DISTINGUISHED GUEST SEMINAR SERIES

Institute of Experimental Medicine, CAS

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Turquoise seminar room of the IEM CAS

Dear colleagues, it is our pleasure to invite you to this special guest seminar

New lights on neurotransmission: from molecular optogenetics to excitatory glycine receptors

Pierre Paoletti

Institute of Biology of the ENS (IBENS), Paris

ENS-PSL, CNRS, INSERM

The function of the human brain and its remarkable capacity for information storage and experience-dependent change hinge on the dynamics of chemical synapses – main 'contact points' between neurons. My team has a long-standing interest in studying the molecular principles underpinning the structure and function of chemical synapses. Our research focuses primarily on glutamatergic synapses and ionotropic glutamate receptors (iGluRs), ion channel receptors that provide the bulk of excitatory neurotransmission in the CNS and that are essential mediators of synaptic plasticity. Recent years have witnessed major progress in our understanding of the structure, mechanisms and regulation of iGluRs, with highlights including the decoding of full-length receptor atomic structures and the identification of human iGluR genes as major risk factors for neuropsychiatric disorders. In this talk, I will present recent studies from our team covering various aspects of iGluR biology, with a special focus on NMDA receptors (NMDARs). Topics will include allosteric mechanisms, synaptic microenvironment, optogenetic pharmacology and novel types of neuronal NMDARs insensitive to glutamate but gated by glycine. Our approach is multiscale and bridge fields ranging from molecular and cellular neuroscience to protein engineering, synaptic physiology and behavior. Our work opens new vistas on the diversity and complexity of iGluR signaling and of neurotransmission in general, with potential implications in precision drug development.

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