d	**Time on Day 1:**	9:00 h

Preparatory Meeting:	No

Course description:

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

Contact 1:	Dr. Igor Tkach	igor.tkach@mpibpc.mpg.de	Tel. 0551 201-1004
Contact 2:	Maria Teresa Türke	mtuerke@gwdg.de	Tel. 0551 201-1380

Comments:	Basic knowledge in spectroscopy is required

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340035	**Credits:**	0.5	**Date:**	Nov 2011

Title of Course (Course ID):	Basic anatomy of genetically engineered mouse models (A 05)
Group Leader / Supervisor(s):	Felix H. Brembeck, Nadine Thiede
Place:	UMG, University Hospital, Research Laboratory “Tumor Biology and Signal Transduction”, Dep. Hematology/Oncology, Room 1D4 681

Participants:	min: 2	max: 6			
Duration:	1 day	**Time on Day 1:**	10:00 h		
Preparatory Meeting:	No				

Course 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 early organ development and the development of intestinal and breast cancer.

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.

Contact 1:	Prof. Dr. Felix H. Brembeck	brembeck@med.uni-goettingen.de	Tel. 0551-39 10568
Contact 2:	Nadine Thiede	thiede@med.uni-goettingen.de	Tel. 0551-39 10568

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340110	**Credits:**	1.0	**Date:**	26- 28 Oct 2011

Title of Course: (Course ID): Preparation of *Xenopus laevis* nuclear envelopes and their analysis by field emission scanning electron microscopy (A09)

Group Leader / Supervisor(s): Volker Cordes

Place: MPI for Biophysical Chemistry, Department of Cellular Logistics, T3, 3rd floor

Participants: min: 2 max: 3

Duration: 3 days **Time on Day 1:** 09:30 h

Preparatory Meeting: No

Course 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 1:	PD Dr. Volker Cordes	vcordes@gwdg.de	Tel. 0551-201 2404
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340003	**Credits:**	1.0	**Date:**	October 2011

Title of Course: (Course ID):	Assessing promoter activity by luciferase assays (A 10)
Group Leader / Supervisor(s):	Matthias Dobbelstein, Ramona Schulz, Franziska Schmidt
Place:	Department of Molecular Oncology, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

Participants:	min: 3	max: 6

Duration:	2 days	**Time on Day 1:**	10:00 h

Preparatory Meeting:	No

Course 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.

Contact 1:	Ramona Schulz	rschulz1@gwdg.de	Tel. 0551-39 3574
Contact 2:	Franziska Schmidt	fschmid1@gwdg.de	Tel. 0551-39 13841

Comments:	2 days, each time starting in the morning

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340042	**Credits:**	2.0 / module*	**Date:**	4-6 Nov 2011

Title of Course (Course ID): Translational Neuroscience: **Block B - Multiple Sclerosis** (A 12)

Group Leader / Supervisor(s): Hannelore Ehrenreich, Martin Begemann, Claudia Bartels

Place: MPI for Experimental Medicine, Division of Clinical Neuroscience

Participants: min: 6 max: 18

Duration: 2 x 3 d* **Time on Day 1:** 08:00 h

Preparatory Meeting: No

Course description:

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 2 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.

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), behavioral battery focusing 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.

Content 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.

Contact: Prof. Dr. Dr. H. Ehrenreich | timner@em.mpg.de | Tel. 0551-3899 615

Comments:

* 2 blocks of 3 days each in June and November, Friday through Sunday
Written test (multiple choice) at the end of each block. The lecture series comprises also *practical parts* (short lab visits), e.g. psychopathology rating, neuropsychology testing, imaging, diagnostics, cell culture work, behavioral studies etc.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340029	**Credits:**	1.0	**Date:**	7-8 November 2011

Title of Course: (Course ID):	Mouse histology and in situ expression analyses (A 13)
Group Leader / Supervisor(s):	Gregor Eichele, Helena Miletic
Place:	MPI for Biophysical Chemistry, Department of Genes & Behavior, Am Fassberg 11, Tower 5, 2nd floor

Participants:	min: 2	max: 6

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

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

Contact 1:	Helena Miletic	helena.miletic@mpibpc.mpg.de	Tel. 0551-201 2700
Contact 2:	Christine van den Bogaart	cbogaar@gwdg.de	Tel. 0551-201 2700

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340045	**Credits:**	1.0	**Date**	End of Feb 2012

Title of Course (Course ID):	Introduction to lipid analysis (A 16)
Group Leader / Supervisor(s):	Ivo Feußner
Place:	Dept. of Plant Biochemistry Lab 0.201, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

Participants:	min: 4	max: 8		
Duration:	3 days	**Time on Day 1:**	09:00 h	
Preparatory Meeting:	No			

Course 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 1:	Dr. Steffen Burkhardt	gpmolbio@gwdg.de	Tel. 0551-39 12110
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340089	**Credits:**	1.0	**Date:**	26-28 Oct 2011

Title of Course: (Course ID):	Introduction to bioacoustic field methods: from recording to statistics (A 17)
Group Leader / Supervisor(s):	Julia Fischer, Tabitha Price, Peter Maciej
Place:	German Primate Center, Kellnerweg 4, Seminar room C 1.04

Participants:	min: 2	max: 8

Duration:	2.5 d	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

This short methods course will provide a brief introduction into the basic steps of bioacoustic research.

We will begin with an introduction into the physics of sound, the mechanisms of sound production, and acoustic analyses. A mini-project will then be conducted with acoustic recordings in the field, selection of sounds for further analyses, and an overview of standard measures used in the analyses of animal and human sounds.

Research carried out within the German Primate Center will be presented to demonstrate the practical application of acoustic analyses including important statistical tools to answer relevant questions in the field of animal and human communication.

The course will last 2.5 days and will be held at the German Primate Center.

Contact 1:	Tabitha Price	tprice@dpz.eu	Tel. 0551-3851 475
Contact 2:	Peter Maciej	Peter_Maciej@gmx.de	Tel. 0551-3851 475

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340053	**Credits:**	2.0	**Date:**	WS 2011/12

Title of Course: (Course ID): Theoretical and Computational Neuroscience: Collective Dynamics Biological Neural Networks I (A 21)

Group Leader / Supervisor(s): Theo Geisel, Marc Timme, Fred Wolf, Demian Battaglia

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

Participants: min: 5 max:

Duration: 2 SWS **Time on Day 1:** 14:15 h

Preparatory Meeting: No

Course 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.

Contact 1:	Dr. Marc Timme	timme@nld.ds.mpg.de	Tel. 0551-5176 440
Contact 2:	Dr. Demian Battaglia	demian@nld.ds.mpg.de	

Comments: Course unit I: Winter Semester / Fri, 14:00-16:00 (weekly). We recommend starting in the winter semester, but a start in a summer term (with course A 22) is possible as well.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340050	**Credits:**	1.0	**Date:**	29-30 Sep 2011

Title of Course: (Course ID):	Multi-color time-lapse imaging of cells and embryos (A23)
Group Leader / Supervisor(s):	Jörg Großhans, Takuma Kanesaki
Place:	Dept. Developmental Biochemistry, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

Participants:	min: 2	max: 4		
Duration:	2 days	**Time on Day 1:**	10:00 h	
Preparatory Meeting:	No			

Course description:

The course will demonstrate the use of fluorescent proteins (GFP and variants) in Developmental cell biology. We will perform time-lapse recordings of cultured cells and Drosophila embryos that express fusion proteins with GFP, RFP or variants on a confocal microscope with spinning disc optics. Structures and processes to be analyzed include mitosis, nuclear envelope, microtubules, recycling endosome. On the second day students may bring and record their own samples.

