

# Synapses: From Molecules to Circuits and Behavior

## Session 1 CHANNEL, TRANSPORTER AND RECEPTOR FUNCTION

WEDNESDAY 4/18/2007, 7:30 PM

D. Bergles / A. Triller

#	<u>Iname</u>	<u>Title</u>	<u>Talk Length</u>
1	Triller	Itinerant receptors and dynamic organization of the synapse	15
3	Hoffman	Regulation of dendritic excitability by activity-dependent trafficking of the voltage-gated K <sup>+</sup> channel subunit Kv4.2 in hippocampal neurons	15
4	Popescu	Two NMDA receptor functions can be controlled separately by allosteric modulators	15
5	Yao	Inhibition of the dopamine D1 receptor signaling by PSD-95	15
6	Khodakhah	Why you need a good clock to walk!	15
7	Bergles	Functional analysis of cerebellar compartmentation	15

## Session 2 SYNAPTIC FUNCTION

THURSDAY 4/19/2007, 9:00 AM

C. McBain

#	<u>Iname</u>	<u>Title</u>	<u>Talk Length</u>
8	McBain	State-dependent plasticity of feedforward inhibition in the hippocampal mossy fiber pathway	15
9	Zucker	Dance of the snares—Assembly and rearrangements at neuronal synapses	15
10	Swanwick	Synaptic trafficking of NMDA receptors is modulated by Flotillin-1, a lipid raft-associated protein	15
11	Lee	Phospholipase D2 regulates dendritic spine morphogenesis and synaptic activity	15
12	Kim	Presynaptic Ca <sup>2+</sup> buffers control the strength of a fast post-tetanic hyperpolarization mediated by the $\alpha 3$ Na <sup>+</sup> /K <sup>+</sup> -ATPase	15
13	Emtage	MAGI-1 modulates behavioral plasticity and glutamate receptor synaptic localization	15

## Session 3 POSTER SESSION

THURSDAY 4/19/2007, 2:00 PM

#	<u>Iname</u>	<u>Title</u>	<u>Talk Length</u>
14	Bykhovskaia	Synapsin regulates the cross-talk between recycling and reserve vesicle pools in <i>Drosophila</i> presynaptic boutons	
15	Al-Hallaq	NMDA di-heteromeric receptor populations and associated proteins in rat hippocampus	
16	Amano	Neurotensin receptor type-1 suppresses the long-term potentiation in the basolateral nucleus of amygdala through the modulation of dopamine D <sub>2</sub> receptor	
17	Stein	Clc-2 mediates a chloride conductance in hippocampal CA1 neurons	
18	Barhwal	Normobaric hypoxia induced mitochondria mediated cell death in primary hippocampal culture	

19	Blundell	Learning induced GluR1 phosphorylation at hippocampal synapses resembles that induced by LTP
20	Borisova	Glutamate transport and exocytosis after membrane cholesterol depletion in synaptosomes
21	Burgalossi	The role of $\beta$ -SNAP in synaptic vesicle exocytosis
22	Chen	Molecular mechanisms of functional assembly of GABAergic synapses
23	Cho	Experimental and computational studies of short-term synaptic plasticity
24	Atasoy	Activity-dependent validation of excitatory vs. inhibitory synapse formation by neuroligin-1 vs. neuroligin-2
25	Cokic	Stargazin modulates the pharmacology of AMPA receptors antagonists
26	Cline	Development of GABAergic neurons in the <i>X. laevis</i> tadpole retinotectal system
27	Dan	Imaging synaptic structure in adult <i>Drosophila</i> brain
28	Davidkova	Characterization of the interaction between MAP1B and GRIP1 in hippocampus and its role in regulated endocytosis of AMPA receptors
29	Dickins	Wnt mediated synaptogenesis in the hippocampus
30	Ding	An SCR complex facilitates synaptic specificity by promoting synapse elimination in <i>C. elegans</i>
31	Ewald	The role of NMDA receptor subtypes in the development of dendritic arbor morphology
32	Fernandez-Busnadiego	Molecular architecture of the presynaptic compartment studied by cryoelectron tomography
33	Fu	Activity dependent morphogenesis of inhibitory synapse—Role of GAD67-mediated GABA synthesis and signaling
34	Gaudry	Behavioral choice by presynaptic inhibition of tactile sensory afferent terminals
36	Dunaevsky	Dendritic spine changes with learning-induced plasticity
37	Ikeda	Estimating the glutamate concentration in synaptic vesicles in the hippocampal cultures
38	Jabs	Do ionotropic ATP receptors contribute to the signaling at neuron-glia-synapses of the hippocampal CA1 subfield?
39	Jonas	BCL-xL improves neuronal metabolism and activates a DRP-1-clathrin complex during synapse maturation
40	Kalashnikova	SynDIG1—A novel postsynaptic transmembrane protein that regulates synapse development
41	Kumar	<i>Drosophila</i> syndapin promotes subsynaptic reticulum formation but is dispensable for synaptic vesicle recycling
42	Cline	Serial EM analysis of optic tectal cell morphology reveals changes in afferent convergence correlated with synapse maturation
43	Liebl	Derailed regulates development of the <i>Drosophila</i> neuromuscular junction
44	Lin	The neurofibromin-PKA-Ena-VASP pathway downstream of syndecan-2 is required for the initiation of dendritic spine formation in cultured hippocampal neurons
45	Lohmann	Role of dendritic filopodia in selecting presynaptic partners during development

