

Neuroscience Colloquium

Summer Semester 2017

Lecture is held **Thursday, 5 p.m.**
Venue: **Auditorium**, Virchowweg 6, CCO

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On the importance of autoinhibitory interactions to enable the exquisite regulation of neurotransmitter release

The release of neurotransmitters by Ca^{2+} -triggered synaptic vesicle exocytosis is crucial for neural function. We use structure determination at atomic resolution and reconstitution approaches, in combination with electrophysiological studies performed by our collaborators Christian Rosenmund and Thomas Südhof, to elucidate the mechanism of release and how release is regulated during presynaptic plasticity processes that underlie diverse forms of information processing in the brain. Our research has allowed us to reconstitute basic steps of synaptic vesicle fusion with eight central proteins of the release machinery, leading to a model whereby: i) the SNARE proteins synaptobrevin, syntaxin-1 and SNAP-25 form tight complexes that bridge the vesicle and plasma membranes and are key for membrane fusion; ii) NSF and SNAPs disassemble SNARE complexes to disrupt off-pathway intermediates and recycle the SNAREs for another round of fusion; iii) Munc18-1 forms a template to orchestrate SNARE complex assembly together with Munc13s; and iv) Synaptotagmin-1 acts as the major Ca^{2+} sensor, cooperating with the SNAREs in inducing membrane fusion. Our most recent data suggest that autoinhibitory interactions within the release machinery are critical to enable the exquisite regulation of neurotransmitter release.

Location: **Auditorium**,
Charité – Universitätsmedizin Berlin, Campus Mitte
Virchowweg 6, Level 1, CCO

Date: **Thursday, July 13th, 5 p.m.**

Host: Marcial Camacho-Perez, Christian Rosenmund