Contact 1:	Prof. Jörg Großhans	joerg.grosshans@medizin.uni-goettingen.de	Tel. 0551-39 8242

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340121	**Credits:**	1.0	**Date:**	WS 2011/12, Fridays

Title of Course (Course ID):	Current Topics in Biophysics – Lecture Series (A25)
Group Leader / Supervisor(s):	Helmut Grubmüller, Christoph Schmidt
Place:	Seminar Room – Department of Prof. Schmidt, Section F, 2nd floor, room F02.125, Neue Physik, Friedrich-Hund-Platz 1

Participants:	min: 5	max: -			
Duration:	WS 11/12	**Time on Day 1:**	09:15 h		
Preparatory Meeting:	No				

Course 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 1:	Antje Erdmann	imprs-pbcs@gwdg.de	Tel. 0551-201 2322
Contact 2:			

Comments:	2 SWS

GGNB Short Methods Courses: Sep 2011 – Feb 2012

GGNB
Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340122	**Credits:**	1.5	**Date:**	WS 11/12, Mondays

Title of Course (Course ID):	Computational Biophysics I (A 26)
Group Leader / Supervisor(s):	Helmut Grubmüller, Bert de Groot, Gerrit Groenhof
Place:	Physics Faculty HS3, A0.106; Physics Faculty – CIP Pool1, CO.110

Participants:	min: 3	max: -			
Duration:	WS 2011/12	**Time on Day 1:**	16:00-18.00h		
Preparatory Meeting:	No				

Course description:

Combined lecture and hands-on computer tutorial. Theory and computer simulations of biomolecular systems, particularly proteins. Basic knowledge in Physics preferred.

No cell could live without the highly specialized “nano maschines” – the proteins. Proteins enable virtually all tasks in our bodies, e.g. photosynthesis, motion, signal transmission and information processing, transport, sensor system, and detection. The perfection of proteins had already been highly developed two billion years ago and often surpasses the functions of organs. Computer simulations of the motion of any single atom in the proteins help us to understand how those nano marvels function. The course focuses on the basics of computational biophysics and deals with questions like “How can the particle dynamics of thousands of atoms be described precisely?” or “How does a sequence alignment algorithm function?”. Moreover, the lecture shows (by means of examples) how computers can be used in the modern biophysics, e.g. to simulate the dynamics of biological nano maschines or to calculate or refine a protein structure. The aim of the lecture is to develop a physical understanding of those “nano maschines” on an atomistic scale.

"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 1:	Dr. Bert de Groot	bgroot@gwdg.de	Tel. 0551 – 201 2308
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340005	**Credits:**	1.0	**Date:**	23-24 Nov 2011

Title of Course: (Course ID):	Chemical synthesis and enzymatic ligation of RNA and DNA oligonucleotides (A32)
Group Leader / Supervisor(s):	Claudia Höbartner
Place:	MPI for Biophysical Chemistry, AG Nucleic Acid Chemistry, T2, SOG

Participants:	min: 2	max: 4

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course 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 1:	Dr. Claudia Höbartner	Claudia.hoebartner@mpibpc.mpg.de	Tel. 0551-201 1685
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340046	**Credits:**	1.0	**Date:**	17-18 Oct 2011

Title of Course: (Course ID):	Reconstitution of neuronal exocytosis (A 33)
Group Leader / Supervisor(s):	Reinhard Jahn, Geert van den Bogaart, Yongsoo Park
Place:	MPI for Biophysical Chemistry, Department of Neurobiology, T6, 1st Floor

Participants:	min: 2	max: 6

Duration:	2 days	**Time on Day 1:**	09:30 h

Preparatory Meeting:	No

Course 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 1:	Dr. Geert van den Bogaart	Geert-van-den.Bogaart@mpibpc.mpg.de	Tel. 0551-201 1670
Contact 2:	Dr. Yongsoo Park	yongsoo.park@mpibpc.mpg.de	

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

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Göttingen Graduate School for
Neurosciences and Molecular Biosciences

UniVz No.:	340015	**Credits:**	1.0	**Date:**	November 2011

Title of Course: (Course ID):	BiFC (bimolecular fluorescence complementation) in yeast (A 34)
Group Leader / Supervisor(s):	Hans Dieter Schmitt, Saskia Schröter
Place:	MPI for Biophysical Chemistry, Department of Neurobiology, T6, 1st Floor

Participants:	min: 2	max: 4

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	Yes*

Course description:

Bimolecular fluorescence complementation (BiFC) is used to visualize protein-protein interactions *in vivo,* using protein tags on the putative interaction partners. For this, the two fragments of a "split up" fluorescent protein (in our case YFP) are introduced at N- or C-terminus of the proteins of interest. These fragments do not associate unless the proteins carrying the tag bind each other. Fluorescence is only emitted from the reconstituted YFP, not from its fragments.
This BiFC technique allows visualization of transient interactions since the assembly of GFP from its fragments is very likely irreversible. However, this may cause artefacts, as BiFC actually represents a "YFP fragment assembly trap". In fact, some BiFC combinations have negative effects on growth probably due to this phenomenon.
The model organism used in this course is baker's yeast *S. cerevisiae*. In this organism, homologous recombination works with high fidelity, enabling the introduction of BiFC tags directly at the chromosomal gene site, thus keeping the cells as close as possible to wildtype behavior. Also, crossing of haploid strains with one BiFC tag each allow for easy and effective combination of two BiFC-tagged proteins in new strains.

Our group studies the interaction between vesicle coats and tethering complexes at the ER in yeast. In the course we will tag coat protein genes (involving PCR and transformation of cells), evaluate produced BiFC signals, and examine some examples where the BiFC signal correlates with effect on growth and viability.

Recommended reading:
Zink S, Wenzel D, Wurm C. and Schmitt HD. (2009). A link between ER tethering and COP-I vesicle uncoating. **Dev. Cell** 17:403-416.

Contact 1:	Dr. Hans-Dieter Schmitt	hschmit@gwdg.de	Tel. 0551-201 1652
Contact 2:	Saskia Schröter	sschroe4@gwdg.de	Tel. 0551-201 1714

Comments:	*Preparatory meeting: approx. one week before the course.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340006	**Credits:**	1.0	**Date:**	12-14 Oct 2011

Title of Course (Course ID):	Co-immunoprecipitation as a technique to study protein-protein interactions (A 35)
Group Leader / Supervisor(s):	Reinhard Jahn, John Chua, Beyenech Binotti
Place:	MPI for Biophysical Chemistry, Department of Neurobiology, T6, 1st Floor

Participants:	min: 2	max: 4		
Duration:	2 days	**Time on Day 1:**	09:00 h	
Preparatory Meeting:	Yes			

Course description:

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.

Contact 1:	Dr. John Chua	jchua@gwdg.de	Tel. 0551-201 1663
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340004	**Credits:**	1.0	**Date:**	13-14 Oct 2011

Title of Course (Course ID):	Protein purification and characterization (A 36)
Group Leader / Supervisor(s):	Reinhard Jahn, Karin Kühnel
Place:	MPI for Biophysical Chemistry, Department of Neurobiology, Kühnel Group, T6, 1st Floor

Participants:	min: 2	max: 4

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

This course is meant for students with little or no experiences in protein purification 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 methods for determining protein concentrations, the dialysis of proteins and how to concentrate proteins through ultrafiltration.

Contact 1:	Dr. Karin Kühnel	kkuehne@gwdg.de	Tel. 0551-201 1795
Contact 2:			

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340026	**Credits:**	1.0	**Date:**	11-12 Oct 2011

Title of Course (Course ID):	PCR based mutagenesis strategies to evolve (photoswitchable) fluorescent proteins (A 37)
Group Leader / Supervisor(s):	Stefan Jakobs, Tim Grotjohann, Tanja Brakemann
Place:	MPI for Biophysical Chemistry, Department of NanoBiophotonics, T2, 2nd floor

Participants:	min: 2	max: 4			
Duration:	2 days	**Time on Day 1:**	09:15 h		
Preparatory Meeting:	No				

Course 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 1:	Prof. Stefan Jakobs	sjakobs@gwdg.de	Tel. 0551-201 2531
Contact 2:	Tim Grotjohann	tgrotjo@gwdg.de	Tel. 0551-201 2510

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVZ No:	340081	**Credits:**	0.5	**Date:**	Jan 2012

Title of Course: (Course ID):	Analysis of nucleocytoplasmic transport by flow cytometry (A 39)
Group Leader / Supervisor(s):	Ralph Kehlenbach
Place:	Dept. of Biochemistry I, Humboldtallee 23, 37073 Göttingen

Participants:	min: 2	max: 4		
Duration:	1 d	**Time on Day 1:**	09:00 h	
Preparatory Meeting:	No			

Course description:

This 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 1:	Dr. Ralph Kehlenbach	rkehlen@gwdg.de	Tel. 0551-39 5950
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340124	**Credits:**	0.5	**Date:**	21-22 Sep 2011

Title of Course (Course ID):	Fundamental principles of sensory processing (A 42)
Group Leader / Supervisor(s):	Tobias Moser, Stefan Treue, Martin Göpfert, André Fiala
Place:	tba

Participants:	min: -	max: 50

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

Symposium and methods workshop with prominent speakers in sensory neuroscience.

