Institute of Molecular and Cell Biology
A*STAR

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by Dr. John Chua:

Date: 15 January 2019, Tuesday
Time: 11:00AM – 12:00PM
Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Prof. Reinhard Jahn, Director, Department of Neurobiology, Max-Planck-Institute for Biophysical Chemistry, Germany
Title: Uptake and storage of glutamate and GABA by synaptic vesicles

Signaling between neurons is mediated by neurotransmitters that are released by exocytosis of synaptic vesicles upon stimulation. To maintain effective transmission over time, synaptic vesicles are rapidly recycled within nerve terminals and re-filled with transmitters by the action of vesicular neurotransmitter transporters. These transporters draw on an electrochemical proton gradient generated by a vacuolar ATPase. Unlike transporters at the plasma membrane, the ion and solute content of the vesicle interior changes dramatically during transport. Furthermore, charge and osmotic balance need to be maintained during transport, particularly when considering that thousands of uncharged (GABA, glycine) or charged (glutamate, monoamines) transmitter molecules must be translocated within seconds while only 50 charges will result in a membrane potential of 100 mV. Here we have used reconstitution of purified transporters in artificial vesicles, newly developed hybrid vesicles in which native synaptic vesicles were fused with liposomes of defined content, and single vesicle imaging to shed light on the transport mechanisms of glutamate and GABA. Our results show that the transporters cope with the challenge by influencing the driving force and by flexible adapting their transport mode during vesicle filling.

Biography:
Reinhard Jahn studied biology and chemistry at the Universities of Freiburg and Göttingen (doctorate in 1981). He was postdoctoral fellow at Yale and Rockefeller University (1983-1985), and assistant professor at Rockefeller University (1985-1986). Between 1986 and 1991 he was junior research group leader at the Max Planck Institute of Psychiatry in Munich. 1991 he moved to Yale University as associate/full professor for pharmacology and cell biology and as investigator of the Howard Hughes Medical Institute. In 1997 he became Director at the Max Planck Institute for Biophysical Chemistry. He has obtained several awards including the Leibniz-Prize (2000), the Ernst Jung Prize for Medicine (2006), the Sir Bernhard Katz Award (2008), the Heinrich Wieland Prize (2014) and the Balzan Prize (2016). Elected Memberships include the European Molecular Biology Organization (EMBO), the German National Academy Leopoldina, the Academia Europaea, and the National Academy of Sciences of the United States of America.

ALL ARE WELCOME *(No registration required)*

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