46	Maro	Coordinated development of a motor unit—Matching of neurotransmitter and receptor, and assembly of synapses
47	Matsuo	Imaging of AMPA receptor dynamics in behaviorally activated neurons
48	Menon	Translational control mechanisms at the larval neuromuscular junction in <i>Drosophila</i>
49	Mok	Activation of M <sub>1</sub> muscarinic receptors enhances NMDAR function—In vivo and in vitro findings
50	Paukert	Functional analysis of cerebellar compartmentation
51	Varoqueaux	Functional specificity and structural interactions of neuroligins at the inhibitory synapse
52	Nasi	MicroRNA profiling following NGF treatment of PC12 cells
53	Sakurai	Analysis of knockout mice of the AGC1 gene, an autism susceptibility gene
54	Shi	The regulation of dendritic spine development and plasticity in cultured hippocampal neurons via integrins, EphB receptors and focal adhesion kinase
55	Sigrist	The Bruchpilot protein in the assembly of synapse structure and function
56	Sotirakis	Regulation of neuritogenesis—VARP targets TI-VAMP to the growth cone in a Rab21-dependent manner
57	Stankewich	Differential effects of βI vs. βII spectrin on dendritic spine and PSD morphology in hippocampal cultures
58	Sung	Calcium/calmodulin kinases link calcium and depolarization to norepinephrine transporter surface trafficking and norepinephrine clearance
59	Todd	Weakening electrical synapses during development diminishes chemical synaptic strength
60	VanHoven	Pre- and postsynaptic localization of the neuroligin ortholog NLG-1 in <i>C. elegans</i>

**Session 4 SYNAPSE STRUCTURE AND FUNCTION**

THURSDAY 4/19/2007, 7:30 PM

C. Aoki / M. Ehlers

<b>#</b>	<b><u>Iname</u></b>	<b><u>Title</u></b>	<b><u>Talk Length</u></b>
62	Aoki	Diversity of excitatory synapses in the amygdala, hippocampus and cortex of intact brain	15
63	Poon	Targeting of presynaptic components in the motor neuron DA9 in <i>C. elegans</i>	15
64	Li	<i>D. neurexin</i> controls synaptic bouton growth and regulates synaptic structure and function	15
65	Gollan	Cytoplasmic splicing of the neuronal receptor Neurexin-1 mRNA	15
66	Rudenko	Neurexins—Synaptic building blocks	15
67	Poulopoulos	Neuroligins interact with the inhibitory scaffolding protein Gephyrin	15
68	Ehlers	Submicron diffusional trapping of postsynaptic receptors at single activated synapses	15

**Session 5 SYNAPSE DEVELOPMENT**

FRIDAY 4/20/2007, 9:00 AM

A. Ghosh / Y. Jin

<b>#</b>	<b><u>Iname</u></b>	<b><u>Title</u></b>	<b><u>Talk Length</u></b>
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69	Jin	The roles of endosomes in presynaptic differentiation	15
70	Colon-Ramos	The immunoglobulin superfamily protein UNC-40/DCC directs synaptic targeting during circuit formation	15
71	Sun	Somewhere over molecular control of synaptogenesis, mechanical force acts as a signal	15
72	Rosenberg	Adenomatous polyposis coli protein coordinates assembly of a multi-protein postsynaptic complex in cholinergic neurons	15
73	Williams	The emergence of synaptic specificity in a developing neural circuit	15
74	Beg	$\alpha$ 2-chimaerin is an essential downstream mediator of EphA4 signaling	15
75	McClelland	Ephrin-B1 and ephrin-B3 act independently to control pre-versus postsynaptic development	15
76	Segura	Grb4 and GIT1 transduce ephrinB reverse signals modulating spine morphogenesis and synapse formation	15

