

Yu-Tien Hsu

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Graduate Institute of Biomedical Sciences
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Work Experience

Stanford University, Palo Alto, California Stanford Neuroscience Institute & Department of Neurosurgery

- Aug. 16'-Jun. 20' **Research Scientist**
Investigating the molecular mechanisms underlying synaptic plasticity & cognitive functions.
- Aug. 11'-Aug.16' **Postdoctoral Research Associate**
Retinoic signaling-mediated synaptic metaplasticity controls Hebbian long-term plasticity and contextual learning.

Education

- Sep. 07'-Aug.11' **Ph.D. in Neuroscience. University of Southern California, Los Angeles, California**
Dissertation: *Mechanisms underlying BDNF stimulation of mTOR-dependent protein synthesis.*
- Sep. 03'-Dec. 05' **M.S. in Physiological Science. University of California, Los Angeles, California**
Thesis: *A genetic tool for studying epigenetic regulation during astroglialogenesis.*
- Sep. 99'-Jun. 03' **B.S. dual major in Zoology and in Horticulture. National Taiwan University, Taipei, Taiwan**
Undergraduate Thesis: *Designed a neurobiology lab course for undergraduates*

Research Experience

- Aug.11'-Jun. 20' *Postdoctoral associate in* **Laboratory of Cellular, Molecular and Behavioral Neuroscience PI: Dr. Lu Chen.** Department of Neurosurgery, Stanford University
- Studied how homeostatic plasticity impact on Hebbian plasticity via retinoic acid (RA)-mediated signaling *in vivo*.
 - Investigating how enriched environment (EE) impacts on memory engrams recruitment and the subsequent learning in fragile X syndrome (FXS) mouse model.
- Sep. 06'-Aug. 11' *PhD student & Research specialist in* **Laboratory of Molecular and Behavioral Neuroscience PI: Dr. Michel Baudry.** Neuroscience Program, University of Southern California
- Studied the effects of positive AMPA receptor modulation, which rapidly stimulates BDNF release and increases dendritic mRNA translation.
 - Studied the casual relationship between calpain activation and BDNF-induced protein synthesis.
 - Studied the mechanisms and sex differences of PDE10A inhibitor (papaverine)-induced dopaminergic signaling in rat striatal slices.
- Dec. 05'-Apr. 06' *Research Associate in* **Laboratory of Cancer Research, PI: Drs. Johannes Czernin and Wolfgang Weber.** Department of Molecular & Medical Pharmacology, UCLA David Geffen School of Medicine
- Evaluated the drug efficiency and involved mechanisms of the tyrosine kinase inhibitor, Gefitinib, in 5 lung cancer cell.
 - Performed microPET and microCT scans of various xenograft mice models.
 - Performed biodistribution studies to confirm the pharmacokinetics of various PET tracers *in vivo*.
- Feb. 04'-Sep. 05' *Master's student in* **Laboratory of Stem Cell Research, PI: Dr. Yi Sun.** Department of Molecular and Medical Pharmacology, UCLA
- Studied how DNA methylation and histone modifications are regulated.

Sep. 02'-Jun. 03' *Undergraduate student in Laboratory of Cellular Electrophysiology,*

PI: Dr. Chien-Yuan Pan. Department of Zoology, National Taiwan University

- Designed a neurobiology lab course for undergraduates covering: patch clamp, neuronal culture from rat cortex, cell culture of macrophage for fluorescent labeling.

Publications

First-authored papers:

1. **Hsu YT**, Li J, Wu D, Südhof TC and Chen L. Synaptic retinoic acid receptor signaling mediates mTOR-dependent metaplasticity that controls hippocampal learning. *Proc. Natl Acad. Sci. USA* 2019 April 2; 116(14):7113-7122.
 - Commentary by Walters BJ and Josselyn SA. Retinoic acid receptor plays both sides of homeostatic plasticity. *Proc. Natl Acad. Sci. USA* 2019 April 2; 116(14):6528-6530.
2. Briz V*, **Hsu YT***, Li Y, Lee E, Bi X, Baudry M. Calpain-2-mediated PTEN degradation contributes to BDNF-induced stimulation of dendritic protein synthesis. *J. Neurosci.* 2013 Mar 6; 33(10):4317-28. [*Co-First Authorship]
3. **Hsu YT**, Liao G, Bi X, Oka T, Tamura S, Baudry M. The PDE10A inhibitor, papaverine, differentially activates ERK in male and female rat striatal slices. *Neuropharmacology.* 2011 Jul 28; 61(8):1275-81.
4. Jourdi H*, **Hsu YT***, Zhou M*, Qin Q, Bi X, Baudry M. Positive AMPA receptor modulation rapidly stimulates BDNF release and increases dendritic mRNA translation. *J. Neurosci.* 2009 Jul 8; 29(27):8688-97. [*Co-First Authorship]

