The Singapore Bioimaging Consortium (SBIC)
presents a seminar

on

# "How to build a Synapse: Trans-synaptic interactions instruct Synaptogenesis"

**Speaker:** **Dr Thomas Biederer**
**Associate Professor**
**Department of Neuroscience**
**Tufts University Medical School**
**Host :** **Dr Han Weiping**
**Date :** **Tuesday, 1 December 2015**
**Time :** **3.00pm – 4.00pm**
**Venue :** **SBIC Seminar Room**
**11 Biopolis Way**
**Level 2, Helios Building, Singapore 138667**
**(Please enter via Level 1)**

## Abstract

Our research goal is to understand on a molecular and functional level how neurons form synapses with each other. We have identified and characterized SynCAM proteins as a class of synaptic immunoglobulin adhesion molecules, and we use them as entry point to delineate how trans-synaptic interactions organize synapses. SynCAMs are sufficient to drive the formation of excitatory synapses in cultured neurons and in mouse models and we have determined that SynCAMs exert their synaptogenic activity through specific adhesive interactions across the synaptic cleft. This talk will focus on two current research projects. First, we use superresolution and biophysical approaches to define the topography of the synaptic cleft, and it will be discussed how the synaptic cleft is organized on a nanoscale. Second, data will be presented about a postsynaptic signaling pathway that coordinates synapse and dendrite development via GTPase regulation.

## About the Speaker

Dr Thomas Biederer received a PhD in Biology from the Humboldt-Universität zu Berlin, Germany. Dr Biederer then pursued postdoctoral training with Dr Thomas Südhof at the UT Southwestern Medical Center at Dallas to investigate mechanisms of synapse formation. He became faculty member at Yale University in 2003, and joined in 2013 the Tufts University Medical School, where he is Associate Professor in the Department of Neuroscience. Dr Biederer's multidisciplinary program is motivated by his interests in synaptic biology and the profound disease relevance of synaptic aberrations. His focus lies on the organization of excitatory synapses by

adhesive interactions across the synaptic cleft. On a molecular level, Dr Biederer analyzes the signaling pathways driving synapse formation and the functional cooperation of trans-synaptic interactions. He complements this with studying *in vivo* the formation of synaptic connections and the activity-dependent wiring of neuronal networks, using transgenic and knock-out mouse models. Dr Biederer's group has additionally developed translational research programs on the effects of drugs of abuse on synaptic connectivity and on synaptic aberrations in autism-spectrum disorders and schizophrenia.

***--- Admission is free and all are welcome ---***