



## Institute colloquium

# The Institute Colloquium: Signal transduction in single dendritic spines

**Ryohei Yasuda**

Max Planck Florida Institute for Neuroscience

Host:

Activity-dependent changes in synaptic strength and structure are believed to be cellular basis of learning and memory. A cascade of biochemical reaction in dendritic spines, tiny postsynaptic compartments emanating from dendritic surface, underlies diverse forms of synaptic plasticity. The reaction in dendritic spines is mediated via signaling networks consist of hundreds of species of proteins. We have developed unique optical techniques to elucidate the operation principles of such signaling networks. First, based on 2-photon fluorescence lifetime imaging and highly sensitive biosensors, we have developed techniques to image signaling activity in single dendritic spines. We have succeeded in monitoring activity of several key signaling proteins in single spines undergoing structural and functional plasticity. This provided new insights into how the spatiotemporal dynamics of signaling are organized during synaptic plasticity. We have developed sensitive and specific sensors for CaMKI, CaMKII, Rho GTPase proteins, Rab GTPase proteins, protein kinase C isozymes (? , ? , ? etc) and a BDNF receptor TrkB. By monitoring signaling components with high spatiotemporal resolution, we expect to reveal the mechanisms underlying the spatiotemporal regulation of signaling dynamics underlying synaptic plasticity and learning and memory.

**Monday, October 17, 2016 04:00pm - 05:15pm**

Raiffeisen Lecture Hall, Central Building



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

Please find a schedule of the ISTA Shuttle on our webpage:

<https://ista.ac.at/en/campus/how-to-get-here/> The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.