Topics:

- Transduction and amplification of mechanical stimuli (Martin Göpfert, Göttingen)
- Phototransduction (Gary Matthews, Stony Brook, NY)
- Chemotransduction (Benjamin U. Kaupp, Bonn)
- Sensory encoding at ribbon synapses (Tobias Moser, Göttingen)
- Central auditory processing (Georg Klump, Oldenburg)
- Central visual processing (David Fitzpatrick, Max Planck Florida Institute, Jupiter, FL, USA)

See http://www.rss2011.uni-goettingen.de for further details regarding the preceding “Ribbon Synapses Symposium 2011”

Contact 1:	Prof. Tobias Moser	tmoser@gwdg.de	Tel. 0551-39 8968
Contact 2:			

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340123	**Credits:**	1.0	**Date:**	WS 11/12, Thursdays 10-12 h

Title of Course: (Course ID): Computer simulation methods in statistical physics (A 43)

Group Leader / Supervisor(s): Richard Vink

Place: SR4 (A4.101)

Participants: min: 8 max: 30

Duration: 2 SWS (12 d) **Time on Day 1:** 10.00 c.t.

Preparatory Meeting: no

Course 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 1:	Dr. Richard Vink	Richard.Vink@theorie.physik.uni-goettingen.de	Tel. 0551-39 7684

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340025	**Credits:**	1.0	**Date:**	7-8 Nov 2011

Title of Course: (Course ID):	Subcellular localization of proteins by immunoelectron microscopy of cryosections (A44)
Group Leader / Supervisor(s):	Klaus-Armin Nave, Wiebke Möbius
Place:	MPI for Experimental Medicine, Dept. of Neurogenetics

Participants:	min: 2	max: 3

Duration:	2 days	**Time on Day 1:**	09:30 h

Preparatory Meeting:	No

Course 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 1:	Dr. Wiebke Möbius	moebius@em.mpg.de	Tel. 0551-3899 736
Contact 2:			

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340037	**Credits:**	1.0	**Date:**	22-24 Feb 2012

Title of Course: (Course ID):	Microdissection combined with RNA analysis in the brain (A 45)
Group Leader / Supervisor(s):	Moritz Rossner
Place:	MPI for Experimental Medicine, Dept. of Neurogenetics, Hermann-Rein-Str. 3

Participants:	min: 2	max: 3
Duration:	3 days	**Time on Day 1:** 11:00 h
Preparatory Meeting:	No	

Course 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 1:	Dr. Moritz Rossner	rossner@em.mpg.de	Tel. 0551-3899 781
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

GGNB
Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340027	**Credits:**	1.0	**Date:**	Feb / Mar 2012

Title of Course (Course ID):	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 (A 46)
Group Leader / Supervisor(s):	Olympus (Bodenschatz lab)
Place:	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 for Biophysical Chemistry
Participants:	min: 3 / max: 10
Duration:	2 days
Time on Day 1:	09:00 h
Preparatory Meeting:	No

Course 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)

Exact dates tba

Contact 1:	Dr. Helge Schmidt	helge.schmidt@olympus.de	Tel. 0160-7178732
Contact 2:	Barbara Kasemann	barbara.kasemann@ds.mpg.de	Tel. 0551-5176 310

Comments:	The course will be offered to two groups of up to 5 participants per group.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340111	**Credits:**	1.0	**Date:**	7 & 11 Nov 2011

Title of Course (Course ID):	Real-time luminescence recording and imaging (A 47)
Group Leader / Supervisor(s):	Henrik Oster
Place:	MPI for Biophysical Chemistry, Circadian Rhythms Group, Department of Genes & Behavior, Am Fassberg 11, Tower 5, 2nd floor

Participants:	min: 2	max: 4		
Duration:	2 days*	**Time on Day 1:**	10:00 h	
Preparatory Meeting:	No			

Course description:

The transcriptional events that organize 24hr ("circadian") rhythms of physiology and behavior 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 cultures from liver slices of PER2::LUC transgenic mice and of different reporter cell lines. We will monitor both circadian rhythms and acutely induced expression of luciferase using PMT and luciferase imaging techniques.

On the second day luminescence traces and images will be quantified and compared between different setups. Applied techniques will include: tissue isolation, preparation of slices and culturing, cell culture synchronisation, transfection, luminescence recordings and imaging.

Contact 1:	Dr. Henrik Oster	henrik.oster@mpibpc.mpg.de	Tel. 0551-201 2738
Contact 2:			

Comments: * 2 separate dates with three days in between

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340056	**Credits:**	1.0	**Date:**	21-23 Feb 2012

Title of Course: (Course ID):	Transcranial magnetic- and electrical stimulation (A 48)
Group Leader / Supervisor(s):	Andrea Antal, Walter Paulus
Place:	Universitätsklinikum Göttingen, Robert-Koch Straße 40, Hörsaal 542

Participants:	min: 5	max: 50		
Duration:	3 days	**Time on Day 1:**	10:00 h	
Preparatory Meeting:	No			

Course description:

The course is aimed at introducing the theoretical background and practical applications of TMS and tDCS, tACS, tRNS 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 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).

Contact 1:	Prof. Dr. Andrea Antal	aantal@gwdg.de	Tel. 0551-39 8461
Contact 2:			

Comments:	Registration fee waived for GGNB students

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340120	**Credits:**	1.0	**Date:**	6-8 Nov 2011

Title of Course: (Course ID):	Microinjection in *Xenopus* embryos (A51)
Group Leader / Supervisor(s):	Tomas Pieler, Kristine Henningfeld
Place:	Dept. of Developmental Biochemistry, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

Participants:	min: 1	max: 4
Duration:	2.5 d	**Time on Day 1:** 09:00 h
Preparatory Meeting:	No	

Course 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 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 1:	Dr. Kristine Henningfeld	khennin1@gwdg.de	Tel. 0551-39 5970
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340057	**Credits:**	2.0	**Date:**	26-30 Sep 2011

Title of Course: (Course ID):	Macromolecular crystal structure determination (A 57)
Group Leader / Supervisor(s):	Tim Grüne
Place:	Hodgkin seminar room (MN26, Tammannstr. 4) Practicals: Computer room of AK Sheldrick (308)

Participants:	min: 5	max:30		
Duration:	4 days lecture 5 days practical	**Time on Day 1:**	9:00 h	
Preparatory Meeting:	no			

Course description:

Content of Course:
Symmetry and space groups. X-ray diffraction by single crystals. Solution and refinement of macromolecular structures. Crystallographic databases. Practical aspects, computer programs and synchrotron applications.

Recommended literature:
Rupp, Bernhard (2009) Biomolecular Crystallography: Principles, Practice and Application to Structural Biology. Garland Science, Taylor & Francis group, ISBN 978-0-8153-4081-2

Place and Time:
The lecture takes place at the Hodkin Seminar room (MN26) at the inorganic chemistry department.
Lectures are held Monday, Tuesday, Thursday, and Friday, 9-11am.

Practicals:
A one week practical is offered following the lecture with the aspect of better understanding the terms and contents of the lecture by hands-on exercises.

There are 10 students per practical, ideally working in groups of two; depending on demand we can offer up to three weeks, starting the week after the lecture.
Practicals will run from 1pm until 5pm every day.

Contact 1:	Dr. Tim Grüne	tg@shelx.uni-ac.gwdg.de	Tel. 0551-39 22149
Contact 2:			

Comments:
Due to changes in the personnel at the Inorganic Chemistry there is a mild chance of the practicals having to be cancelled, but students will be informed in time.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340114	**Credits:**	1.0	**Date:**	13-14 Oct 2011

Title of Course (Course ID):	GFP proteins and their application (FRAP, FRET, photo activation) (A59)
Group Leader / Supervisor(s):	Mikael Simons, Mišo Mitkovski
Place:	MPI for Experimental Medicine, AG Simons, Hermann Rein Str. 3

Participants:	min: 2	max: 8

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course 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). Image analysis will be performed using open source software.

