



## **CHRISTOPHER VAAGA**

Oregon Health & Science University, Neuroscience Graduate Program

### **Degrees:**

B.S. Neurobiology with Distinction, University of Washington

### **Scholar Donors:**

Cyndy and Ed Maletis

### **About the Scholar:**

Chris' research is aimed at understanding how a population of dopaminergic interneurons within the olfactory bulb, the first cortical region devoted to processing smell, modulate early olfactory processing. Chris is interested in this population of neurons in part because they have the ability to release both dopamine, a classic neuromodulator, as well as GABA, a fast inhibitory neurotransmitter. The exact mechanisms underlying the differential release of dopamine and GABA are poorly understood, and may have important implications in how the olfactory bulb initially processes incoming olfactory inputs.

### **Benefits to Society:**

A variety of neurodegenerative diseases, including Parkinson's disease, have robust olfactory deficits that often can precede the onset of more severe deficits. The olfactory deficits seen in Parkinson's disease are accompanied by a doubling of the number of dopaminergic interneurons in the olfactory bulb. By understanding how these neurons function to modulate olfactory processing, we can better understand the nature of olfactory deficits in patients with Parkinson's disease. Ultimately, this could lead to the development of more sensitive olfactory tests to help doctors diagnose Parkinson's disease at earlier time points, prior to the onset of severe motor dysfunction.

### **Awards and Honors:**

National Science Foundation Graduate Research Fellow (2011-present)

Phi Beta Kappa, Washington Alpha Chapter (2010-present)

Mary Gates Research Scholar (2010)

Howard Hughes Medical Institute Research Apprentice (2008)

University of Washington Annual Dean's List (2006-2007; 2008-2009)

### **Publications and Posters:**

**Vaaga, C.E.**, Tovar K.R., Westbrook G.L. (2013) Gly-Pro-Glu tripeptide is a weak N-methyl D-Aspartate (NMDA) receptor agonist. *In preparation*.

**Vaaga, C.E.** (2010) Expression of a potassium-chloride co-transporter (KCC2) within the song system of *Taeniopygia guttata*. Undergraduate Thesis, University of Washington.

**Vaaga C.E.** (2008) Transmitter control of effector reactions in *Pleurobrachia bachei*. Program Thesis, UW Friday Harbor Laboratory HHMI Apprenticeship

**Vaaga C.E.**, Tovar K.R., Westbrook G.L. (2013) Gly-Pro-Glu tripeptide is a weak N-methyl D-aspartate (NMDA) receptor agonist. *Oregon Health and Science University Research Week Poster Session*.

**Vaaga, C.E.**, Tovar K.R., Westbrook G.L. (2012) Biological Effect of Gly-Pro-Glu tripeptide on N-methyl D-aspartate (NMDA) Receptors. *Neuroscience Graduate Program Retreat Poster Session*.

**Vaaga, C.E.**, Bodor A.L., Perkel D.J. (2010) Expression of KCC2 within Area X: A birdsong nucleus required for motor learning. *Undergraduate Research Symposium Poster Session A*.