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SFB 1089

Bonn Lecture Series in Neuroscience

Nanostructure and alignment in single synapses

Tom Blanpied

University of Maryland, USA

Tuesday, June 06th 201 716:00h

DZNE Auditorium (Sigmund-Freud-Str. 27)

Research in the Blanpied Lab examines protein organization at synapses, and seeks to understand mechanisms that control this organization to regulate synaptic transmission.

The dendrites of neurons receive and integrate inputs from hundreds or thousands of partner cells, and most of this input arrives at highly specialized sites called synapses that are distributed over the dendritic tree. Improper regulation of synaptic transmission is implicated in an enormous variety of psychiatric disorders: an imbalance of glutamatergic neurotransmission in particular has been identified in the pathophysiology of diseases ranging from schizophrenia and autism to epilepsy and addiction, and excitatory synapses may be among the earliest targets of Alzheimer's Disease (AD) pathogenesis. A key means of synaptic regulation is the control of the number of postsynaptic neurotransmitter receptors available for activation by glutamate release. Thus, understanding the protein trafficking mechanisms involved has broad implications not only for understanding the etiology of many diseases but more generally for defining the cellular basis of nervous system function and disorder.

SelectedPublications

A trans-synaptic nanocolumn aligns neurotransmitter release to receptors. Tang AH, Chen H, Li TP, Metzbower SR, MacGillavry HD, **Blanpied TA**. *Nature*. 2016 Aug 11;536(7615):210-4. Epub 2016 Jul 27.

Topographic Mapping of the Synaptic Cleft into Adhesive Nanodomains. Perez de Arce K, Schrod N, Metzbower SW, Allgeyer E, Kong GK, Tang AH, Krupp AJ, Stein V, Liu X, Bewersdorf J, **Blanpied TA**, Lucić V, Biederer T. *Neuron*. 2015 Dec 16;88(6):1165-72. doi: 10.1016/j.neuron.2015.11.011.

Single-molecule discrimination of discrete perisynaptic and distributed sites of actin filament assembly within dendritic spines. Frost NA, Shroff H, Kong H, Betzig E, **Blanpied TA**. *Neuron*. 2010 Jul 15;67(1):86-99. doi: 10.1016/j.neuron.2010.05.026.

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