Contact 1:	Prof. Dr. Mikael Simons	msimons@gwdg.de	Tel. 0551-3899 533
Contact 2:	Dr. Mišo Mitkovski	mitkovski@em.mpg.de	Tel. 0551-3899 620

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340033	**Credits:**	1.0	**Date:**	16-18 Jan 2012

Title of Course (Course ID):	Non-radioactive *in situ* hybridization (A 60)
Group Leader / Supervisor(s):	Christine Stadelmann-Nessler, Jasmin Reichl
Place:	Klinikum, Dept. of Neuropathology, Robert-Koch-Str. 40

Participants:	min: 2	max: 3

Duration:	3 d	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

- Non-radioactive *in situ* hybridization: The students will perform non-radioactive *in situ*-hybridization for myelin proteins on brain sections of mice and rats.
- Immunohistochemistry for light microscopy. The students will perform immunohistochemistry for myelin proteins on brain and spinal cord tissue from mice with experimental autoimmune encephalomyelitis.

Contact 1:	Prof. Dr. C. Stadelmann-Nessler	cstadelmann@med.uni-goettingen.de	Tel. 0551-39 12610
Contact 2:	Jasmin Reichl (née Held)	Jasmin_Held@web.de	Tel. 0551-39-14133

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340060	**Credits:**	1.0	**Date:**	b/w 7 and 11 Nov 2011

Title of Course: (Course ID):	3D structure determination of macromolecular complexes by single particle cryo-EM (A 61)
Group Leader / Supervisor(s):	Holger Stark, Florian Platzmann
Place:	MPI for Biophysical Chemistry, 3D-Cryo Electron Microscopy lab

Participants:	min: 2	max: 2

Duration:	2 days	**Time on Day 1:**	10:00 h

Preparatory Meeting:	No

Course 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 1:	Prof. Holger Stark	holger.stark@mpibpc.mpg.de	Tel. 0551-201 1305
Contact 2:	Florian Platzmann	fplatzm@gwdg.de	Tel. 0551-201 1302

Comments:	The course takes place on two days in the week of 7-11 Nov 2011

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340065	**Credits:**	1.0	**Date:**	10-11 Oct 2011

Title of Course (Course ID):	Scanning Ion Conductance Microscopy, a versatile tool to study surfaces and surface properties(A 62)
Group Leader / Supervisor(s):	Claudia Steinem, Andreas Janshoff / Ingo Mey, Christoph Saßen
Place:	Institut für Organische und Biomolekulare Chemie, Tammannstr. 2

Participants:	min: 2	max: 3
Duration:	2 days	**Time on Day 1:** 09:00 h
Preparatory Meeting:	No	

Course description:

The basic principles of Scanning Ion Conductance Microscopy will be taught. The participants will have the chance to operate the instrument and, if they are interested, image samples they are bringing. In the end the participants will be able to operate a SICM by themselves.

Contact 1:	Ingo Mey	imey@gwdg.de	Tel. 0551-39 3095
Contact 2:	Christoph Saßen	csassen@gwdg.de	Tel: 0551-39 3208

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340040	**Credits:**	1.0	**Date:**	23-25 Jan 2012

Title of Course: (Course ID):	Patch clamp (A 63)
Group Leader / Supervisor(s):	Walter Stühmer, Luis Pardo
Place:	MPI for Experimental Medicine, Molecular Biology of Neuronal Signals, Labs C203/C207

Participants:	min: 2	max: 6
Duration:	2.5 d	**Time on Day 1:** 09:00 h
Preparatory Meeting:	No	

Course description:

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

Contact 1:	Prof. Walter Stühmer	ws@em.mpg.de	Tel. 0551-3899 646
Contact 2:	Dr. Luis Pardo	pardo@em.mpg.de	Tel. 0551-3899 643

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340018	**Credits:**	1.0	**Date:**	28-29 Nov 2011

Title of Course (Course ID):	Principles and methods of protein purification by chromatography (A 64)
Group Leader / Supervisor(s):	Kai Tittmann, Stefan Schneider, Cindy Wechsler
Place:	Ernst-Caspari-Haus / GZMB building, ground floor, Dept. of Bioanalytics

Participants:	min: 4	max: 6	
Duration:	2 days	**Time on Day 1:**	09:00 h
Preparatory Meeting:	No		

Course 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 1:	Prof. Kai Tittmann	ktittma@gwdg.de	Tel. 0551-39 14430
Contact 2:	Dr. Danilo Meyer	dmeyer2@gwdg.de	Tel. 0551-39 14000

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.::	340020	**Credits:**	1.0	**Date:**	18-20 Oct 2011

Title of Course: (Course ID):	Sequence analysis of proteins and their post-translational modifications by MALDI-ToF and electrospray ionization (ESI) mass spectrometry (A 65)
Group Leader / Supervisor(s):	Henning Urlaub, Ilian Atanassov, Romina Hofele, Samir Karaca, Saadia Qamar
Place:	MPI for Biophysical Chemistry, Mass Spectrometry Group

Participants:	min: 2	max: 4			
Duration:	3 d	**Time on Day 1:**	10:00 h		
Preparatory Meeting:	No				

Course 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 PhD students will not obtain any information what kind of protein they have to analyze 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 1:	Dr. Henning Urlaub	henning.urlaub@mpibpc.mpg.de	Tel. 0551-201 1060
Contact 2:	Carla Schmidt	carla.schmidt@mpibpc.mpg.de	Tel. 0551-201 1500

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340011	**Credits:**	1.0	**Date:**	6-7 Oct 2011

Title of Course: (Course ID): Isolation of recombinant proteins by affinity chromatography and binding studies (A 66)

Group Leader / Supervisor(s): Lutz Walter

Place: Dept. of Primate Genetics, German Primate Center (DPZ), Kellnerweg 4

Participants: min: 1 max: 2

Duration: 2 days **Time on Day 1:** 09:00 h

Preparatory Meeting: No

Course 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. Fc-KIR proteins are then multimerised and fluorescently labeled and will be used to test specific interactions with MHC class I molecules by FACS analysis.

Contact 1:	Prof. Dr. Lutz Walter	lwalter@gwdg.de	Tel. 0551-3851 161
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340068	**Credits:**	1.0	**Date:**	Oct 2011

Title of Course (Course ID):	Introduction to Bioinformatics Methods (A 67)
Group Leader / Supervisor(s):	Lutz Walter, Markus Brameier
Place:	Dept. of Primate Genetics, German Primate Center (DPZ), Kellnerweg 4

Participants:	min: 2	max: 4

Duration:	2 days	**Time on Day 1:**	10:00 h

Preparatory Meeting:	No

Course description:

The course is designed for graduate or undergraduate students. The first part (on day 1) will introduce into basic computational methods and databases in bioinformatics with a focus on genome analysis. This will be communicated by practical exercises, besides seminar discussions. In the second part (on day 2) the participants will be introduced into basic script programming (in Perl).

There is no need to bring your own computer. There will be two desktop computers available so that two students each are supposed to share one computer and work together.

Contact 1:	Dr. Markus Brameier	brameier@dpz.gwdg.de	Tel. 0551-3851 481
Contact 2:	Prof. Dr. Lutz Walter	lwalter@gwdg.de	Tel. 0551-3851 161

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340022	**Credits:**	1.0	**Date:**	October 2011

Title of Course (Course ID):	Mechanisms of RNA silencing (A 68)
Group Leader / Supervisor(s):	Lutz Walter, Jens Gruber
Place:	Dept. of Primate Genetics, German Primate Center (DPZ), Kellnerweg 4

Participants:	min: 3	max: 6		
Duration:	2 days	**Time on Day 1:**	09:00 h	
Preparatory Meeting:	No			

Course description:

The course is designed for graduate students and addresses 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 having completed the course the participants should be able to plan and perform simple RNAi experiments, including functional genetics and miRNA analysis

Contact 1:	Dr. Jens Gruber	jgruber@dpz.eu	Tel. 0551-3851 481
Contact 2:	Prof. Dr. Lutz Walter	lwalter@gwdg.de	Tel. 0551-3851 161

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340077	**Credits:**	1.0	**Date:**	1-2 Dec 2011

Title of Course (Course ID):	Thermodynamic characterization of biomolecular interactions by isothermal titration calorimetry (A 71)
Group Leader / Supervisor(s):	Kai Tittmann, Danilo Meyer, Astrid SItte
Place:	Ernst-Caspari-Haus / GZMB building, ground floor, Dept. of Bioanalytics

Participants:	min: 4	max: 6		
Duration:	2 days	**Time on Day 1:**	09:00 h	
Preparatory Meeting:	No			

Course 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 Δ*G* and its individual enthalpic (Δ*H*) and entropic contributions (Δ*S*), the stoichiometry *n* and the heat capacity Δ*c*p.

This 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 iTC200 manufactured by Microcal.

