

# Joel P. Baumgart

University of Virginia  
Department of Pharmacology  
P.O. Box 800735, Jordan Hall, room 5056  
Charlottesville, Virginia 22903

100 Oakhurst Circle  
Apt. G1  
Charlottesville, Virginia 22903  
(434) 249-4315 [jpb3f@virginia.edu](mailto:jpb3f@virginia.edu)

## Education

Doctor of Philosophy – Neuroscience, expected August 2008  
University of Virginia, Charlottesville, Virginia

Bachelor of Science – Biochemistry, 1999  
University of Missouri, Columbia, Missouri

Bachelor of Arts – Psychology, 1998  
University of Missouri, Columbia, Missouri

## Dissertation

Structural Determinants in the Gating and Surface Expression of Low Voltage-activated Calcium Channels, mentored by Professor Edward Perez-Reyes, Ph.D.

## Research Experience

Department of Pharmacology

*Graduate Student*, Neuroscience Graduate Program, University of Virginia, 2002 – present  
Research on the role of structural determinants of voltage-gated calcium channels as well as the trafficking of AMPA receptors in the context of the field of learning and memory using electrophysiology, biochemistry, confocal microscopy, and molecular biology techniques under the mentorship of Professor Edward Perez-Reyes Ph.D.

Département de Physiologie

*Visiting Graduate Student*, Institut de Génomique Fonctionnelle, Université de Montpellier, Dec. 2007  
Developed luminometric techniques to assay surface vs. total expression of voltage-gated calcium channels, under the supervision of Prof. Philippe Lory Ph.D.

Undergraduate Research

*Biochemistry major*, University of Missouri, January 1999 to May 1999  
Design and completion of senior thesis research project. Established location of cytokinin oxidase within the maize kernel using spectrophotometric, FPLC and SDS gel techniques.

Alcohol, Health, and Behavior Project

*Psychology major*, University of Missouri, August 1994 to January 1995  
Compilation and assembly of data in longitudinal psychological study under the stewardship of Profs. Kenneth Sher Ph.D. and Mark Wood Ph.D.

**Scientific Research Grants and Funding Awards*****Active***

Pre-doctoral Fellowship

“Structural Analysis of Low Voltage-activated Calcium Channels Associated with Absence Seizures”

*Epilepsy Foundation: Research Council of the Epilepsy Foundation*

January 2008 – present

Total Direct Costs: \$21,000/year

Double Hoo Research Grant for Undergraduate-Graduate Cooperative Research

“The role of Single Nucleotide Polymorphisms in T-type calcium channel function and proposed role in Childhood Absence Epilepsy”

*The Center for Undergraduate Excellence, College and Graduate School of Arts & Sciences, U. of Virginia*

May 2006 – May 2008

Total Direct Costs: \$2,100

***Completed***

Award for Excellence in Scholarship in the Sciences &amp; Engineering

*Office of the Vice President for Research & Graduate Studies, University of Virginia*

February 2008

Award Amount: \$5,000

Sigma Xi Grant-in-Aid of Research

“Structural Determinants in the Gating and Surface Expression of Low Voltage-activated Calcium Channels”

*Sigma Xi Grant-in-Aid of Research Program*

November 2007 – December 2007

Total Direct Costs: \$1,000

**Research Interests**

Physiology &amp; pharmacology of ion channels

Molecular &amp; cellular mechanisms mediating ion channel modulation

Molecular &amp; cellular mechanisms of synaptic plasticity

Pathology and etiology of epilepsy

Neurobiology of nociception

**Procedural Expertise**

Whole cell patch clamp recording in heterologous systems

Confocal fluorescence imaging in neuronal cells

Pharmacology

Viral expression of ion channels in organotypic cultures

Primary neuronal and glial cell culture

Recombinant DNA, RNA, and protein analysis.

Western immunoblotting

Immunoprecipitation

Luminometry

### Peer-Reviewed Publications

1. Arias-Olguin, I., Vitko, I., Baumgart, J.P., Fortuna, M., Sokolova, S., Van Deusen, A., and Perez-Reyes, E. (2008) Structure-Function of the gating particle in the I-II loop of Ca<sub>v</sub>3.2 T-type Ca<sup>2+</sup> Channels **Journal of Biological Chemistry** 283: 8136-44.
2. Nelson, M.T., Kang, H.W., Van Deusen, A.L., Baumgart, J.P., Barrett, P.Q., Lee, J.H., Perez-Reyes, E., Shin, H.-S., and Todorovic, S.M. (2007) Molecular mechanisms of redox modulation of T-type calcium channels. **Journal of Neuroscience**. 27: 12577-12583.
3. Y. Qin\*, Y. Zhu\*, Joel P. Baumgart\*, Ruth L. Stornetta, Kenneth Seidenman, Volker Mack, Linda van Aelst, and J. Julius Zhu (2005). State-dependent Ras signaling and AMPA receptor trafficking. **Genes & Development**. 19: 2000-2015.  
\* equally contributing authors
4. Y. Zhu, D. Pak, Y. Qin, S. G. McCormack, M. J. Kim, Joel P. Baumgart, Vanisree Velamoor, Pavel Osten, Linda van Aelst, Morgan Sheng and J. Julius Zhu (2005). Rap2-JNK removes synaptic AMPA receptors during depotentiation. **Neuron**. 16, 905-16.
5. Mandell J.W., Manabe R., Horwitz A.F., and Baumgart J.P. (2002). Fluorescence Imaging of Mobility Shifts: An Expression Cloning Method for Identification of Cell Signaling Targets. **Laboratory Investigation** (cover article). 82, 1631-6.

### Book Chapters

**Joel P. Baumgart** and Edward Perez-Reyes. (2008) Molecular Biology of Voltage-Gated Calcium Channels. In: Davies, C. and Kew, J.N. (Ed.) *Structure and Function of Ion Channels*. 1st Edition, London: Oxford University Press.

**Professional Development** Ion Channel Physiology, 2008  
Cold Spring Harbor Laboratory, Cold Spring Harbor, New York

Analytical & Quantitative Light Microscopy, 2008  
Marine Biological Laboratory, Woods Hole, Massachusetts

7<sup>th</sup> Annual FRET Microscopy Workshop (audit)  
W.M. Keck Center for Cellular Imaging  
University of Virginia, Charlottesville, Virginia, March 4-8, 2008

National Graduate Student Research Festival, October 2007  
National Institute of Health (NIH), Bethesda, Maryland

Molecular Physiology of Membrane Transport and Cell Excitability, 2007  
The Physiological Society International Workshop, Yaremche, Ukraine