



## ***The BERNICE GRAFSTEIN LECTURE***

Sponsored by the Department of Physiology &  
Biophysics of WCMC and the Graduate  
Program in Neuroscience

given as part of the  
**PROGRESS IN NEUROSCIENCE SERIES**

Seminar Series of the  
Brain & Mind Research Institute  
Weill Cornell Medical College (WCMC)

Thursday, 1/14/16, 4 PM, coffee at 3:45 PM  
**WEILL AUDITORIUM**

***Cocktail Reception in Griffis Faculty Club to follow, 5:15 PM***

### **"Molecular mechanism of glutamate transporters"**

Olga Boudker, Ph.D.

Professor of Physiology and Biophysics  
Weill Cornell Medicine, HHMI Investigator



#### **Abstract:**



Glutamate transporters are responsible for clearance of the neurotransmitter glutamate from the synaptic cleft following rounds of neurotransmission. They maintain steep concentration gradients of glutamate by coupling its uptake to symport of sodium ions and protons and to antiport of potassium ions. We have been investigating the molecular mechanism of this family of transporters using an archaeal homologue GltPh as a model system. For GltPh, we not only obtained the crystal structures of key states along the transport cycle, but also probed the dynamics and thermodynamics that define the rates of substrate uptake and the mechanism of coupling the uptake to movements of ions.

#### **Recent relevant publications:**

- 1) Reyes, N., Ginter, C., Boudker, O. (2009) Transport mechanism of a bacterial homologue of glutamate transporters. *Nature* 462: 880-885
- 2) Verdon, G.\*, Oh, SeCheol, Serio, R., Boudker, O.\* (2014) Coupled ion binding and structural transitions along the transport cycle of glutamate transporters. *eLife* May 19; 3:e02283
- 3) Akyuz, N., Georgieva, E. R., Zhou, Z., Altman, R. B., Cuendet, M. A., Khelashvili, G., Stolzenberg, S., Terry, D. S., Freed, J. H., Weinstein, H., Boudker, O.\*, Blanchard, S.C.\* (2015) Transport domain motions in a glutamate transporter homologue determine turnover rate. *Nature*, 518: 68-73



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