Contact 1:	Prof. Kai Tittmann	ktittma@gwdg.de	Tel. 0551-39 14430
Contact 2:	Dr. Danilo Meyer	dmeyer2@gwdg.de	Tel. 0551-39 14000

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340067	**Credits:**	1.0	**Date:**	19-20 Sep 2011

Title of Course: (Course ID):	Using biosensors to study analyte-ligand interactions: basic principles and applications (A 72)
Group Leader / Supervisor(s):	Claudia Steinem, Andreas Janshoff, Daniela Behn
Place:	Institut für Organische und Biomolekulare Chemie, Tammannstr. 2

Participants:	min: 2	max: 3

Duration:	2 day	**Time on Day 1:**	7:00 h

Preparatory Meeting:	No

Course description:

The principles of the biosensor techniques surface plasmon resonance (SPR) and quartz crystal microbalance (QCM) will be presented. The response that is used in SPR and QCM based biosensors will be experimentally demonstrated with the spreading of lipid vesicles and protein binding on planar surfaces. Also the analysis and interpretation of the biosensor data will be discussed.

Contact 1:	Prof. Claudia Steinem	csteine@gwdg.de	Tel. 0551-39 3294
Contact 2:	Daniela Behn	dbehn@gwdg.de	Tel: 0551-39 3209

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVZ No:	340043	**Credits:**	1.0	**Date:**	21/28 Oct & 4 Nov 2011

Title of Course: (Course ID):	Introduction to Matlab in Systems Neuroscience (A 73)
Group Leader / Supervisor(s):	Dr. Alexander Gail
Place:	Sensorimotor Group, Cognitive Neuroscience Lab, Hans-Adolf-Krebs Weg 7, German Primate Center

Participants:	min: 3	max: 6			
Duration:	3 days	**Time on Day 1:**	09:00 h		
Preparatory Meeting:	No				

Course description:

This course will provide a short introduction to the Matlab programming environment as a versatile tool in system neuroscience research. The course will be held on 3 days in consecutive weeks. You will be first introduced to the basic principles in Matlab programming, as introduced in the tutorial chapter of the course book. Course days will consist of a mixture of tutorial presentations and own practical exercises under supervision. During the exercises the new course material can be explored in small groups of two or three participants and discussed with the supervisor. Practical exercises will include analysis and graphical processing of test data. Exercises are chosen to address typical topics of system neuroscience, e.g. signal detection theory, neural encoding/curve fitting, correlation analysis, and spectral analysis.

Contact 1:	Dr. Alexander Gail	agail@gwdg.de	0551-3851 118
Contact 2:	Beatrix Glaser	bglaser@gwdg.de	0551-3851 118

Comments:	Course book: Matlab for Neuroscientists, by Wallisch et al., Academic Press, 2009 (excerpts available as PDF for course participants)

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340113	**Credits:**	1.0	**Date:**	10-11 Oct 2011

Title of Course (Course ID):	Hydrodynamic analysis of proteins and protein complexes by analytical ultracentrifugation (A 74)
Group Leader / Supervisor(s):	Dr. Wolfgang Fischle
Place:	Max Planck Institute for Biophysical Chemistry Laboratory of Chromatin Biochemistry, Tower IV, 1st floor

Participants:	min: 3	max: 5		
Duration:	2 days	**Time on Day 1:**	09:00 h	
Preparatory Meeting:	No			

Course description:

Target group: Students with general interest in protein characterization and computational analysis.

Outline: During the course, two basic types of experiments will be conducted. First, a protein will be characterized by its sedimentation behavior in a sedimentation velocity experiment. Using state of the art analysis methods the students will determine the molecular weight as well as the shape factors of the protein. In a second experiment, the protein will be centrifuged until it is at equilibrium. From the resulting concentration gradient, the molecular weight will be determined, which is in this case independent on the shape of the protein. By combining these two experiments, the oligomerization state of the protein and the overall shape can be derived. Also, the purity of the protein preparation will be examined. By analyzing mixtures of the protein and a binding partner in the same way, the binding constant of the interaction will be calculated from the sedimentation behavior.

Contact 1:	Wolfgang Fischle	wfischl@gwdg.de	Tel. 0551-201 1340
Contact 2:			

Comments:	If possible, students should bring a windows-based laptop computer

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340044	**Credits:**	1.0	**Date:**	6-8 Feb 2012

Title of Course (Course ID):	Chromatin Immunoprecipitation (CHiP) (A 75)
Group Leader / Supervisor(s):	Dr. Wolfgang Fischle, Dr. Stefan Winter, Nils Kost
Place:	Laboratory of Chromatin Biochemistry, Max PIanck Institute for Biophysical Chemistry, Tower 4, 1st story

Participants:	min: 2	max: 4		
Duration:	2.5 days	**Time on Day 1:**	09:00 h	
Preparatory Meeting:	No			

Course description:

Chromatin immunoprecipitation is a widely used technique to identify the sides of specific histone modifications and/or the association of transcription factors with specific genomic regions. In its basic form (how it is performed in this course) the precise distribution of a histone modification or the position of a protein of interest in context of a known genomic locus can be monitored. The resolution of the method for histone modification ChIP is a single nucleosome (~200bp). The position of a given DNA binding protein can be determined with even higher accuracy.

In this course the phosphorylation status of H3S10 of the HDAC 1 gene promotor region in response to an environmental stimulus will be examined and compared to control cells that lack that stimulus. Goal of this course is the communication of basic cell culture techniques and of the single steps of a regular CHiP experiment. Typical pitfalls that corrupt CHiP experiments will be discussed. After this course each student should be capable of setting up her/his own CHiP experiment. In detail, the students will be shown how to treat eukaryotic cells prior to the preparation of nuclear extract. They will learn how to prepare the nuclear extract in order to perform the chromatin immunoprecipitation. The procedure of protein:DNA immunoprecipitation along with the recovery of the precipitated DNA will be taught. Polymerase Chain Reaction will be used to analyse the purified genomic DNA.

Contact 1:	Dr. Stefan Winter	stefan.winter@mpibpc.mpg.de	Tel. 0551-201 1447
Contact 2:	Nils Kost	nkost@gwdg.de	Tel. 0551-201 1342

Comments: none

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340078	**Credits:**	0.5	**Date:**	11 Oct 2011

Title of Course: (Course ID): PCR: self-made enzymes, helpful additives and insights into the reactions (A 77)

Group Leader / Supervisor(s): Dirk Görlich/ Steffen Frey

Place: MPI for Biophysical Chemistry, Department of Cellular Logistics, T3, 3rd floor

Participants: min: 3 max: 10

Duration: 1 day **Time on Day 1:** 09:00 h

Preparatory Meeting: No

Course description:

Polymerase chain reactions reactions (PCRs) require a thermostable DNA polymerase. In the first part of the course, we will discuss how helper enzymes and low molecular additives can greatly boost the efficiency of the reaction. Also, we will discuss of how to arrive at a PCR reaction with a very low error rate (there is more to say than "use a proof-reading enzyme"!). The second (practical) part provides the opportunity of preparing a high-end PCR enzyme yourself. The preparation utilizes some nice protein purification tricks.

Note: This course is scheduled as an intense, one-day-programme. It assumes that you are already familiar with transforming and culturing *Escherichia coli*. For those, who lack this experience, the course can also be offered as an extended version.

Contact 1:	Prof. Dirk Görlich	goerlich@mpibpc.mpg.de	Tel. 0551-201 2400
Contact 2:	Dr. Steffen Frey	sfrey@gwdg.de	Tel. 0551-201 2460

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340072	**Credits:**	1.0	**Date:**	13–14 Oct 2011

Title of Course: (Course ID): Advanced bacterial protein expression and purification (A80)

Group Leader / Supervisor(s): Dirk Görlich, Steffen Frey

Place: MPI for Biophysical Chemistry, Department of Cellular Logistics, T3, 3rd floor

Participants: min: 2 max: 6

Duration: 2 day **Time on Day 1:** 09:00 h

Preparatory Meeting: No

Course description:

Recombinant protein expression in *Escherichia coli* is a key technology for biochemistry and structural biology. Expression of eukaryotic proteins, however, often results in low yield and poor solubility. We will discuss strategies, such as codon optimization, usage of special *E.coli* strains and growth conditions and the use of tags to amend such problem.
In the practical part, we will purify a target protein via IMAC, gel filtration and ion-exchange chromatography. The course will also provide a hands-on experience for the use of cleavable affinity tags.

