

Curriculum Vitae

T.D. Barbara Nguyen-Vu

CURRENT POSITION:

Post-doctoral Fellow
Department of Neurobiology
Stanford University

EDUCATION

- 2006 – 2012 **Ph.D** Molecular Cell Physiology (Neuroscience)
Stanford University
- 2002 – 2005 **M.B.A.** emphasis in Management
San Jose State University
- 1998 – 2002 **B.A.** Molecular Cell Biology emphasis in Neurobiology
B.A. Economics
University of California at Berkeley

RESEARCH INTEREST

- Neural Basis of Learning and Synaptic Plasticity *in vivo*

PUBLICATIONS

Nguyen-Vu, T.D.B.; Kohli, A.; Zeng, H. Deisseroth, K.; Raymond, J.L.; “Cerebellar Purkinje cells play a dual role in motor control: motor performance and motor learning” *submitted*

Nguyen-Vu, T.D.B.*; Zhao, G.Q.*; Lee, H.M.; Shatz, C.J.; Raymond, J.L.; “A saturation model for impaired learning with enhanced plasticity.” *submitted*

Nguyen-Vu, T.D.B.*; Zhao, G.Q.*; Raymond, J.L.; “The role of MHC-I Kb and Db in learned timing of motor behavior.” *in preparation*

Nguyen-Vu, T.D.B. and Raymond, J.L.; “Infrared illumination influences eye movements in mice.” *in preparation*

Zhao, G.Q.*; **Nguyen-Vu, T.D.B.***; Shin, S.S.; Li, Y.L.; Tsien, R.; Barsh, G.; Raymond, J.L. “Signal degradation in the cerebellum selectively disrupts specific aspects of motor learning acquisition and retention.” *in preparation*

Cassell A.M.; Li J.; **Nguyen-Vu, T.D.B.**; Koehne, J.E.; Chen, H.; Andrews, R. Meyyappan, M.; “Vertically aligned carbon nanofibers; interconnecting solid state electronics with biosystems.” *J. Nanosci Nanotechnol.*; Vol. 9, No. 8, August 2009 pg.5038-46.

De Asis, E.D.; **Nguyen-Vu, T.D.B.**; Arumugam, P.U.; Chen, H.; Cassell, A.M. Andrews, R.J.; Yang, C.Y.; Li, J. “High efficient electrical stimulation of hippocampal slices with vertically aligned carbon nanofiber microbrush array.” *Biomed Microdevices.* Vol. 11, No. 4; March 2009 pg. 801-8.

Nguyen-Vu, T.D.B.; Chen, H.; Cassell, A.M.; Andrews, R.; Meyyappan, M.; Li, J. “Vertically-Aligned Carbon Nanofiber Architecture as a Multifunctional 3D Neural Electrical Interface.” *IEEE Transactions on Biomedical Engineering special issue Sensory Neural Prostheses.* Vol. 54, No. 6, June 2007. pg. 1121-8.

Nguyen-Vu, T.D.B.; Chen, H.; Cassell, A.M.; Andrews, R.; Meyyappan, M.; Li, J. “Vertically Aligned Carbon Nanofiber Arrays; an Advance toward Electrical-Neural Interfaces.” *Small.* Vol.2 Iss.1, 2006 pg. 89-94.

ACHIEVEMENTS

Oct. 2012

Molecular and Cellular Cognition Society 2012 Symposium Speaker

- Invited to give a talk at the SfN pre-meeting for the MCCS 2012 symposium. The selection was made based on the best abstracts submitted. The talk was titled, "Motor learning in mice deficient in H2-Db and H2-Kb classical MHC I molecules: a saturation hypothesis for impaired learning with enhanced plasticity."

Sept. 2012

Champalimaud Neuroscience Symposium 2012 Travel Award

- Selected as one of three awardees to receive a travel award in recognition of the best abstracts submitted among students and postdocs. The abstract is titled, "The activity of cerebellar Purkinje cells contributes to the induction of motor learning."

Sept. 2010 – 2012

Kirschstein Predoctoral National Research Service Award (NRSA)

- Individual predoctoral research training fellowship award to promising doctoral candidates who have the potential to become productive, independent investigators in research fields relevant to the missions of these participating NIH Institutes and Centers

Nov. 2010

Janelia Farm – Genetic Manipulation of Neuronal Activity II Meeting

- Selected as one of the few graduate students to attend and present at this bi-annual meeting. The meeting brings together leaders in the field of genetic tools for the exogenous control of neural circuit activity to review the progress of development and application of novel tools.

