CURRICULUM VITAE

Name

Payne Y. Chang

Contact Information

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Experience

Software Engineer — **Nemetschek Vectorworks, Cross Platforms Team, Columbia, Maryland**
2012/09 - Present

- Carbon framework to Cocoa framework conversion.
- Software resource conversion and management.
- Software localization.

Postdoctoral Fellow — **Center for Learning and Memory, University of Texas at Austin, Austin, Texas**
2006/09 - 2012/08

- Designed, coded, tested, and documented Ephic (an application written in C++) for simultaneous control of patch-clamp amplifier and high-speed CCD camera. Characterized and configured the camera to record low-intensity signals at high speed (1000 fps). Developed versatile experimental control over sophisticated experiments. Created and implemented algorithms for processing and analyzing imaging and electrical data.
  Webpage at ***http://paynesnotebook.net/Research/C++/Ephic/***
- Devised algorithms and developed programs to analyze animal behavior videos.
  Webpage at ***http://paynesnotebook.net/Research/C++/BehaviorAnalysis/***
- Designed and performed calcium-sensitive dye imaging and voltage-sensitive dye imaging.
- Designed and performed whole-cell patch clamp recording and field potential recording experiments.
- Used NEURON, Python, and Matlab to model, simulate and analyze neuronal activities.

Postdoctoral Fellow — **University of Wisconsin-Madison, Madison, Wisconsin**
2006/05 - 2006/08
Graduate Research Assistant
2000/06 - 2006/05

- Designed and developed PhotoZ (a C/C++ application) for simultaneous control of Axon patch-clamp amplifier and a photo-diode array system. Designed electronic circuit and modified the photo-diode array system to automate gain control of post-amplifiers.
  Webpage at ***http://paynesnotebook.net/Research/C++/PhotoZ/***
- Developed AmpZ to analyze amperometry data recorded by Axon pClamp program.
  Webpage at ***http://paynesnotebook.net/Research/C++/AmpZ/***
- Designed and performed voltage-sensitive dye imaging and field potential recording experiments.

Education

PhD in Biophysics — **University of Wisconsin-Madison, Madison, Wisconsin**
2000/06 - 2006/05

- Thesis: Heterogeneous spatial patterns of long-term potentiation in hippocampal slices

MS in Life Science — **National Tsing Hua University, Hsinchu, Taiwan**
1996/09 - 1998/06

- Thesis: The interaction between glycosaminoglycan and snake toxin as studied by computer simulation and microscopic technology

BS in Electrical Engineering — **National Tsing Hua University, Hsinchu, Taiwan**
1992/10 - 1996/06

- Senior project: Xdraw - a color image processing and analysis program with a

graphical user interface (developed with C language on X Window System, Sun SPARCstation 20)

Key Skills

Programming Languages and Web Techniques
C, C++, C#, Java, Python, HTML, CSS

Programming Techniques
Computer Graphics, Computer Vision, Image Processing and Analysis, Digital Signal Processing, Numerical Methods

Computer Graphics, Computer Vision, GUI Design
OpenGL, FLTK, Cocoa Framework, Video Processing and Analysis

Operating Systems
Microsoft Windows, Mac OS

Integrated Development Environments
Microsoft Visual Studio, Apple Xcode

Computer Simulation
NEURON

Electrophysiology
Whole-cell Patch Clamp Recording, Field Potential Recording, Electrical Data Processing and Analysis

Computer and Camera Interfaces
Microstar Laboratories DAP 3200e/214 & 5400a, HEKA ITC-18, EDT PCI DV C-Link

Instruments
Axon Patch-clamp Amplifier, Dagan Patch-clamp Amplifier, RedShirtImaging CCD-SMQ Camera, Allied Vision Technologies GE680 High-speed Camera

Imaging, Optics, Microscopy
Voltage-sensitive Dye Imaging, Calcium-sensitive Dye Imaging, Differential Interference Contrast Optics, Fluorescence Microscopy, Imaging Data Processing and Analysis

Grants and Awards

2007	Jerzy E. Rose Neuroscience Award for original and significant research in the neurosciences, University of Wisconsin-Madison
2004 - 2005	Pre-doctoral Research Fellowship, Epilepsy Foundation

Society Memberships

2003 - Present	Society for Neuroscience

Research Articles

1. Lin YH, Lee SC, **Chang PY**, Rajan PK, Sue SC, Wu WG. Heparin binding to cobra basic phospholipase A2 depends on heparin chain length and amino acid specificity. ***FEBS Lett.*** 1999 Jun 25; 453(3):395-9.