Note: This course is scheduled as an intense, two-day-program. It assumes that you are already familiar with transforming and culturing *Escherichia coli*. For those, who lack this experience, the course can also be offered as an extended version.

Contact 1:	Prof. Dirk Görlich	goerlich@mpibpc.mpg.de	Tel. 0551-201 2400
Contact 2:	Dr. Steffen Frey	sfrey@gwdg.de	Tel. 0551-201 2460

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340010	**Credits:**	1.0	**Date:**	31 Oct – 1 Nov 2011

Title of Course (Course ID):	Introduction to transient kinetic methods (A 81)
Group Leader / Supervisor(s):	Marina Rodnina / Pohl Milon
Place:	Max Planck Institute for Biophysical Chemistry, Department of Physical Biochemistry, Am Fassberg 11, Tower 4, 2.OG

Participants:	min: 2	max: 4

Duration:	2 days	**Time on Day 1:**	09:30 h

Preparatory Meeting: None

Course description:

Biological events are rapid and often take place within msec-sec time range. These processes can be investigated by means of transient kinetics, which is an essential method to study the mechanisms of enzymes, protein-ligand and protein-protein interactions. Detailed transient kinetics complements high resolution structural studies and together the two methods can give a molecular explanation of biological function. In this course we will explain the basic principles of transient kinetics, make experiments using rapid kinetics instrumentations, and discuss the data analysis, including numerical integration and global fit. Each full day will consist of 2 hours of seminars 4 hours of hands-on practical work and finish with a 1 hour evaluation/feedback tutorial.

The following experiments are planned:
Kinetics of enzyme-catalyzed reactions in msec range using quench-flow technique.
Protein-ligand binding using stopped-flow technique.

Contact 1:	Prof. Dr. Marina V. Rodnina	rodnina@mpibpc.mpg.de	0551 201-2901
Contact 2:	Dr. Pohl Milon	pohl.milon@mpibpc.mpg.de	0551 201-2934

Comments: Participants can bring their protein of interest.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVZ No.:	340073	**Credits:**	1.0	**Date:**	6-8 Dec 2011

Title of Course (Course ID):	Affinity purification methods for the isolation of large heterogeneous macromolecular assemblies (A 82)
Group Leader / Supervisor(s):	Reinhard Lührmann / Klaus Hartmuth
Place:	MPI for Biophysical Chemistry, Seminar room, Tower III/1st floor

Participants:	min: 2	max: 4
Duration:	3 days	**Time on Day 1:** 9 a.m.
Preparatory Meeting:	No	

Course description:

One of the most powerful methods in present-day biochemical purifications is affinity purification. The practical will introduce the students to procedures in which we employ a molecular tag on the pre-mRNA substrate to isolate spliceosomes.

We make use of a pre-mRNA tagged with three MS2 RNA aptamers. This is incubated with the MS2-MBP fusion protein, which interacts (i) with the pre-mRNA by binding strongly to the MS2 hairpins; and (ii) with an amylose affinity matrix through the MBP (maltose-binding protein) portion of the protein. The latter interaction is fully reversible, under mild conditions, by competition with maltose.

Experimentally, the introduction to our affinity purification procedure consists of (i) preparation of a tagged pre-mRNA, (ii) assembly of spliceosomes on the tagged pre-mRNA, (iii) size fractionation of the spliceosomes by gradient sedimentation, and finally (iv) affinity selection of the spliceosomes

Contact 1:	Prof. Reinhard Lührmann	reinhard.luehrmann@mpi-bpc.mpg.de	0551 201 1407
Contact 2:	Dr. Klaus Hartmuth	khartmu@gwdg.de	0551 201 1650

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340087	**Credits:**	1.0	**Date:**	5-7 Sep 2011

Title of Course: (Course ID):	*Drosophila* neurogenetics (A 83)
Group Leader / Supervisor(s):	Prof. André Fiala, Prof. Martin Göpfert
Place:	Georg-August-University of Goettingen, Dept. of Molecular Neurobiology of Behavior, Dept. of Cellular Neurobiology (tba)

Participants:	min: 3	max: 6		
Duration:	3 days	**Time on Day 1:**	9:00 h	
Preparatory Meeting:	No			

Course description:

The fruit fly *Drosophila* represents a key model organism in modern neuroscience due to the genetic techniques by which neuronal circuits and genes can be manipulated. In this course a background in state-of-the-art genetic techniques used to investigate the function of neuronal circuits for behavior will be provided. Neuroanatomical, physiological, optogenetic and behavioral approaches will be exemplified both theoretically and in hands-on experiments. Topics include germ-line transformation, cell-type specific gene expression, optical calcium imaging, optogenetic manipulation of neuronal activity, genetic tools for neuronal silencing, behavioral and physiological studies.

Contact 1:	Prof. André Fiala	afiala@gwdg.de	0551 – 39 3356
Contact 2:	Prof. Martin Göpfert	mgoepfe@gwdg.de	0551 - 3899 437

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340049	**Credits:**	1.0	**Date:**	21-23 Sep 2011

Title of Course: (Course ID):	Chromatin-immunoprecipitation and epigenomic gene-profiling in the adult brain (A 84)
Group Leader / Supervisor(s):	Andre Fischer / Roman Stilling / Hope Agbemenyah / Sanaz Bahari Javan
Place:	European Neuroscience Institute, 3rd floor

Participants:	min: 3	max: 6

Duration:	2 days	**Time on Day 1:**	8:30 h

Preparatory Meeting:	Yes

Course description:

In addition the role of transcription factors it is now clear that gene-expression is also regulated via epigenetic mechanisms such as histone-modifications and DNA-methylation. In the last years new methods evolved to analyze epigentic gene-expression and those methods can now also be applied to the adult brain.

The aim of this course is to give an overview on Chromatin-immunoprecipitation (ChIP) using two different experimental appoaches. Participants will get hands on experience on how to perform ChIP analysis form the adult mouse brain followed by real time PCR analysis of gene promoter and coding regions of target genes.

Contact 1:	Andre Fischer	afische2@gwdg.de	0551 – 39 10378
Contact 2:			

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340119	**Credits:**	1.0	**Date:**	12-14 Dec 2011

Title of Course (Course ID):	Analysis of protein-DNA interaction *in vitro* by electrophoretic mobility shift assay (EMSA) (A 88)
Group Leader / Supervisor(s):	Anastassia Stoykova / Tran Cong Tuoc
Place:	Max Planck Institute for Biophysical Chemistry, Department of Molecular Cell Biology / Turm 5 / 1st floor, Am Fassberg 11, 37077 Göttingen

Participants:	min: 2	max: 4
Duration:	2.5 days	**Time on Day 1:** 9.30 h
Preparatory Meeting:	No	

Course description:

EMSA is a sensitive affinity electrophoresis technique to study protein-DNA or protein-RNA interactions in vitro. This procedure can determine if a protein or mixture of proteins is capable of binding to a given DNA or RNA. For the reason of the safety regulation to work with Radioactive reagents, we will provide theoretical introduction of the method with experimental observations.

During this course, the participants will learn and use following methods:

- Day1: Radioactive labeling of DNA probe (observation), Preparation of polyacrylamide gel, *in vitro* protein synthesis
- Day 2: Protein-DNA binding reaction (observation)
- Day 3: Autoradiographic exposure and data discussion

Contact 1:	Tran Cong Tuoc	tcong@gwdg.de	0551 - 201 1469
Contact 2:			
Comments:			

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340021	**Credits:**	0.5	**Date:**	b/w 7 and 11 Nov 2011

Title of Course (Course ID):	Subcellular fractionation (A92)
Group Leader / Supervisor(s):	Peter Rehling, Markus Deckers
Place:	Biochemistry II, Humboldtallee 23

Participants:	min: 2	max: 2
Duration:	1 day	**Time on Day 1:** 8:00 h
Preparatory Meeting:	No	

Course description:

In this course we will isolate functional organelles from cultured cells via subcellular fractionation.

