



ERIC GOUAUX, PH.D.

MECHANISMS OF SIGNAL TRANSDUCTION AND CLEARANCE
AT THE CHEMICAL SYNAPSES OF THE BRAIN

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4:00 P.M.

208 LIGHT HALL



Upcoming Discovery Lecture:

ERIC R. KANDEL, M.D.

*University Professor and Fred Kavli Professor,
Department of Neuroscience Columbia University*

May 4, 2017

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MECHANISMS OF SIGNAL TRANSDUCTION AND CLEARANCE AT THE CHEMICAL SYNAPSES OF THE BRAIN

The work in the Gouaux Lab is concentrated on developing molecular mechanisms for the function of receptors and transporters at chemical synapses. At chemical synapses, neurotransmitters released from one neuron diffuse throughout a small space—the synaptic cleft—to receptors on adjacent neurons. At many synapses, the neurotransmitter binds to a receptor that is a ligand-gated ion channel, and this binding event leads to the opening of a transmembrane pore, which in turn results in depolarization of the nerve cell and generation of an electrical signal. Neurotransmitter transporters surrounding the synapse clear the transmitters from the cleft by coupling the thermodynamically unfavorable uptake to the favorable co-transport of one or more sodium ions.

Glutamate, glycine and the biogenic amines are neurotransmitters of particular significance and currently we are focused on elucidating molecular structures to inform mechanisms by which these macromolecules transduce neurotransmitter binding to the opening of an ion channel and how the neurotransmitter transporters clear the transmitters from the synaptic spaces. While our primary tools for structure determination are cryo-electron microscopy and x-ray crystallography, we also utilize electrophysiology as well as other biophysical and biochemical methods to probe relationships between structure and mechanism.



ERIC GOUAUX, PH.D.

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CHAIR IN NEUROSCIENCE RESEARCH

INVESTIGATOR, HHMI

After receiving his B.A. and Ph.D. degrees in Chemistry at Harvard University, Eric Gouaux did his postdoctoral studies at Harvard and at the Massachusetts Institute of Technology. He began his professional career at the University of Chicago, then moved to Columbia University in 1996. In 2000, he was appointed associate professor at Columbia University, reaching full professor the following year. In 2005, he moved to Oregon Health & Science University as a Senior Scientist at the Vollum Institute, and in 2006 he was appointed to the graduate faculty in the Department of Biochemistry and Molecular Biology. In 2015, Gouaux was appointed the Jennifer and Bernard Lacroute Term Chair in Neuroscience Research. Dr. Gouaux has also had an appointment as an Investigator with the Howard Hughes Medical Institute since 2000.
