

ELYSSA B. MARGOLIS

Ernest Gallo Clinic & Research Center
5858 Horton St.
Suite #200
Phone: (510) 985-3925
Fax: (510) 985-3101
elyssam@gallo.ucsf.edu

EDUCATION

Ernest Gallo Clinic & Research Center, USCF, postdoctoral training 2004-2006
UCSF/UC Berkeley Joint Graduate Group in Bioengineering Ph.D. 2003

Major: Neuroscience

Minors: Transport, Drug Design

Harvey Mudd College, Engineering BS 1999,

Emphases: Chemical Engineering and Psychology

CURRENT RESEARCH

Assistant Research Scientist (January 2007 - present)

Postdoctoral Fellow (January 2004-December 2006)

Ernest Gallo Clinic and Research Center

Advisor: Howard L. Fields, M.D., Ph.D.

Research in Addiction Neuroscience investigating the characteristics of neurons sensitive to κ , μ , and δ opioid receptor agonists in the ventral tegmental area (VTA), a source of dopamine in the reward circuitry of the brain. Focus on determining the specific anatomical targets of opioid sensitive VTA neurons and finding a reliable technique for identifying dopaminergic neurons *in vitro*.

- *In vitro* whole cell electrophysiology
- Stereotaxic surgery
- Retrograde tracing of neurons in live animals
- Immunohistochemical methods including TH, GAD, and biocytin/avidin staining
- Confocal microscopy
- Laser capture tissue sampling
- Real time RT-PCR
- siRNA vector design

Doctoral Research

UCSF/UC Berkeley Joint Graduate Group in Bioengineering at the Ernest Gallo Clinic and Research Center (April 2000 – December 2003)

Advisor: Howard L. Fields, M.D., Ph.D.

Research in Addiction Neuroscience determined the effects of κ opioid receptor activation in the VTA. Contrasted these effects with those elicited by μ opioid agonists.

- *In vitro* whole cell electrophysiology
- Immunohistochemical methods including TH and biocytin staining
- Time and frequency analysis of spontaneous cell firing during recordings
- *In vivo* microdialysis of dopamine in awake animals

INVITED LECTURES and TALKS

INRC, Charleston, SC 2008
Albert Einstein College of Medicine of Yeshiva University, NY, NY 2007
Dopamine 50 Years Congress, Sweden, 2007
Workshop on Neurosystems, Stanford University, Stanford, CA 2007
National Institute of Drug Abuse, Baltimore, MD 2004

PUBLICATIONS: Papers

Margolis EB, Fields HL, Hjelmstad GO, Mitchell JM (2008) Delta opioid receptor expression in the ventral tegmental area protects against elevated alcohol consumption. *J Neurosci* 12672-12681.

Margolis EB, Mitchell JM, Ishikawa J, Hjelmstad GO, Fields HL (2008) Midbrain dopaminergic neurons: projection target determines action potential duration and dopamine D2 receptor inhibition. *J Neurosci* 28:8906-8913.

Fields HL, Hjelmstad GO, **Margolis EB**, Nicola SM (2007) Ventral tegmental area neurons in learned appetitive behavior and positive reinforcement *Annu Rev Neurosci* Mar 15

Margolis EB, Lock H, Hjelmstad GO, Fields HL (2006) The ventral tegmental area revisited: is there an electrophysiological marker for dopaminergic neurons? *J Physiol* Dec 15; 577(Pt 3):907-24.

Margolis EB, Lock H, Chefer VI, Shippenberg TS, Hjelmstad GO, Fields HL (2006) Kappa opioids selectively control dopaminergic neurons projecting to the prefrontal cortex. *Proc Natl Acad Sci U S A* Feb 21;103(8):2938-42.

Margolis EB, Hjelmstad GO, Bonci A, Fields HL (2005) Both kappa and mu opioid agonists inhibit glutamatergic input to ventral tegmental area neurons. *J Neurophysiol* 93:3086-3093.

Margolis EB, Hjelmstad GO, Bonci A, Fields HL (2003) Kappa-opioid agonists directly inhibit midbrain dopaminergic neurons. *J Neurosci* 23:9981-9986.

HONORS AND AWARDS

- Winner of the Women's Technology Cluster BioBiz VC competition (2003)
- Finalist in the Berkeley Business Plan Competition (2002)
- Wheeler Center for the Neurobiology of Addiction Research Grant (2001)
- Departmental Honors, Engineering Department, Harvey Mudd College (1999)
- Graduation with Distinction, Harvey Mudd College (1999)

ADDITIONAL RESEARCH EXPERIENCE

Research Rotation, UCSF/UC Berkeley Joint Graduate Group in Bioengineering (October 1999 – February 2000)

Advisor: Theodore E. Cohn, Ph.D.

UC Berkeley Vision Science Department. Designed and performed experiments testing threshold change light sensitivity in locust photoreceptors. Developed mathematical model of observations.

- *In vivo* intracellular electrophysiology
- Developed Monte Carlo modeling methods to simulate experimental results.
- Visual Basic programming of experimental procedure including noise and real time sensitivity analysis.

