

Synaptic transmission and plasticity

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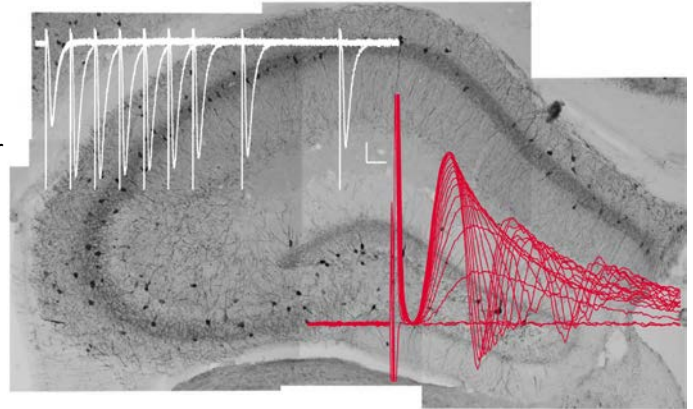
Background

The brain is perhaps the most complex organ in the human body. If you share our fascination of this area, our laboratory may be the right place for you.

We focus on molecular neurophysiological studies in the brain of transgenic mouse models and rodent models of neurodegenerative disorders.

We utilize isolated tissue from transgenic animals and electrophysiological techniques and combine these with pharmacological tools.

Ultimately our studies may help future patients suffering from brain-related disorders.



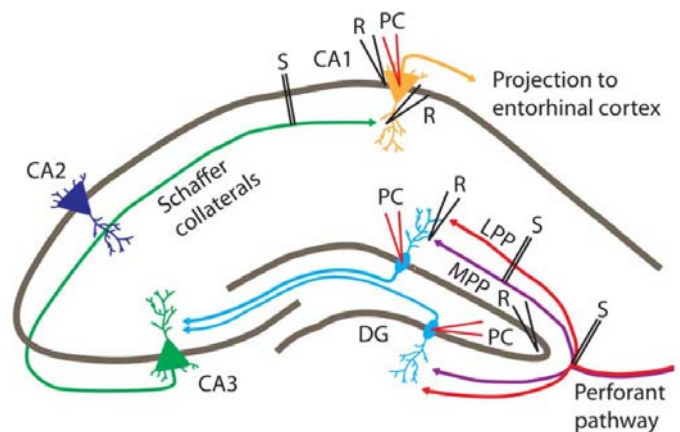
Projects and techniques

Key projects in the lab focus on the sortilin related receptor SorCS3 and allosteric modulators of AMPA receptors.

We welcome students from AU at all levels and we regularly have visitors under the Erasmus exchange program.

Successful candidates will be trained in electrophysiological techniques (*in vitro*), analysis of synaptic transmission and plasticity, PCR-based genotyping and immunohistochemical staining of selected markers of excitatory and inhibitory neurotransmitter systems.

All projects are aimed at publication.



Experimental setup

Our experiments focus on the hippocampal formation, which is a brain area crucially involved in learning and memory. Using specialized electrodes (marked with S, R and PC) we analyze the neuronal activity and how it is affected by genetic, electrical and pharmacological manipulations (Figure published in Christiansen et al., 2017, Hippocampus).

Relevant publications from the laboratory:

SR ANDREASEN, CJ LUNDBYE, TB CHRISTENSEN, KD THIELSEN, T SCHMITT-JOHN AND MM HOLM "Excitatory-inhibitory imbalance in the brain of the wobbler mouse model of amyotrophic lateral sclerosis substantiated by riluzole and diazepam" **2017 Neuroscience Letters**

GB CHRISTIANSEN, KH ANDERSEN, S RIIS, A NYKJAER, U BØLCHO, MS JENSEN AND MM HOLM "The Sorting Receptor SorCS3 is a Stronger Regulator of Glutamate Receptor Functions Compared to GABAergic Mechanisms in the Hippocampus" **2017 Hippocampus**

GB CHRISTIANSEN, B HARBÄK, SE HEDE, AH GOULIAEV, K FRYDENVANG, L OLSEN, J EGEBJERG, JS KASTRUP & MM HOLM "A novel dualistic profile of an allosteric AMPA receptor modulator identified through studies on recombinant receptors, mouse hippocampal synapses and crystal structures" **2015 Neuroscience**