2. Wang CT, Grishanin R, Earles CA, **Chang PY**, Martin TF, Chapman ER, Jackson MB. Synaptotagmin modulation of fusion pore kinetics in regulated exocytosis of dense-core vesicles. ***Science.*** 2001 Nov 2; 294(5544):1111-5.

3. Wang CT, Lu JC, Bai J, **Chang PY**, Martin TF, Chapman ER, Jackson MB. Different domains of synaptotagmin control the choice between kiss-and-run and full fusion. ***Nature.*** 2003 Aug 21; 424(6951):943-7.

4. **Chang PY**, Jackson MB. Interpretation and optimization of absorbance and fluorescence signals from voltage-sensitive dyes. ***J Membr Biol.*** 2003 Nov 15; 196(2):105-16.

5. Wang CT, Bai J, **Chang PY**, Chapman ER, Jackson MB. Synaptotagmin-Ca2+ triggers two sequential steps in regulated exocytosis in rat PC12 cells: fusion pore opening and fusion pore dilation. ***J Physiol.*** 2006 Jan 15; 570(2):295-307.

6. **Chang PY**, Jackson MB. Heterogeneous Spatial Patterns of Long-Term Potentiation in Hippocampal Slices. ***J Physiol.*** 2006 Oct 15; 576(2):427-443.

7. **Chang PY**, Taylor PE, Jackson MB. Voltage Imaging Reveals the CA1 Region at the CA2 Border as a Focus for Epileptiform Discharges and Long-Term Potentiation in Hippocampal Slices. ***J Neurophysiol.*** 2007 Sep; 98(3):1309-22.

8. Dean C, Liu H, Dunning FM, **Chang PY**, Jackson MB, Chapman ER. Synaptotagmin-IV modulates synaptic function and long-term potentiation by regulating BDNF release. ***Nat Neurosci.*** 2009 Jun; 12(6):767-76.

9. Kim CS, **Chang PY**, Johnston D. Knockdown of HCN1 channels in dorsal hippocampus enhances network activity and leads to anxiolytic- and antidepressant-like effects. ***Neuron*** 2012 Aug 9; 75(3):503-16.

10. Chiang CW, Chen YC, Lu JC, Chang CW, Huang PC, Chang YT, **Chang PY**, and Wang CT. Synaptotagmin I Regulates Patterned Spontaneous Activity in the Developing Rat Retina via Calcium Binding to the C2AB Domains. ***PLoS One.*** 2012;7(10):e47465.

Conference Abstracts

1. Wang CT, Earles CA, Grishanin R, **Chang PY**, Martin TFJ, Chapman ER, Jackson MB. Fusion pore dynamics regulated by synaptotagmin. Program No. 497.24.2001 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2001. Online.

2. **Chang PY**, Jackson MB. Optimization and interpretation of voltage-sensitive dye signals for voltage imaging in brain slices. Program No. 759.3.2003 Neuroscience Meeting Planner. New Orleans, LA: Society for Neuroscience, 2003. Online.

3. **Chang PY**, Jackson MB. Imaging heterogeneous spatial patterns of long-term potentiation in the rat hippocampal ca1 region. Program No. 56.17.2004 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2004. Online.

4. Dean CB, **Chang PY**, Chapman ER, Jackson MB. Synaptotagmin IV knock-out mice show increased magnitude and spread of LTP. Program No. 733.7.2005 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2005. Online.

5. **Chang PY**, Jackson MB. Imaging long-term potentiation and depotentiation induced by theta-burst stimulations in the CA1 region of rat hippocampal slices. Program No. 967.1.2005 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2005. Online.

6. Dean CB, Liu H, Dunning FM, **Chang PY**, Bhalla A, Jackson MB, Chapman ER. Synaptotagmin-IV is recruited to synapses by activity and regulates BDNF release to modulate synaptic function. Program No. 710.9. 2009 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2009. Online.

7. Huang P, Sosanya N, **Chang PY**, Nguyen K, Perrone-Bizzozero NI, Raab-Graham KF. mTOR serves as a switch for neuronal excitability by the reversible binding of miR-129 and HuD to Kv1.1 mRNA. Program No. 43.11. 2010 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2010. Online.

8. **Chang PY**, Raab-Graham KF, Johnston D. Kv1.1 containing potassium channels regulate back propagation of bursts of action potentials in apical dendrites of CA1 pyramidal neurons. Program No.18. 2011 Conference on Learning and Memory. The University of Texas at Austin, Austin, TX.

9. Kim CS, **Chang PY**, Johnston D. Knockdown of HCN1 channels in dorsal hippocampus leads to antidepressant-like behavior. Program No. 907.28. 2011 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2011. Online.