Engineering Clinic Project Team Leader, Harvey Mudd College (September 1998 – May 1999)

Academic Advisor: J. Richard Phillips, Ph.D., Harvey Mudd College

Industry Liaison: Marc Privitera, MS, Clorox Services Company

Project for Clorox Services Company. Developed theoretical model of metal ion removal in filtration system. Empirically determined more effective filtration method.

- Full filtration experimental design including parameter identification, test matrix optimization, and procedure standardization.
- Developed analytical techniques utilizing cyclic voltammetry to measure ppb concentrations of metal ions in standard solutions (for methodological verification) and bleach samples from the filtration experiments.
- As team leader, I was specifically responsible for all project management.

Research Intern, National Institutes of Health (Summer 1998)

Advisor: Jay Knutson, Ph.D.

Analyzed and modeled DNA protein fluorescence using least square non-linear regression fits and genetic algorithms. Developed data visualization software.

- Collaborated on statistical algorithms used to find best fit parameters for fluorescence data.
- Designed graphical user interface (Visual C++ on UNIX operating system) for the suite of data fit routines.
- Designed data visualization software optimized to effectively display the processed fluorescence data and to interface seamlessly with the suite of data fit routines.
- Updated, expanded (from 2 dimensions to 3 dimensions), and modified a genetic algorithm (Fortran 77) designed to determine optimal fitting parameters for balancing fit accuracy and data smoothing. Ran extensive testing with the algorithm to determine parameter limits for obtaining this desired balance.

Environmental Engineering Research Assistant, Harvey Mudd College (May 1997 – December 1997)

Advisor: Mary Cardenas, Ph.D.

Developed simulations of sediment transport and hydrodynamics of aquatic systems and sorption, convection, and diffusion in saturated soil systems.

- Wrote subroutines (Fortran 77) simulating 3 dimensional flow, secondary flow characteristics and centrifugal centripetal particle acceleration under curved flow conditions for the SEDZYL sediment transport and hydrodynamic modeling program.
- Verified these simulations by modeling experimental data from straight and annular laboratory flow configurations.
- Collaborated on algorithm development for 2-dimensional (space and time), convection, and diffusion model.
- Used the above model to determine the partition, diffusion, and transfer coefficients for various soil and contaminant systems tested at UCSB.

**Engineering Research Assistant, Harvey Mudd College
(January 1998 – May 1998)**

Developed data processing routines for optical coherence microscope (OCM).

- Built image processing routines using standard *AVS Express* modules.
- Wrote custom modules for *AVS Express* in order to take full advantage of the OCM's simultaneous detection of 3 dimensional tissue layers during image recovery and processing.

TEACHING AND MENTORING EXPERIENCE

Ernest Gallo Clinic & Research Center

Mentor to college summer research intern (2006)

The United Department of Labor Women's Bureau

Mentor, (2002)

Girls E-Mentoring in Science, Engineering, & Technology (GEM-SET) Program

UC Berkeley/UCSF Joint Graduate Group in Bioengineering

Peer Advisor, (Spring 2000, 2001)

Harvey Mudd College

Teaching Assistant, Department of Engineering

Introduction to Chemical Engineering (Spring 1998, 1999)

Chemical Reaction Engineering (Fall 1998)

Writing Center Consultant (September 1996 – May 1999)

Responsibilities included one on one non-directive tutoring in all writing genre and presentation styles and leading writing workshops.

Hudson River Park Conservancy

Environmental Supervisor (Summer 1996)

Responsibilities included designing and implementing an environmental awareness program consisting of scientific research and public educational activities completed on the Hudson River piers in Manhattan.

PROFESSIONAL MEMBERSHIPS AND CERTIFICATIONS

Society for Neuroscience, member (2001-present)

Board for Professional Engineers and Land Surveyors, state of CA, EIT Certification
(2000)

Society of Women Engineers member (1995-present), President (97-99), Secretary (96-97)
of Harvey Mudd College Section

SERVICE TO PROFESSIONAL PUBLICATIONS

Journal reviewer, *Journal of Neuroscience*, *European Journal of Neuroscience*

COMMITTEES AND LEADERSHIP POSITIONS

Representative to the Bioengineering Association of Students at UCB/UCSF (2003)

Organizer of the Bioengineering Research Forum at UCB/UCSF (2003)

Qualifying Exam Advisor for the UCSF/UC Berkeley Joint Graduate Group of
Bioengineering (2001-2002)

Berkeley Art Center web mistress (2001-present)

Empowering Women of Color Conference: committee member & web mistress
(2000-2002)

Head Peer Advisor for UCSF/UC Berkeley Joint Graduate Group in Bioengineering
(2000-2001)

Outdoors Event Coordinator for UCB/UCSF bioengineering graduate students (1999-2000)

SKILLS

Laboratory Techniques: Intracellular and whole cell electrophysiology, brain tissue immunohistochemistry, laser capture tissue sampling, real time RT-PCR, stereotaxic surgery, confocal and fluorescent microscopy

Operating Systems: UNIX, Windows 2000 and XP, Mac OS X

Programming Languages: C/C++, FORTRAN, UNIX Shell Scripts, Perl, Motif, HTML, Visual Basic, PHP

Software Packages: Mathematica, AVS Express, Microsoft Office, Matlab, Simulink, IGOR, MySQL, AxioVision, Adobe Creative Suite