

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel in the order listed on Form Page 2.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME		POSITION TITLE	
Tania Q. Vu		Assistant Professor	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Carnegie Mellon University	B.S.	1988-1992	Electrical Engineering and Biomedical Engineering
University of California, Berkeley	Ph.D.	1992-1997	Visual Neuroscience
University of California, San Francisco	Postdoc	1998-1999	Retinal Neurophysiology
University of Illinois, Chicago	Postdoc	2001-2003	Micro/Nanotechnology and Neurophysiology
Boston University	Fellow	2003-2004	Micro/Nanotechnology

**A. Positions and Honors****Positions:**

1992-1997 **Doctoral Research**, The University of California, Berkeley  
 1998-1999 **Postdoctoral Fellow**, University of California, San Francisco  
 2001-2002 **Postdoctoral Fellow**, The University of Illinois, Chicago  
 2002-2003 **Instructor**, The University of Illinois, Chicago  
 2003-2004 **Senior Research Fellow (Faculty Status)**, Boston University  
 2005- **Assistant Professor**, Department of Biomedical Engineering, Oregon Health and Science University  
 2005- **Faculty Member**, Neurosciences Graduate Program, Oregon Health and Science University  
 2005- **Adjunct Faculty**, Dept of Physics, Portland State University

**Honors:**

1988-1992 Carnegie Mellon University Distinguished Scholars Award  
 1992 Society of Women Engineers Academic Recognition, Carnegie Mellon University  
 1992-1995 NIH Pre-doctoral Fellowship, University of California, Berkeley  
 1996 U.C. Berkeley Vision Science Block Grant Award  
 1997 Retinal Research Foundation Travel Fellowship Award  
 1999 United States Public Health Service Award (NRSA)  
 2007 Aspen Institute Fellow

**Invited talks (selected, last 36 months only)**

- NSF IGERT Symposium: Integrating Nanotechnology with Cell Biology and Neuroscience, University of New Mexico, 2008
- International Workshop on Molecular Diffusion in Neurons, Computational Neuroscience Society 2008

- Invitrogen, Eugene, OR 2007
- Micro Nano Breakthrough Conference, Portland, OR 2007
- OHSU Vollumn Institute Neuroscience Graduate Program Retreat 2007
- SPIE Biophotonics West, Quatum Dots and Cell Biology, San Jose, CA 2007
- Dept. of Physics, Portland State University 2006
- Cognitive Systems: Bridging Cellular to Social, Santa Fe 2006
- Nanotechnology and Neurology, Nanotec Conference, Boston MA 2006
- NY Academy of the Sciences, Nanotechnology Group, NYC 2006

### **Journal Reviewer:**

Nature Reviews Neuroscience; ACS Nano; Journal of American Chemical Society; IEEE Transactions in Nanobioscience; Journal of Biomedicine and Biotechnology; Journal of Biomaterials Research; Biosensors and Bioelectronics; Cellular and Molecular Life Sciences

## **B. Publications**

### **Journals:**

1. Liu HY and Vu TQ. Single Nanoparticle Quantum Dot Imaging Achieves the Ultimate Sensitivity Limit for Protein Gel Electrophoretic Blotting. **Nature Nanotechnology** (*in review*)
2. Sundara Rajan, S. and Vu TQ. Quantum Dot Intracellular Probes for Imaging Receptor Endocytic Trafficking. **ACS Nano** 2(6): 1153-1166, 2008.
3. Pattani VP, Li C, Desai TA, and Vu TQ. Microcontact Printing of Quantum Dot Bioconjugate Arrays For Localized Capture and Detection of Biomolecules", **Biomedical Microdevices**, 2008 Jun;10(3):367-74.
4. Zhang F, Ulrich, B, Reddy R, Venkatraman VL, Prasad S, Vu TQ, and Hsu, ST. Fabrication of Submicron IrO<sub>2</sub> Nanowire Array Biosensor Platform by Conventional Complementary Metal-Oxide-Semiconductor Process. **Japanese Journal of Applied Physics**, 47(2), 1147-1151, 2008.
5. Liu HY and Vu TQ. Identification of Quantum Dot Bioconjugates and Cellular Protein Co-localization by Hybrid Gel Blotting. **Nano Letters**, 7(4):1044-9, 2007.
6. Vu TQ, Sundara Rajan S, and Liu HY. Ligand Bound Quantum Dots for Intracellular Imaging of Neural Receptors. **Proceedings of SPIE**, Colloidal Quantum Dots for Biomedical Applications, Vol. 6448; 2007.
7. Sundara Rajan S and Vu TQ. Quantum Dots Monitor TrkA Receptor Dynamics in the Interior of Neural PC12 Cells. **Nano Letters** 6(9):2049-59, 2006.
8. Vu TQ, Maddipati R, Blute TA, Nehilla BJ, Nusblat L, and Desai TA. Peptide-Conjugated Quantum Dots Activate Neuronal Receptors and Initiate Downstream Signaling of Neurite Growth, **Nano Letters** 5(4): 603-607, 2005.
9. Nehilla BJ, Vu TQ, and Desai TA. Stoichiometry-dependent formation of quantum dot-antibody bioconjugates: an atomic force microscopy and agarose gel electrophoresis study. **J Phys Chem B**, 109, 20724-20730, 2005.
10. Vu TQ, Maddipati R, Blute TA, Nehilla BJ, Nusblat L, and Desai TA. Ligand-conjugated quantum dots for targeted drug delivery to nerve cells. Proceedings of the Special Topic Conference on Microtechnologies, **IEEE in Engineering in Biology and Medicine** May 2005.
11. Vu TQ, Qian H, Standaert RF, Chowdhury S, Pepperberg DR. Activation of Neural Receptor Channels Using Neurotransmitter Conjugates Designed for Surface Attachment. **Biomaterials**, 25(14):1605-2195, 2005.
12. Nehilla, B.J., Popat, K.C., Vu TQ, Chowdhury, S., Standaert, R.F., Pepperberg, D.R., and Desai, T.A. A Neurotransmitter Analog Tethered to a Silicon Platform for Neuro-bioMEMS Applications,