April 2007- 2010

National Science Foundation (NSF) Graduate Fellowship

- Merit fellowship for outstanding graduate students to become knowledge experts who can contribute significantly to research, teaching, and innovations in science and engineering. 3 year fellowship awarded based on intellectual merit and broader impact.

July 2007

Cold Spring Harbor – Biology of Memory Summer Course

- Chosen as graduate student participant in a bi-annual intensive course on the biology of memory. Course allowed unique opportunity for students to interact closely with many leading researchers in the field of learning and memory research.

Oct. 2006

NASA Ames Best First Paper Award

Moffett Field, CA

- Award recognizes the accomplishment of young scientists with the competition of best first author papers only.

Aug. 2004

NASA Ames Accelerated Training Program (ATP)

Moffett Field, CA

- ATP is an intense technical training and professional orientation program for new scientists eligible for accelerated promotion

Mar. 2004

NASA Ames Honor Awards

Washington, D.C.

- Integrated Financial Management Program Honor Award for extensive contribution to the NASA Agency Budget Formulation software development project

PRESENTATIONS

Nguyen-Vu, T.D.B.; Kohli, A.; Deisseroth, K.; Raymond, J.L. "The activity of cerebellar Purkinje cells contributes to the induction of motor learning." Society for Neuroscience Meeting, October 2012 and selected for travel award for Champalimaud Neuroscience Symposium, Lisbon, October 2012.

Nguyen-Vu, T.D.B.*; Zhao, G.Q.*; Lee, H.M.; Shatz, C.J.; Raymond, J.L.; "Mice deficient in H2-D^b and H2-Kb classical MHC I molecules: a saturation hypothesis for impaired learning with enhanced plasticity." Invited talk at Molecular and Cellular Cognition Society Meeting, October 2012.

Zhao, G.Q.*; **Nguyen-Vu, T.D.B.***; Shin, S.S.; Li, Y.L.; Tsien, R.; Barsh, G.; Raymond, J.L. "Signal degradation in the cerebellum selectively disrupts different aspects of motor learning." Society for Neuroscience Meeting, October 2012.

Nguyen-Vu, T.D.B.; Raymond, J.L. "Optogenetic stimulation of Purkinje cells to induce motor learning" Genetic Manipulation of Neuronal Activity II, Janelia Farm Research Campus, November 2010.

Nguyen-Vu, T.D.B.; Zhao, G.Q.; McConnell, M.J.; Huang, Y.; Shatz, C.J.; Raymond, J.L. "Class I MHC regulation of cerebellar LTD is required for normal motor learning in the vestibulo-ocular reflex." Society for Neuroscience Meeting, November 2008.

Zhao, G.Q.; **Nguyen-Vu, T.D.B.**; Raymond, J.L. "VOR gain and phase learning are differentially affected by inactivation of the cerebellar flocculus." Society for Neuroscience Meeting. November 2008.

Nguyen-Vu, T.D.B.; Katoh, A.; Raymond, J.L. "Infrared illumination influences eye movements in mice." Society for Neuroscience Meeting. November 2007.

Li, Jun.; **Nguyen-Vu, T.D.B.**; de Asis, E.; Chen, H.; Cassell, A.; Andrews, R. and Yang, C. "Vertically-Aligned Carbon Nanofiber Array as a 3D Multifunctional Material for Neural Electrical Interfaces." Material Research Society Spring Meeting. April 2007

Nguyen-Vu, T.D.B.; Chen, H.; Cassell, A.M.; Andrews, R.; Meyyappan, M.; Li, J. "Vertically-Aligned Carbon Nanofiber (VACNF) Array for 3D Neural Electrical Interface." NIH Neural Interfaces Workshop, Bethesda, Maryland. August 2006

Nguyen-Vu, T.D.B.; Chen, H.; Cassell, A.M.; Andrews, R.; Meyyappan, M.; Li, J. "Vertically Aligned Carbon Nanofiber in a versatile 3-D Electro-Biological Array." Material Research Society Spring Meeting, San Francisco, California. April 2006.