Contact 1:	Markus Deckers	mdecker@gwdg.de	Tel. 0551-39 5983
Contact 2:			

Comments: The course takes place on one day in the week of 7-11 Nov 2011

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340075	**Credits:**	1.0	**Date:**	11-13 Jan 2012

Title of Course: (Course ID):	The application of RNA structure determination methodology to the analysis of RNA-protein interactions in RNP complexes (A 93)
Group Leader / Supervisor(s):	Reinhard Lührmann / Klaus Hartmuth
Place:	MPI for Biophysical Chemistry, Seminar room, Tower III/1st floor

Participants:	min: 3	max: 5
Duration:	3 days	**Time on Day 1:** 9 a.m.
Preparatory Meeting:	No	

Course description:

The course will provide an in depth presentation of current methods used in RNA structure determination. This will include a theoretical introduction to chemical RNA modification and hands-on introduction to the experimental procedures. These are: (i) handling of RNA; (ii) chemical modification of RNA using DMS and kethoxal; (iii) analysis of the modified RNA by primer extension.

In a second part, current procedures of RNA modification as applied to the analysis on RNA-protein interactions will be discussed. Experimentally, we will use hydroxyl radical footprinting and we will focus on the analysis of defined RNA-protein interactions from the field of spliceosome research.

Contact 1:	Prof. Reinhard Lührmann	reinhard.luehrmann@mpi-bpc.mpg.de	0551 201 1407
Contact 2:	Dr. Klaus Hartmuth	khartmu@gwdg.de	0551 201 1650

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340063	**Credits:**	1.0	**Date:**	16-18 Feb 2012

Title of Course (Course ID):	Introductory biostatistics with R (A 94)
Group Leader / Supervisor(s):	Katharina Hoff
Place:	Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11, CIP pool (basement)

Participants:	min: 5	max: 18		
Duration:	2.5 d	**Time on Day 1:**	9:00 h	
Preparatory Meeting:	No			

Course description:

R is a freely available programming language for statistics and graphics. This course covers the application of R on biostatistic problems. The following topics will be discussed and applied:
- descriptive statistics
- graphics
- t-test
- wilconxon test
- chi square test
- correlation analysis
- regression analysis
- ANOVA
- parametric and nonparametric multiple comparisons

Contact 1:	Dr. Katharina Hoff	Katharina.hoff@gmail.com	03834-864624
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340038	**Credits:**	1.0	**Date:**	26-27 Sep 2011

Title of Course (Course ID): Nerve cell culture and patch-clamp recordings from nerve cells (A 96)

Group Leader / Supervisor(s): Dr. Jeong Seop Rhee

Place: Neurophysiology Group, MPI for Experimental Medicine, Hermann-Rein-Str. 3

Participants: min: 2 max: 6

Duration: 2 d **Time on Day 1:** 9:00 h

Preparatory Meeting: No

Course description:

Keywords describing the course contents / lecture & exercises / target group

To study synaptic transmission mechanisms, my lab takes advantage of the single cell autaptic neuron culture system. This model system is ideally suitable for understanding the most important parameters underlying synaptic communication in a quantitative fashion. It is unique, as all synapses originate from a single axon. Thus different synaptic release modes can be quantified.

Step 1. Preparing autaptic neuron cultures
The autaptic preparation is defined by a single neuron that resides on an island of astrocytes with limited size, called a microisland culture. First, course participants will learn how the micoisland astrocyte culture is made and developed. Second, course participants will learn how to grow single neurons on the astrocyte islands. The applicants will learn to dissociate neurons from target areas of the mouse brain and to culture them on the astrocyte feeder culture.

Step 2. Measuring evoked synaptic transmission in autaptic cultures
In autaptic neuron cultures, all synapses that contact the dendrite of the neuron are formed by a single axon of the same neuron. Thus, all synapses can be stimulated to release transmitter at once by brief somatic depolarization. To understand the evoked synaptic responses, my lab uses a basic application of the patch clamp technique. Course participants will learn the basics of the measurement and quantification of synaptic responses in autaptic neuron cultures.

This course is intended for students who want to explore projects concerned with synaptic function in neurons.

Contact 1:	Dr. JeongSeop Rhee	rhee@em.mpg.de	0551-3899 694
Contact 2:			

Comments: Basic theoretical knowledge of nerve cell and synapse function and of patch clamp methodology is desirable.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVZ No.:	340062	**Credits:**	0.5	**Date:**	15 September 2011

Title of Course (Course ID):	Image Processing with ImageJ and MATLAB / Octave (A 97)
Group Leader / Supervisor(s):	Tobias Lapp, Sven Boekhoff, Eric Stellamanns
Place:	Max Planck Institute for Dynamics and Self-Organization, Bunsenstr. 10, Haus 10, (seminar room 3rd floor)

Participants:	min: 4	max: 20

Duration:	1 day	**Time on Day 1:**	9:00 h

Preparatory Meeting:	No

Course description:

Image processing has an increasing field of applications in science and industry. We explain basic steps of image preprocessing: Reducing of noise, deconvolution to reduce blurring of images, filtering inhomogeneities of the illumination and adapting the contrast. In a second step we show how to identify and separate objects in the images. The course will be based on examples of the work of the course supervisors. We will have presentations of the concepts and show how they are implemented in ImageJ and MATLAB / Octave. In a hands-on session the participants will have the chance to work with the image processing programs. We ask the participants to bring their own examples of images that they want to analyze.

Contact 1:	Tobias Lapp	tobias.lapp@ds.mpg.de	0551 – 5176 515
Contact 2:			

Comments:	Participants are encouraged to bring some of their images with them to the course or send them before per email.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

GGNB
Göttingen Graduate School for
Neurosciences and Molecular Biosciences

UniVz No.:	340066	**Credits:**	0.5	**Date:**	10-11 Nov 2011

Title of Course (Course ID):	Introduction to image processing in biology with ImageJ and Fiji (A 98)
Group Leader / Supervisor(s):	Dr. Mišo Mitkovski
Place:	MPI for Experimental Medicine, Hermann-Rein-Str. 3, 37077 Göttingen, Room A1

Participants:	min: 5	max: 10

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

An ever-increasing amount of biological events can be quantified by means of microscopy. A well-designed experiment may yield spatiotemporal information with regard to events taking place at the cellular or molecular level. A proper evaluation thereof requires understanding of what an image is, how it is generated and what subsequent processing methods are available.

Therefore, the underlying motivation for the course is the quantification of biological events through analysis of images generated with a microscope. The freely available “ImageJ” (http://rsbweb.nih.gov/ij/) and its “Fiji” variant (http://pacific.mpi-cbg.de/wiki/index.php/Fiji) are some of the several open-source applications that will be introduced towards this goal.

In particular, the components of an image will be discussed, as well as frequently used image types within their appropriate context. Basic concepts such as “lookup tables”, “image calibration” or the creation of multi-channel (overlay) images will be explained along with several standard situations that a microscope user is faced with on the road toward a publication.

More advanced topics will include the modification of ImageJ installs to suit the respective need. Moreover, examples of basic image arithmetic and further image processing related to image stacks (i.e. time series), 3D reconstruction and automated image processing will be discussed.

Students attending the course may suggest topics they wish to have covered.

Contact 1:	Mišo Mitkovski	mitkovski@em.mpg.de	0551-3899 504
Contact 2:			

Comments:	The date for the course can be changed. It is preferable if students have their own laptops. Alternatively, a computer lab will be necessary. The course will last 4 h/day.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340061	**Credits:**	1.0	**Date:**	10/12/13/14 Oct 2011

Title of Course: (Course ID):	Basic statistics for graduate students in the life sciences (A 100)
Group Leader / Supervisor(s):	Prof. Tim Friede / Dr. Frank Konietschke / Dr. Katharina Lange
Place:	Department of Medical Statistics, Humboldtallee 32, Computer Room (CIP)

Participants:	min: 5	max: 20			
Duration:	4 d à 3 h	**Time on Day 1:**	14:00 h		
Preparatory Meeting:	No				

Course description:

This course is an introduction to the fundamental statistical concepts used in design and analysis of experiments in the life sciences. The course covers the following topics:

- *A primer in data management*
  - *How to set up a suitable spreadsheet for my experiment?*
  - *Being aware of data quality: How to conduct effective quality checks?*
  - *How to import data to R?*
- *Basic statistics for the design and analysis of experiments*
  - *Descriptive statistics and data visualization*
  - *Fundamental concepts of statistical inference: hypothesis testing and confidence intervals*
  - *Comparing two groups (considering various types of endpoints)*
  - *Basic designs*
    - *one-way factorial designs*
    - *two-way factorial designs*
    - *split-plot designs*
    - *cross-over designs*
  - *Sample size calculation: How many subjects or replications do I need?*
- *Interpretation of results*
- *The course will include applications in the statistical software package R (www.r-project.org).*

Contact 1:	Prof. Tim Friede	Tim.Friede@med.uni-goettingen.de	Phone: 0551-39 4991
Contact 2:	Dr. Frank Konietschke	fkoniet@gwdg.de	Phone: 0551-39 4989

Comments:

Basic knowledge of programming in R is an advantage. Lecture and exercises on four afternoons from 14:00 – 17:15 h.

