

CURRICULUM VITAE  
**Jamie Maguire**

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**RESEARCH INTERESTS**

- Impact of the endocrine system on synaptic transmission and ion channel physiology.
- Role of the endocrine system in synaptic plasticity and neuronal excitability.
- Physiological maintenance and pathological disruption of neuronal excitability.
- Patho-physiological underpinnings of neuro-psychiatric diseases with a focus on developing novel therapeutic strategies
- Application of electrophysiological, molecular, and behavioral approaches to understanding synaptic plasticity and neurological disease.

**TEACHING INTERESTS**

Neuroscience	Neuroanatomy
Human Physiology	Neurobiology
Neurobiology of Disease	Neurophysiology
Biophysics of Ion Channels	Neurotransmission and Synaptic Plasticity
Human Health and Disease	Drugs and Behavior
Human Anatomy	Developmental Neurobiology

**EDUCATION**

**Ph.D. in Neuroscience**, The George Washington University, Washington, DC. 2003  
Thesis: The Impact of Glutamate Signaling on Glioma Progression and Epileptogenesis

**B.S. in Neuroscience**, The University of Pittsburgh, Pittsburgh, PA. 1998

**B.A. in The History of Art and Architecture**, The University of Pittsburgh,  
Pittsburgh, PA. 1998

**RESEARCH EXPERIENCE**

**UNIVERSITY OF CALIFORNIA AT LOS ANGELES**, Department of Neurology Los Angeles, CA  
**Assistant Researcher**, 2003-2010

*Advisor: Prof. Istvan Mody*

*Focus: GABA<sub>A</sub>R plasticity by steroid hormones.*

- Described changes in GABAergic inhibition under conditions of altered steroid hormone levels
- Explored changes in synaptic transmission leading to hyperexcitability.
- Characterized a mouse model of postpartum mood disorders
- Investigated potential therapeutic targets for steroid hormone-associated neurological disorders
- Screened patients with premenstrual syndrome and premenstrual dysphoric disorder for novel single nucleotide polymorphisms (SNPs).

- Characterized the phenotype of a mouse model of Autosomal Dominant Nocturnal Frontal Lobe Epilepsy (ADNFLE).
- Developed, authored, and received funding for several grants, including an F32 NRSA Individual Fellowship Application, a postdoctoral fellowship from the Epilepsy Foundation of America, and a Named New Investigator Award and a Pilot and Feasibility Award from the Center for Neurobiology of Stress at UCLA.

**THE GEORGE WASHINGTON UNIVERSITY, Department of Pharmacology**

Washington, DC

***Predoctoral Researcher***

1999-2003

Advisor: **Dr. Margaret Sutherland**

*Focus:* Glutamate transport in a mouse model of tumor-associated epilepsy

- Developed a model of tumor-associated epilepsy
- Investigated the therapeutic potential of enhanced glutamate transport in tumor-associated epilepsy
- Investigated the impact of glutamate signaling in tumor progression and epileptogenesis
- Developed, authored, and received funding for a predoctoral fellowship from the Epilepsy Foundation of America.

**CLINICAL & INDUSTRY EXPERIENCE**

**NEUROSCIENCE EDUCATION INSTITUTE**

Carlsbad, CA

***Scientific Writer (part-time)***

2006

- Commissioned to write articles about hot-topic scientific findings or a summary of the current scientific literature.

**NEURONS R US INC.**

Los Angeles, CA

***Research Scientist (part-time)***

2006

- Employed in-vivo physiological screening of neuromodulatory compounds
- Assessing the effects of neuromodulatory compounds on long-term potentiation (LTP)

**TEACHING EXPERIENCE**

**Adjunct Faculty, Neuroanatomy, Course and Laboratory**

Arlington, VA

Physical Therapy Masters Program, Marymount University

2002-2003

- Presented lectures introducing the gross anatomy of the central nervous system, structures and functions of the CNS, and pathways.
- Prepared the experimental specimens and exercises for the neuroanatomy laboratory.
- Prepared written examinations for the lecture as well as examinations for the wet lab
- Prepared a case study for a semester project and subsequent discussion
- Developed and graded all projects, quizzes, and examinations

**Teaching Assistant, Neuroanatomy**

Washington, DC

Medical School Course, The George Washington University

2001-2003

- Guided and instructed students through the wet laboratory
- Prepared the experimental specimens and exercises for the neuroanatomy laboratory.
- Prepared questions for mid-term and final exams.
- Conducted review sessions and exam preparatory sessions

**Laboratory Training, Mody Lab, UCLA**

Los Angeles, CA

- Ravi Gumpta, undergraduate student, pre-Med

2003-present

- Shivani Sharma, undergraduate student, pre-Med
- Viktoriya Golovatscka, undergraduate student, Psychology
- Isabella Ferando, graduate student, Neurobiology
- Ben Huang, graduate student, Neuroscience IDP
- Scott Arno, graduate student, Neurobiology

Responsibilities included developing a related, yet independent and feasible research project for each student which could be completed in the training period and generate tangible results, technical training, as well as student scientific development.