Li, J.; **Nguyen-Vu, T.D. B.**; Chen, H.; Cassell, A.; Koehne, J.; Arndrews, R.; Meyyappan, M. "Multiwalled Carbon Nanotubes: Interconnecting Solid-State Electronics with Biosystems." The International Conference on Bio-Nano-Informatics Fusion. Marina del Rey, California. 20 July 2005.

Nguyen-Vu, T. D.B.; Chen, H.; Cassell, A; Koehne, J.; Purewal, H.; Meyyappan, M.; Andrews, R.; Li, J. "Carbon Nanofibers Nanoelectrode Array for Closed-Loop Electrical Stimulation." International Functional Electrical Stimulation Conference Proceedings. 2005, pg. 213-215.

Nguyen-Vu, T.D.B.; Chen, H.; Cassell, A.; Koehne, J.; Purewal, H.; Ye, Q.; Meyyappan, M.; Andrews, R.; Li, J. "Carbon Nanotube Nanoelectrode Array for Electrophysiology." NIH Neural Interfaces Workshop. Bethesda, Maryland. 15 November 2004.

LAB EXPERIENCE

Feb. 2007- Current

Stanford Medical School – Neurobiology Department

Principal Investigator: Jennifer Raymond, PhD

Thesis Project: Dissecting the neural mechanisms of cerebellum-dependent learning: Enhanced Plasticity and Instructive Signals

- Using MHC H2-K^b/D^b knockout mutants with enhanced pf-LTD to understand how enhanced plasticity yields impaired learning.
- Using optogenetics to determine of sufficiency of Purkinje cell simple spike activity for the induction of motor learning of vestibular-ocular reflex (VOR).
- Using MIST (molecular inactivation of synaptic transmission) to understand the contribution of cortical plasticity in specific aspects of motor learning.

Rotation Project: Influence of infrared illumination on eye movements in mice

- Investigated the influence of infrared illumination of video tracking system on the VOR response in awake behaving mice.

Sept. 2006 – Jan. 2007

Stanford Medical School – Molecular Cell Physiology Department

Principal Investigator: Dan Madison, PhD

Rotation Project: Long-term depression (LTD) as a discrete synaptic state

- Evaluated whether LTD and depotentiation are distinct synaptic states using acute hippocampal brain slices.

April 2004 – Sept. 2006 **Center for Nanotechnology – Bio-nanotechnology Program - NASA Ames**
Mentors: Jun Li, PhD; M. Meyyappan, PhD; Harry Partridge, PhD

Project: Carbon Nanofiber Nanoelectrode for Neural Electrophysiology and DBS

- Led development of novel carbon nanofiber nanoelectrode platform as a multifunctional deep brain stimulation chip for therapeutic treatment of Parkinson's patients
- Examined electrochemical properties of nanoelectrode for *in vivo* detection of trace neurotransmitters
- Studied surface modification of the carbon nanotube to maximize charge delivery of stimulating electrode on neural tissue
- Investigated the feasibility of using carbon nanotube nanoelectrode for detecting neurotransmission responses *in vivo*

Project: Biocompatibility and Biofouling Modification of Substrates in Biosensors

- Developed the use of electrochemical substrate modification for investigation of biocompatibility
- Maximized biocompatibility of material for sustained use as an implantable device
- Extended understanding of surface coating for biological sensors in application for astrobiology

Project: Biosensor - Carbon Nanofiber Nanoarray for Rapid Label-free DNA Assay

- Functionalized carbon nanofiber nanoarrays for DNA detection
- Researched passivation mechanism for efficient DNA hybridization

Jan 2002 - May 2002 **Neuro-engineering Lab – NASA Ames**
Principal Investigators: Leonard Trejo, PhD and Leslie Montgomery PhD

Project: Near Real-Time Prediction of Human Performance from ERP

- Analyzed 64 electrode EEG data for ERP to elucidate patterns of mental fatigue

REFERENCES

Jennifer Raymond, PhD – Associate Professor

Department of Neurobiology, Stanford University

Carla Shatz, PhD – Professor, Director of Bio-X

Department of Biology and Neurobiology, Stanford University

Daniel V. Madison, PhD – Associate Professor

Department of Molecular & Cellular Physiology, Stanford University

Tirn Moore, PhD – Associate Professor

Department of Neurobiology, Stanford University

John Huguenard, PhD – Professor

Department of Neurology & Neurological Sciences, Stanford University