



**Title:** Keeping the Balance between Change and Stability:  
Cellular Correlates of Learning, Memory and Forgetting

**Speaker:** Dr Martin Korte  
Professor of Cellular Neurobiology &  
Director of Zoological Institute of the TU Braunschweig, Germany

**Date:** 10 June 2013 (Monday)

**Time:** 10 am

**Venue:** Centre for Life Sciences Auditorium  
Level 1  
28 Medical Drive, Singapore 117456

**Abstract:**

Changes in the connectivity of neurons - activity-dependent synaptic plasticity - regulate the fine-tuning of neuronal networks during development and during adult learning. Synaptic plasticity includes functional and structural modifications at neurons. Both changes occur in a 'positive' (synapse strengthening, dendritic spine growth) and in a 'negative' way (synapse weakening, dendritic spine loss). On the other hand, *in vivo* imaging studies show that the large-scale organization of axons and dendrites as well as the majority of synaptic structures in several areas of the mature, intact brain shows a remarkable stability. These observations implicate the existence of a set of molecules regulating the stability of mature neuronal networks at the end of development. Dendritic spine number and dendritic arbor complexity can change during activity-dependent plastic processes. The underlying mechanisms and molecules are largely unknown. Neurotrophins modulate neuronal morphology as well as support functional changes at synapses. So far mainly the role of BDNF and its TrkB receptor has been by us and others in order to study processes of positive synaptic plasticity, synaptic scaling and synaptic tagging. In addition we are interested in process of negative synaptic plasticity (weakening of synapses and loss of synaptic structures) and we study mechanisms and molecules that mediate stability of neuronal networks. In search for factors restricting functional as well as structural plasticity processes, we investigated the role of the myelin-associated protein Nogo-A, whose function as negative regulator of structural changes in the CNS is well known. We analysed synaptic transmission as well as long-term synaptic plasticity (LTP/LTD) in the presence of function blocking anti-NogoA or anti Nogo receptor (NgR) antibodies and in the mature hippocampus of NogoA KO mice.

Finally the talk will address our current research on the origin and progression of the Alzheimer Disease - which is foremost a disease of forgetting.

**About the Speaker**

Dr Korte is a Professor of Cellular Neurobiology at the Technische Universität (TU) Braunschweig, Germany. He obtained his PhD and postdoctoral training at the Max-Planck-Institute (MPI) of Neurobiology at München-Martinsried in Germany. Before joining TU Braunschweig, he was a research group leader at Janssen-Cilag and MPI for Neurobiology. His research focuses on cellular mechanisms of learning and memory, and forgetting. He is one of the most cited neuroscientists in Germany. Besides being a distinguished scientist, he also shows his talent in explaining exciting scientific results to a lay audience. His achievement in the public understanding of science was recognized by award of the Karl-Heinz-Beckhartz prize. Professor Korte was also a founding member of the national "Young Academy" ("Junge Akademie").

**Convenor:** Dr Saji Kumar Sreedharan

*All Are Welcome*