## **RESEARCH SUPPORT**

Impact of Maternal Depression on Offspring Development

1/10 - 12/11

Principal Investigator: Jamie Maguire

Agency: **Charles Hood Foundation**

Type: Child Health Research Award

The goal of this proposal is to investigate the mechanism of the negative impact of maternal depression on offspring development.

Endogenous neurosteroid regulation of GABA<sub>A</sub>Rs.

9/08 - 9/09

Principal Investigator: Jamie Maguire

Agency: **Center for Neurobiology of Stress**

Type: Pilot and Feasibility Award

The goal of this proposal is to investigate the role of stress in the pathophysiology of postpartum mood disorders.

Endogenous neurosteroid regulation of GABA<sub>A</sub>Rs.

9/06 - 9/07

Principal Investigator: Jamie Maguire

Agency: **NIH**

Type: Postdoctoral

The goal of this research study is to investigate the regulation of GABA<sub>A</sub>Rs under pathological (stress) and physiological (pregnancy) conditions of elevated neurosteroid levels.

Changes in GABAergic inhibition During Pregnancy and Postpartum:

9/06 - 9/08

Relevance to Postpartum Depression

Agency: **Center for Neurobiology of Stress**

Type: Named New Investigator Award

The goal of this research study is to investigate the regulation of GABA<sub>A</sub>Rs during pregnancy and the postpartum period. This proposal aims to investigate changes in neuronal excitability associated with the postpartum period which may be linked to postpartum depression.

Dynamic Neurosteroid-Dependent Regulation of GABA<sub>A</sub> Receptors

9/05 - 9/06

Principal Investigator: Jamie Maguire

Agency: **Epilepsy Foundation**

Type: Postdoctoral

The goal of this proposal is to study the endogenous regulation of GABA<sub>A</sub> receptors over the estrous cycle of mice. This proposal focuses on investigating alterations in the structure and function of GABA<sub>A</sub>Rs correlated with fluctuations in neurosteroid levels over the estrous cycle of mice.

Neuroprotective potential of neurosteroids in epilepsy

7/04 - 7/05

Trainee: Jamie Maguire

Agency: **NIH – Training Program in Neural Repair**

Type: Postdoctoral

The goal of this research project was to investigate the neuroprotective potential of neurosteroids in epilepsy. The extent of cell death was analyzed during conditions of elevated neurosteroid levels, such as over the estrous cycle or as a result of exogenous steroid hormone treatment.

The Role of Glutamate Transport in Glioma-Induced Epileptogenesis

6/01 - 6/02

Principal Investigator: Jamie Maguire

Agency: **Epilepsy Foundation**

Type: Predoctoral

The goal of this research project is to study the role of glutamate transport in epileptogenesis. A transgenic mouse model of the glutamate transporter, EAAT2, overexpression is employed to investigate the impact of glutamate transport on neuronal excitability. The project will focus on brain tumor associated epileptogenesis using an *in vivo* glioma model.

### **HONORS**

Center for Neuroscience at the University of Pittsburgh (CNUP) Fellowship (6/98)  
President of the Institute for Biomedical Sciences Graduate Student Association (8/00-8/01)  
Selected Speaker: The George Washington University Research Forum (3/01)  
Selected Speaker: Society for Experimental Biological Medicine Research Forum (3/01)  
The George Washington University Research Forum – 1<sup>st</sup> place poster (3/02)  
Selected Speaker Society for Experimental Biological Medicine Research Forum (3/02)  
Recipient of the John F. Annegers Award from the Epilepsy Foundation (7/02)  
The George Washington University Research Forum – 1<sup>st</sup> place poster (3/03)  
Steroids in the Nervous System – poster winner (2/05)  
Investigator's Workshop poster presenter – AES meeting (12/05)  
Named New Investigator – Center for Neurobiology of Stress (9/06)  
Young Investigators Award – American Epilepsy Society (12/06)  
Investigator's Workshop poster presenter – AES meeting (12/06)  
Neurobiology of Stress Symposium – 1<sup>st</sup> place poster presentation (2/08)

### **INVITED TALKS AND PRESENTATIONS**

Invited Speaker – GABAergic Systems meeting, Cold Spring Harbor Laboratory (12/06)  
Invited Speaker – Inhibition in the CNS meeting, Gordon Research Conference (7/07)  
Invited Speaker – Neurobiology of Stress Symposium (2/08)  
Invited Speaker – Steroids in the Nervous System (2/09)  
Invited Speaker – AbCam Inhibition in Health and Disease Conference (10/09)  
Invited Speaker – Society for Neuroscience meeting (10/09)

### **AD HOC REVIEWER**

Grants: Medical Research Council

Journals: Journal of Cell. Physiology, Nature Neuroscience, Journal of Neuroscience, Epilepsia

## PROFESSIONAL ACTIVITIES

Co-Organizer, Steroids and the Nervous System, Torino, Italy

(upcoming 2/09)

