Neuroscience Colloquium
Winter Semester 2010/2011

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New Genes for Cortical Arrhythmias

Critical progress in the discovery of genes linked to cortical excitability and human epilepsies has been made in the last decade, and the epilepsy genome continues to expand. While the defined monogenic syndromes recognized to date account for only a minority of individuals with seizure disorders, the functional diversity of these genes provide extraordinary insight into the biological control pathways of synchronous neuronal activity in the brain, and a valuable opportunity to define therapeutic targets. Two new gene pathways identified in mutant mouse models in the Noebels laboratory promise rapid translation into clinically useful gene-directed therapies. The KCNQ1 gene encoding a delayed rectifier cardiac potassium channel is expressed in brain neurons, and human mutations in this channel produce a combined phenotype of epilepsy and cardiac LQT syndrome, demonstrating the first monogenic mechanism for sudden death in epilepsy (SUDEP). Overexpression of mutant forms of APP lead to epilepsy in mice and humans, providing a novel dynamic mechanism for cognitive impairment in Alzheimer's Dementia. In a large project in collaboration with the Human Genome Sequencing Center, the Noebels laboratory is also exploring the contribution of genetic variation in human ion channels to cortical excitability by assembling personal profiles of mutations in several hundred ion channel subunit genes. These profiles may explain the "formes frustes" of many inherited errors of ion channels and help predict the risk of neurological disorders.

Location: BCCN lecture theater,
Bernstein Center for Computational Neuroscience
Humboldt-Universitaet zu Berlin
Philippstr. 13, Haus 6

Date: Friday, October 29th, 4:00 p.m.

Host: Christian Rosenmund

Supported by:
SFB 665 "Developmental Disturbances in the Nervous System"
GRK 1123 "Cellular Mechanisms of Learning and Memory Consolidation in the Hippocampal Formation"
SFB-TRR 43 "The brain as a target of inflammatory processes"
NeuroCure

Organized by the Christian Rosenmund and Stephan Sigrist labs
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