



Introductory Remarks to Symposium 30

Inhibitory synapse diversity in health and disease

Theofilos Papadopoulos and Dilja Krüger-Burg, Göttingen

Synaptic inhibition plays a key role in shaping and orchestrating the flow of information through neuronal circuits, and abnormalities in inhibitory synaptic transmission have been linked to a wide range of psychiatric and neurodevelopmental disorders. Accordingly, substantial interest has arisen in identifying the mechanisms governing the development and function of inhibitory synapses and circuits. A defining feature of the inhibitory system is its staggering complexity: Inhibitory neurons can be subclassified into a multitude of categories based on their morphological, physiological and molecular characteristics, and each subtype plays a highly specific role in regulating network function and behavioral outputs. In parallel, a similar heterogeneity is being uncovered at the synaptic level, with different inhibitory synapse subtypes differing greatly in their complement of GABA_A subunits and synaptic scaffolding proteins, and accordingly in their functional properties. However, the nature of these components, the mechanisms by which they regulate different inhibitory synapse subtypes, and the role that they play in specific inhibitory circuits and relevant behaviors, are only just beginning to be uncovered. Given that the GABAergic system has been identified as a key target for pharmacological interventions in several psychiatric and neurodevelopmental disorders, a detailed investigation of this complexity is crucial for the successful development of new and specific treatment strategies.

In the present symposium, we will discuss recent progress in identifying how inhibitory synapse diversity contributes to brain function in health and disease, with the aim of highlighting this issue from multiple complementary angles. Our speakers are leading experts in the study of inhibitory synapses and circuits, and they have been selected to represent a wide range of approaches, ranging from molecular studies investigating the mechanisms that govern the assembly of inhibitory postsynaptic complexes, to circuitry studies of inhibitory synapse diversity in network function and their contributions to normal and pathological behaviors.

Symposium 30

Friday, March 22, 2019
14:30 - 16:30, Lecture Hall 8

Chairs: Theofilos Papadopoulos and Dilja Krüger-Burg,
Göttingen

14:30 **Opening Remarks**

14:35 Matthias Kneussel, Hamburg
NEURONAL GABA_A RECEPTOR TRAFFICKING
AND TURNOVER UNDERLYING SYNAPTIC
TRANSMISSION AND COGNITIVE FUNCTION
(S30-1)

15:00 Jonas-Frederic Sauer, Freiburg
ALTERED PREFRONTAL PYRAMIDAL-GABAERGIC
INTERNEURON CIRCUIT ARCHITECTURE IN
A GENETIC MOUSE MODEL OF PSYCHIATRIC
ILLNESS (S30-2)

15:25 Martin Zeller, Tübingen
AMYGDALA INTERCALATED NEURONS FORM
AN INTERCONNECTED AND FUNCTIONALLY
HETEROGENEOUS NETWORK (S30-3)

15:35 Scott Soderling, Durham, USA
PROTEO-CONNECTOMICS TO DISCOVER
NOVEL MECHANISMS OF INHIBITION *IN VIVO*
(S30-4)

16:00 Dilja Krüger-Burg, Göttingen
THE CELL ADHESION MOLECULE IGSF9B
REGULATES INHIBITORY SYNAPSE FUNCTION
IN THE AMYGDALA ANXIETY CIRCUITRY (S30-5)

16:25 **Concluding Remarks**