## PEER REVIEWED PUBLICATIONS

1. Belelli, D., Harrison, N., **Maguire, J.**, Macdonald, R., Walker, M., and Cope, D. (2009) Extrasynaptic GABA<sub>A</sub> receptors: form, pharmacology, and function. **J Neurosci.** 29(41): 12757 – 12763.
2. **Maguire, J.L.**, Ferando, I., Simonsen, C., and Mody, I. (2009) Excitability changes related to GABA<sub>A</sub> receptor plasticity during pregnancy. **J Neurosci.** Jul 29;29(30):9592-601.
3. **Maguire, J.L.** and Mody, I. (2009) Steroid hormone fluctuations and GABA<sub>A</sub>R plasticity. **Psychoneuroendocrinology.** Jul 23. [Epub ahead of print].
4. **Maguire, J.L.** and Mody, I. (2008) GABA<sub>A</sub> Receptor Plasticity during Pregnancy: Relevance to Postpartum Depression **Neuron** 59(2): 207 – 213.
5. **Maguire, J.L.** and Mody, I. (2007) Neurosteroid Synthesis-Mediated Regulation of GABA<sub>A</sub> Receptors: Relevance to Ovarian Cycle and Stress. **J Neurosci.** 27(9):2155–2162.
3. **Maguire J**, Klaassen A, Glykys J, Labarca C, Mody I, Boulter J. (2006) Seizures and enhanced cortical GABAergic inhibition in two mouse models of human autosomal dominant nocturnal frontal lobe epilepsy. **Proc Natl Acad Sci USA.** 103(50):19152-19157.
4. **Maguire, J.L.**, Stell, B.M., Rafizadeh, M., and Mody, I. (2005) Ovarian cycle-linked changes in GABA<sub>A</sub> receptors mediating tonic inhibition alter seizure susceptibility and anxiety. **Nature Neurosci** Jun;8(6):797-804.
5. Hughes EG, **Maguire JL**, McMinn MT, Scholz RE, Sutherland ML. (2004) Loss of glial fibrillary acidic protein results in decreased glutamate transport and inhibition of PKA-induced EAAT2 cell surface trafficking. **Brain Res Mol Brain Res.** 124(2):114-23.
6. Wang, C., Nguyen, H.N., **Maguire, J.L.**, Bui, M.D., and Perry, D.C. (2002) Role on intracellular calcium stores in cell death from oxygen-glucose deprivation in a neuronal cell line. **Journal of Cerebral Blood Flow and Metabolism** 22(2):206-14.

## MOST RELEVANT PUBLICITY

**7/31/08**

NIH News press release

<http://www.nih.gov/news/health/jul2008/nimh-31.htm>

Yahoo News

[http://news.yahoo.com/s/hsn/20080731/hl\\_hsn/possiblecauseofpostpartumdepressionpinpointed](http://news.yahoo.com/s/hsn/20080731/hl_hsn/possiblecauseofpostpartumdepressionpinpointed)

Washington Post

<http://www.washingtonpost.com/wp-dyn/content/article/2008/07/30/AR2008073001483.html>

Science

<http://www.sciencemag.org/content/vol321/issue5890/r-samples.dtl#321/5890/751b>

The Scientist

<http://www.the-scientist.com/blog/display/54898/>

Science Daily

<http://www.sciencedaily.com/releases/2008/07/080730140613.htm>

Medicine Net

<http://www.medicinenet.com/script/main/art.asp?articlekey=91451>

Health Finder

<http://www.healthfinder.gov/news/newsstory.asp?docID=617940>

**5/19/05**

Discover Magazine

Fox News

<http://www.foxnews.com/story/0,2933,156703,00.html>

US News

<http://health.usnews.com/usnews/health/briefs/womenshealth/hb050519a.htm>

Epilepsy Action News

<http://www.epilepsy.org.uk/node/1054>

## RELEVANT COURSES

**Graduate Courses:** The George Washington University

Neuroanatomy  
Neurodevelopment

**Undergraduate Courses:** The University of Pittsburgh

Human Physiology  
Neuroscience  
Neurophysiology  
Drugs and Behavior  
Homeostasis  
Biochemistry

**HIGHLIGHTS OF TECHNICAL QUALIFICATIONS**

Whole-cell patch clamp recording  
Western blot  
Primary cell culture  
Tissue culture  
Immunoprecipitation  
Immunohistochemistry  
Cryostat sectioning  
Vibrotome sectioning  
Electrophysiological extracellular recording  
Hippocampal slice recording  
Animal handling  
Electroencephalogram (EEG) recording  
Protein isolation  
RNA isolation  
DNA isolation  
PCR  
Real-time PCR  
Sequencing  
Synaptosomal preparation  
Brain dissection  
Ca<sup>2+</sup> imaging  
DNA laddering  
Xenopus blastocyst injection  
Behavioral paradigms – open field, elevated plus maze, resident-intruder, Porsolt forced swim test, tail suspension test.