

Europäisches Kompetenzzentrum Neurowissenschaften (ENI) und Europäisches Kompetenznetzwerk (ENI-NET)

European Neuroscience Institute (ENI) and Network of European ENI Institutions (ENI-NET)

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Dr. rer. nat. Oliver Schlüter

Dr. rer. nat. Silvio O. Rizzoli

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KURZDARSTELLUNG

Das ENI ist eine im Jahr 2000 gegründete Einrichtung der Universitätsmedizin Göttingen (UMG) in Kooperation mit den Max-Planck-Instituten für biophysikalische Chemie (MPI-BPC) und Experimentelle Medizin (MPI-EM). Zusätzlich wird das ENI finanziell von der Schering AG unterstützt.

Ziel des ENI ist die Förderung von unabhängigen Nachwuchswissenschaftlern auf höchstem wissenschaftlichen Niveau. Arbeitsgruppenleiter werden, obwohl unabhängig, durch einen Mentor in ihrer Forschung unterstützt. Die unabhängigen Arbeitsgruppen des ENI sind eng mit dem Göttingen übergreifenden DFG Forschungszentrum 103 „Molekularphysiologie des Gehirns (CMPB)“ verknüpft. Das Institut widmet sich den aktuellen Fragen der quantitativen molekularen Mikroskopie und den molekularen Ursachen von neurologischen und psychiatrischen Erkrankungen.

Derzeit arbeiten am ENI fünf Nachwuchsforschungsgruppen. Die Forschungsaktivitäten am ENI-Göttingen sind folgenden Forschungsgebieten zuzuordnen:

- ▷ Molekulare Neurogenetik
- ▷ Altern und kognitive Leistungen
- ▷ Molekulare Neurobiologie

- ▷ STED Mikroskopie synaptischer Prozesse
- ▷ Entwicklungsneurobiologie.

Das ENI in Göttingen diente als Vorbild für die Entstehung von 18 weiteren ENI Instituten in 10 europäischen Staaten. Diese ENI Institute haben sich zu einem EU finanzierten europaweiten Netzwerk (ENI-NET) zusammengeschlossen, das die interdisziplinären Kooperationen und einen regen wissenschaftlichen Austausch zwischen den Gruppen verbessern soll.

ABSTRACT

The ENI was established in the year 2000 by the University Medicine Göttingen in cooperation with the Max-Planck-Institutes for Biophysical Chemistry (MPI-BPC) and Experimental Medicine (MPI-EM). In addition, it is financially supported by the Schering AG.

The ENI was created to promote young and independent investigators at the highest scientific stage. Although scientifically independent, the group leaders are supported by a mentor as regards to their research. The research groups at the ENI Göttingen are closely connected to the DFG (German Research Foundation) network CMPB (Research Centre Molecular Physiology of the Brain). The institute is dedicated to the current questions of quantitative

molecular microscopy and molecular causes of neurological and psychiatric diseases.

Five groups are currently working at ENI Göttingen. The research activities can be allocated in the following research areas:

- ▷ Molecular Neurogenetics
- ▷ Aging and Cognitive diseases
- ▷ Molecular Neurobiology
- ▷ STED Microscopy of Synaptic Function
- ▷ Developmental Neurobiology.

The ENI in Göttingen has served as a role model for the formation of 18 other ENI institutes in 10 different European countries. These institutes have established a Europe wide Network (ENI-NET), financed by the EU. The ENI-NET shall improve and strengthen the interdisciplinary cooperation and the scientific exchange by supporting mobility within the network.

Nachwuchsgruppenleiter/innen Junior Research Group Leaders

Dr. Stefan Eimer: Trafficking and sorting of ion channels

The group aims to understand the mechanisms and rules that control the trafficking and sorting of ion channels within the secretory apparatus. We are focusing on the nicotinic acetylcholine receptor family of ligand-gated ion channels, which have been implicated in numerous neurological and neurodegenerative diseases. To find new molecules involved in these processes, we take advantage of the nematode *Caenorhabditis elegans* as a main model system, and use a combination of genetic, cell biological, and biochemical approaches as well as electro-physiology and electron-microscopy.

Dr. André Fischer: Learning and memory processes under physiological and pathological conditions

The group aims to understand the molecular mechanisms underlying learning and memory processes under physiological and pathological conditions. We are particularly interested to understand cognitive impairment associated with normal aging as well as the pathogenesis of mental and neurodegenerative diseases.

To this end we combine molecular, biochemical, pharmacological and behavioral approaches using mice as model organisms.

Dr. Oliver Schlueter: Molecular mechanisms of synaptic plasticity

A major goal of this group is to elucidate the molecular events of mechanistically distinct forms of synaptic plasticity, regulating changes in synaptic efficacy. Mouse genetics and/or viral-mediated gene transfer allow to manipulate the molecular composition of single neurons in a spatial and temporal controlled manner.

Dr. Silvio O. Rizzoli: Synaptic vesicle function-recycling

The group takes advantage of the increased imaging resolution provided by STED to investigate synaptic vesicle function, with an emphasis on synaptic vesicle recycling.

Synaptic vesicles are among the smallest known organelles (30-50 nm in diameter) that are located in small areas in the synapses (about 1 micron in diameter). STED microscopy allows

imaging of vesicles and protein domains, to study the patterning of protein domains and the molecular architecture in the synapse.

Dr. Till Marquardt: Embryonic development of motor and sensory neurons

Our research aims at understanding how, during embryonic development, the precise connections of motor and sensory neurons with the musculature are formed and how they are ultimately assembled into the functional neuromuscular circuitry.

We study the role of cell-surface receptors and cell autonomously acting proteins in controlling specific aspects of neuromuscular development.

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Mitglieder des ENI-Netzwerks Participants in the ENI-Network

The Instituto de Neurociencias de Alicante

Ctr. Neurogenomics and Cognitive Research (CNCR) Amsterdam

The Neuroscience Institute at Bordeaux

Neuroscience at Bristol

Institute of Molecular Biology and Biotechnology Crete

Centre for Neuroscience Research, Edinburgh

The Center for Neuroscience and Cell Biology (CNC) Coimbra

ENI at Göttingen

The Brain and Mind Institute Lausanne

ENI at University College London

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The Institute of Experimental Medicine ASCR in Prague

The European Brain Research Institute in Rome

The Neuroscience Institute at Seville

ENI at Karolinska Institutet Stockholm

ENI at Strasbourg

The Nencki Institute at Warsaw