E 03 - GGNB Extended Methods Course 2013

Electrophysiology

ELECTRAIN 2013
(6 – 17 May 2013)

European Neuroscience Institute Göttingen
ENI-G

Faculty:

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E 03 - GGNB Extended Methods Course 2013

ENI Electrophysiology Training (ENI-ELECTRAIN)

Date: 6 – 17 May 2013
Location: European Neuroscience Institute (ENI-G), Grisebachstr. 5, 37077 Göttingen
Participants: 8 for practical course (lectures are open for all PhD students)
(2 groups A+B of 4 participants each, groups switch topics after 1st week, participation for both weeks mandatory, topics will be assigned during the course)

TOPIC 1: In vitro Electrophysiology of Expressed Ion Channels in *Xenopus laevis* oocytes (STÜHMER + PARDO)
(4 participants)

TOPIC 2: In vivo Electrophysiology of Identified Neurons in *Hirudo medicinalis* (HÖRNER + FERBER)
(4 participants)

TOPIC 3: Measurement of synaptic parameters in mouse hippocampal organotypic slices (SCHLÜTER + NN)
(4 participants)

Week 1/2 (6 – 10 May 2013 and 13 – 17 May 2013) ENI Lecture Hall, ENI Teaching Labs

**Topic:** Expression and electrophysiological characterization of different ion-channels in the *Xenopus* oocyte expression system

**Techniques:** cDNA expression techniques in *Xenopus* oocytes, Two-electrode voltage clamp configuration and measurements, Quantitative evaluation and statistical analysis of different ion channels/conductances

**Lectures:** see separate schedule from 9-11h, ENI Lecture Hall (open to all GGNB students)

**Practical Training:** Monday through Friday from 13-18h, ENI Teaching Labs

**Presentation of results:** Friday 9-12h, ENI Lecture Hall, Friday afternoon: Cleaning-up

Week 1/2 (6 – 10 May 2013 and 13 – 17 May 2013) ENI Lecture Hall, ENI Teaching Labs

**Topic:** In-vivo electrophysiology of identified neurons in *Hirudo medicinalis*

**Techniques:** Single and double intracellular recording techniques, single cell fluorescent labeling and 3d-imaging, Characterization of spontaneous and stimulus-evoked electrical activity patterns in identified neurons, Analysis of synaptic connectivity and network properties, Pharmacological characterization of different electrical conductances

Last update: 16 January 2013
Week 1/2 (6 – 10 May 2013 and 13 – 17 May 2013) ENI Lecture Hall, ENI Teaching Labs

**Topic:** Measurement of synaptic parameters in mouse hippocampal organotypic slices

**Techniques:** Miniature EPSC recording of CA1 pyramidal cells, evoked AMPA receptor and NMDA receptor mediated synaptic transmission of Schaffer collateral CA1 pyramidal cell synapses, lentiviral-mediated molecular manipulation of CA1 pyramidal cells

**Lectures:** Monday and Tuesday from 9-11h, ENI Lecture Hall (open to all GGNB students)
**Practical Training:** Monday through Thursday from 13-18h, ENI Teaching Labs
**Presentation of results:** Friday 9-12h, ENI Lecture Hall, Friday afternoon: Cleaning-up

SELECTED LITERATURE:

**TOPIC 1:** *In vitro* Electrophysiology of Expressed Ion Channels in *Xenopus laevis* oocytes


**TOPIC 2:** *In vivo* Electrophysiology of Identified Neurons in *Hirudo medicinalis*


**TOPIC 3:** Measurement of synaptic parameters in mouse hippocampal organotypic slices