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340059	**Credits:**	1.0	**Date:**	23-24 Jan 2012

Title of Course: (Course ID):	Crystallization of biological macromolecules (A 102)
Group Leader / Supervisor(s):	Vlad Pena, Jana Schmitzova, Ulrich Steuerwald, Inessa De, Tales de Moura, Jürgen Wawrzinek
Place:	Max Planck Institute for Biophysical Chemistry, X-Ray Crystallography group, tower 3, 37077 Göttingen

Participants:	min: 2	max: 5	
Duration:	2 days	**Time on Day 1:**	09:00 h
Preparatory Meeting:	No		

Course description:

X-ray crystallography is the most powerful tool for the structure determination of macromolecules at atomic resolution. This practical course will provide a comprehensive introduction to state-of-the-art methodology applied in the field of macromolecular crystallography.

One part of the course will cover methods of sample preparation and characterization required prior to crystallization. Topics: bioinformatics for target selection, baculoviral recombinant expression, thermal shift assays and limited proteolysis.

The second part is dedicated to crystallographic methods themselves. Topics: high-throughput screening, storage and imaging of the plates, automated and manual optimization, crystals manipulation and cryo-protection.

Contact 1:	Vlad Pena, PhD	vpena@gwdg.de	Tel. 0551-201 1046
Contact 2:			

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340086	**Credits:**	1.0	**Date:**	Nov 2011

Title of Course (Course ID):	Tissue processing and immunohistochemistry on tissue sections of genetically engineered mouse models (A 107)
Group Leader / Supervisor(s):	Felix H. Brembeck, Nadine Thiede
Place:	UMG, University Hospital, Research Laboratory "Tumor Biology and Signal Transduction", Dep. Hematology/Oncology, Room 1D4 681

Participants:	min: 2	max: 6			
Duration:	2 days	**Time on Day 1:**	10:00 h		
Preparatory Meeting:	No				

Course 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 early organ development and the development of intestinal and breast cancer.

Participants of this course will perform basic protocols, including hematoxylin-eosin stainings and immunohistochemistry. We will analyze and compare selected markers for differentiation and proliferation on tissue sections of our genetically engineered mouse models. The stainings will be evaluated for the morphology, the presence of (pre-)malignant transformations and the expression pattern of the selected markers.

Contact 1:	Prof. Dr. Felix H. Brembeck	brembeck@med.uni-goettingen.de	Tel. 0551-39 10568
Contact 2:	Nadine Thiede	thiede@med.uni-goettingen.de	Tel. 0551-39 10568

Comments:

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340083	**Credits:**	0.5	**Date:**	9 Sep 2011

Title of Course (Course ID):	Homologs and Paralogs – how they evolve and how to distinguish them (A 108)
Group Leader / Supervisor(s):	Gregor Bucher, Ernst Wimmer
Place:	Dept. of Developmental Biology, Ernst-Caspari-Haus / GZMB building, Justus-von-Liebig-Weg 11

Participants:	min: 3	max: 8

Duration:	1 day*	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

The comparison of gene function across species requires that the respective true orthologs are compared. These can be identified by sequence analysis.

- In the introductory lecture I will introduce to the evolution of genes and sequences with focus on the different origin of orthologs and paralogs.
- In the practical in silico work you will determine orthologs and paralogs of a given gene by performing blast searches, alignments and the calculation of phylogenetic trees.
- Subsequently, you are invited to identify orthologs of your favorite gene.

Contact 1:	Prof. Gregor Bucher	gbucher1@gwdg.de	Tel. 0551-39 5426
Contact 2:			

Comments:	9:00-15:00 If you wish you may bring the protein sequence of your favorite gene

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340112	**Credits:**	1.0	**Date:**	17-18 Oct 2011

Title of Course (Course ID):	MySQL for biologists (A 112)
Group Leader / Supervisor(s):	Martin Göpfert, Guvanch Ovezmyradov
Place:	Schwann-Schleiden-Forschungszentrum (address and room to be announced)

Participants:	min: 2	max: 6

Duration:	2 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

MySQL is a popular relational database management system. Many biological databases like ENSEMBL and Gene Ontology use MySQL to manage their data. Moreover, MySQL can be an excellent solution for storing experimental data. Therefore, many research labs established a way of storing their data locally using MySQL and related technologies.

In this course students will learn how to use MySQL to access, query and export biological data. During the hands-on training participants will learn how to perform various tasks on a database using MySQL commands. First day of the course will cover general concepts. On the second day participants will practice with exercises. These exercises will include installing and querying local databases as well as accessing and querying remote databases. For example, participants will learn how to save their own data as SQL tables in a local database or how to find information about their favorite gene inside a remote database (such as ENSEMBL and Gene Ontology). This knowledge will help to access and use biological databases more effectively.

No prior experience is required. Computers will be provided and you are welcome to bring yours.

Contact 1:	Guvanch Ovezmyradov	govezmu@gwdg.de	Tel. 0551-3899 406
Contact 2:			

Comments:	

GGNB Short Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340098	**Credits:**	1.0	**Date:**	Nov/Dec 2011

Title of Course: (Course ID):	NGS and HTP SNP typing (A 113)
Group Leader / Supervisor(s):	Bertram Brenig / Ekkehard Schütz
Place:	Institute of Veterinary Medicine, Burckhardtweg 2, 37077 Göttingen

Participants:	min: 2	max: 4

Duration:	3 days	**Time on Day 1:**	09:00 h

Preparatory Meeting:	No

Course description:

Participants will be introduced to NGS and HTP SNP typing on the SOLiD4 and Illumina HiScan platforms.

Contact 1:	Prof. Bertram Brenig	bbrenig@gwdg.de	Tel. 0551-39 3383
Contact 2:			

Comments:

GGNB Extended Methods Courses: Sep 2011 – Feb 2012

Göttingen Graduate School for Neurosciences and Molecular Biosciences

UniVz No.:	340125	**Credits:**	3.0	**Date:**	25-30 Sep 2011

Title of Course: Advanced Light Microscopy (E 01)

Group Leader / Supervisor(s): Stefan Hell, Alexander Egner, Roman Schmidt

Place: Max Planck Institute for Biophysical Chemistry, Lectures: Prandtl Lecture Hall, Hand-on-Courses: Dept. of NanoBiophotonics and other hosting research groups

Participants: min: 10 max: 40

Duration: 5 days **Time on Day 1:** 15:00 h

Preparatory Meeting: No

Course description:

The main course will take place in the Department of NanoBiophotonics at the Max Planck Institute for Biophysical Chemistry under Prof. Dr. Stefan W. Hell, Dr. Alexander Egner and Dr. Roman Schmidt. It is divided into two parts, a first part of lectures and a second part of hands-on experiments.

Part I – Lectures (Sunday – Tuesday) *For all participants!*
The first part consists of lectures on the basics and theory of all topics covered in the different modules of the extended course. These lectures are given both by GGNB faculty members and external experts in the field of light microscopy. Venue: MPI-bpc, Prandtl Lecture Hall.

Part II – Hands-on courses (2 days between Wednesday and Friday) *3-5 students per course!*
In the second part, hands-on advanced course units (3-5 students each) will be offered in the laboratories of the participating faculty members. Each of these course units will take two days (Wed/Thu or Thu/Fri). Each participant in the extended methods course will have the opportunity to participate in one of these course units.

Topics for 10 hands-on advanced course units:

- 2-3 * Confocal microscopy (Bodenschatz, Rehfeldt, Schu)
- 1 * FCS/FLIM (Eggeling)
- 1 * FRET (Wouters/Bunt)
- 1 * Calcium imaging (Moser)
- 2 * STED (Rizzoli, Egner)
- 1 * STED (Hell)
- 1 * Single molecule localization (Egner)

Contact 1:	Dr. Alexander Egner	Alexander.Egner@llg-ev.de	Tel. 0551-5035 35
Contact 2:	Dr. Roman Schmidt	roman.schmidt@mpi-bpc.mpg.de	Tel. 0551-201 2511 or 0551-201 2621

Comments: Further details regarding the lecturers, lecture topics and hands-on courses will be announced separately