**Biotechnology and Bioengineering**, 87(5):669-674, 2004.

13. Saifuddin U\*, Vu, TQ\*, Rezac M, Qian H, Pepperberg DR, Desai TA. Toward Development of Bioactive, Neurotransmitter-immobilized Surfaces for Interaction with Post-synaptic Membrane Receptors. **Journal of Biomedical Materials Research**, 66A(1):184-191, 2003. (\*co- first authors)
14. Vu TQ, Payne, JA, Copenhagen DC. Localization and developmental expression patterns of the neuronal K-Cl cotransporter (KCC2) in the rat retina. **Journal of Neuroscience** 20(4):1414-23, 2000.
15. Vu TQ, McCarthy ST, and Owen WG. Linear transduction of natural stimuli by dark-adapted and light-adapted rods of the tiger salamander, *Tigris Ambystoma*. **Journal of Physiology** 505 (1): 193-204, 1997.
16. Furnary A., Trumble D, Vu TQ, Magovern G, Kao R. Perineural leads and burst stimulation optimize contraction of skeletal muscle. **American Society for Artificial Internal Organs Transactions**, 37:3:M164-6, 1991.

**Book Chapters:**

1. Fichter KM, Ardeshiri A, Vu TQ. Tracking Single Biomolecules in Live Cells using Quantum Dot Nanoparticles. In: **Methods in Bioengineering**. Series Editors: Yarmush ML and Langer RS. Artech House (*submitted*).
2. Vu TQ and Liu HY. Quantum Dot Hybrid Gel Blotting: A Technique for Identification of Quantum Dot-Protein/Protein-Protein Interactions. In: **Nanoscale Molecular-Interaction Technologies in Manipulation of Biomolecules**. Eds. Lee, JW and Foote, RS. **Methods in Molecular Biology Series**. Humana Press. (*in press*)
3. Vu TQ, Sundara Rajan S. Quantum Dot Imaging and Diagnostics in Neural Cells and Tissues. In **At the Building Block Level: Nanotechnology for Biology and Medicine**, Editor: Silva, GA. Springer Scientific, (*in press*).
4. Krizaj D, Vu TQ, and Copenhagen DC. 1999. On the shaping, modulation, and synaptic transmission of rod and cone light responses. In **The Retinal Basis of Vision**, Toyoda, J., Murakami, M., Kaneko, A., and Saito, T., Eds. Amsterdam: Elsevier.

**Patents:**

1. **Vu TQ** and Liu, HY. "A Method for Separation and Identification of Proteins Using Unconventional Gel Electrophoresis and Nanoparticle Quantum Dot Tags", PCT/US2007/082255 (patent pending).
2. **Vu TQ**. "Nanoparticle Platforms for Sorting, Capture, and Placement of Cells", PCT/US2006 (patent pending).

**Selected Recent Abstracts:**

1. Rajan Sundara S. and **Vu TQ**. High Resolution Imaging of NGF Receptor Trafficking using Quantum Dot Probes. Society for Neuroscience, San Diego, 2007.
2. **Vu TQ**. Nanoparticle Quantum Dots for Targeted Neuromodulation, ACS Particles Conference, Orlando, Florida, 2006.
3. Rajan Sundara S. and **Vu TQ**. Quantum dot probes for tracking nerve growth factor ligand-receptor dynamics in live neurons. Proceedings of the NSTI Nanotec Conference, Boston, MA; 2006.
4. Pattani, V and **Vu TQ**. Design and Fabrication of Quantum Dot Nanoparticle Arrays for Molecular Diagnostics. Micro-Nano Breakthrough Conference. Portland, OR; 2005.
5. Feigelson, D. and **Vu TQ**. Nanoparticle Platforms for Sorting, Capture, and Placement of Cells. Micro-Nano Breakthrough Conference. Portland, OR; 2005.
6. Elder RB, **Vu TQ**, Desai TA, Cook PB. GABA Agonist Linked to a Quantum Dot Activates GABA-A and GABA-C Receptor Currents in Intact Retinal Slice. Association for Research in Vision and

Principal Investigator/Program Director (Last, First, Middle):

Ophthalmology, 2005.

7. **Vu TQ**, Elder RB, Nehilla BJ, Cook PB, and Desai TA. Quantum Dot Ligand Conjugates for Functional Activation and Long Term Monitoring of Receptor Signaling Cascades in Living Cells. Cambridge Health Institute: In Vivo Molecular Imaging: Pre-Clinical to Clinical, 2004.
8. Pepperberg DR, **Vu TQ**, Chowdhury S, Standaert RF, Qian H. GABA Receptor Activation by a Tetherable Analog of Muscimol Designed for Application in a Neuromodulating Molecular Device. Association for Research in Vision and Ophthalmology, 2004.