**Session 6 NEURONAL PLASTICITY**

FRIDAY 4/20/2007, 2:00 PM

R. Nicoll / G. Turrigiano

<u>#</u>	<u>Iname</u>	<u>Title</u>	<u>Talk Length</u>
77	Turrigiano	Synaptic scaling is induced by postsynaptic firing	15
78	Huang	Actin polymerization is required for ERK phosphorylation and ARC mRNA targeting to activated synaptic sites during LTP	15
79	Zhong	Dendritically localized PKA translocates to synapse upon activation	15
80	Nishiyama	GABAergic regulation of spike-timing dependent synaptic plasticity in CA1 pyramidal cells	15
81	Li	The neuregulin1 receptor erbB4 controls glutamatergic synapse maturation and plasticity	15
82	Frank	The rapid induction and sustained expression of synaptic homeostasis—Molecules and mechanisms	15
83	Franke	Substrates for Akt-dependent learning & synaptic plasticity	15
84	Nicoll	Rapid bidirectional switching of synaptic NMDA receptors	15

**KEYNOTE SPEAKERS**

FRIDAY 4/20/2007, 7:30 PM

Catherine Dulac

Lily Jan

**Session 7 SYNAPTIC CIRCUITS**

SATURDAY 4/21/2007, 9:00 AM

W. Kristan

<u>#</u>	<u>Iname</u>	<u>Title</u>	<u>Talk Length</u>
85	Karpova	Dopamine-dependent development of primary sensory circuitry	15
86	Kristan	Interactions between electrical and inhibitory chemical synaptic connections in the embryogenesis of a leech behavioral circuit	15
87	Aizenman	Spike-timing dependent modification of recurrent excitation in the developing visual system	15
88	Wang	In vivo two-photon imaging reveals a role of Arc in enhancing orientation specificity in visual cortex	15
89	Colonnese	Ontogeny of intrinsic activity patterns in visual cortex	15

90	Chiang	Maintenance of sensory terminals in the adult <i>Drosophila</i> antennal lobe depends on neural activity	15
	Turner	Title only: Coding sensory inputs in the <i>Drosophila</i> olfactory system	15

**Session 8 SYNAPTIC PLASTICITY AND BEHAVIOR**

SATURDAY 4/21/2007, 2:00 PM

R. Hen / M. Wilson

<u>#</u>	<u>Iname</u>	<u>Title</u>	<u>Talk Length</u>
91	Hen	Neurogenesis and depression	15
92	Sakamoto	GABA receptors in the deep cerebellar nuclei are essential for mouse eyeblink conditioning	15
93	Sacktor	PKM $\zeta$ LTP maintenance, and long-term memory storage	15
94	Mozer	A neuroligin is required for associative learning in <i>Drosophila</i>	15
95	Lyons	The circadian clock inhibits learning-induced transcription at night in diurnal animals	15
96	Luscher	GABAergic control of adult hippocampal neurogenesis in relation to behavior indicative of trait anxiety and depression states	15
97	Miyakawa	Alpha-CaMKII deficiency causes dysregulated behaviors and immature dentate gyrus	15
98	Wilson	Hippocampal memory formation and reactivation	15

**Session 9 DISEASES OF SYNAPSES AND CIRCUITS**

SUNDAY 4/22/2007, 9:00 AM

M. Greenberg / J. Shen

<u>#</u>	<u>Iname</u>	<u>Title</u>	<u>Talk Length</u>
99	Shen	Presenilins in synaptic plasticity and neuronal survival	15
100	Powell	Neuroligin deletion results in autism and mental retardation-related behavioral abnormalities	15
101	Lee	Abnormal synaptic transmission and plasticity in beta-site amyloid precursor protein cleavage enzyme 1 (BACE1) knockout mice	15
102	Kuzhikandathil	D3 dopamine receptor signaling properties—Mechanisms and functional consequences	15
103	Walter	The computational power of cerebellar Purkinje cells	15
104	Chandra	CSP $\alpha$ and $\alpha$ -synuclein cooperate in preventing neurodegeneration	15
105	Gerber	Physiologic culture of cerebellar granule cells—Evidence supporting their use as a model for synaptic development and excitotoxicity	15