Co-authored paper:

5. Li J, Jiang RY, Arendt KL, **Hsu YT**, Zhai SR, Chen L. Defective memory engram reactivation underlies impaired fear memory recall in Fragile X syndrome. *Elife.* 2020 Nov 20. Doi:10.7554/eLife.61882
6. Yee AX, **Hsu YT** and Chen L. A metaplasticity view of the interaction between homeostatic and Hebbian plasticity. *Philos Trans R Soc Lond B Biol Sci.* 2017 Mar 5:372(1715).
7. Liang J, Xu W, **Hsu YT**, Yee AX, Chen L, Südhof TC. Conditional neuroligin-2 knockout in adult medial prefrontal cortex links chronic changes in synaptic inhibition to cognitive impairments. *Mol Psychiatry.* 2015 Mar 31. doi: 10.1038/mp.2015.31.
8. Wang Y, Zhu G, Briz V, **Hsu YT**, Bi X. and Baudry M. A molecular brake controls the magnitude of long-term potentiation. *Nature Commun.* 2014;5:3051.
9. Morgan TE, Davis DA, Iwata N, Tanner JA, Snyder D, Ning Z, Kam W, **Hsu YT**, Winkler JW, Chen JC, Petasis NA, Baudry M, Sioutas C, Finch C. Glutamatergic neurons in rodent models respond to nanoscale particulate urban air pollutants in vivo and in vitro. *Environ Health Perspect.* 2011 Apr 7;119 (7):1003-9.
10. Yu L, Rostamiani K, **Hsu YT**, Wang Y, Bi X, Baudry M. Calpain-mediated regulation of stargazin in adult rat brain. *Neuroscience.* 2011 Mar 31;178:13-20.
11. Su H. Seimbille Y, Ferl GZ, Bodenstern C, Fueger B, Kim KJ, **Hsu YT**, Dubinett SM, Phelps ME, Czernin J, Weber WA. Evaluation of [(18)F]gefatinib as a molecular imaging probe for the assessment of the epidermal growth factor receptor status in malignant tumors. *Eur J Nucl Med Mol Imaging.* 2008 Jun;35(6):1089-99.

Honors and Awards

USC Graduate Programs in Biomedical and Biological Sciences (PIBBS) Provost fellowship. 2007-2008

Outstanding Teaching Assistant Awards, Department of Biological Science, USC 2008-2009

USC Women in Science and Engineering (WiSE) travel Grant. Fall, 2009 and 2010

TA Mentor. USC College Teaching Assistant Training 2009 and 2010

Conference Presentation & Posters

1. **Hsu YT.** Metaplasticity: from molecule to behavior. Invited talk at Department and Graduate Institute of Pharmacology, National Taiwan University, July 2019.
2. **Hsu YT.** Metaplasticity: from molecule to behavior. Invited talk at China Medical University, June 2019.
3. **Hsu YT, Li J, Wu D, Südhof TC and Chen L.** Synaptic retinoic acid signaling mediates mTOR- dependent metaplasticity that controls hippocampal learning. (2018, Society for Neuroscience, San Diego, CA)
4. **Hsu YT, Wu D, Südhof TC and Chen L.** Retinoic signaling-mediated synaptic metaplasticity controls Hebbian long-term plasticity and contextual learning. (2016, Gordon Research Conference: Synaptic Transmission Waterville Valley NH)
5. **Hsu YT and Chen L.** The role of RAR α -mediated synaptic signaling *in vivo*. (2015, Society for Neuroscience, Chicago IL)
6. **Hsu YT and Chen L.** Retinoic acid and memory. Invited talk by Neuroclub at University of California Santa Barbara CA 2014.
7. Zhu G., Wang Y., Briz V., **Hsu YT**, Bi X., Baudry M. Dual and opposite functions for calpain in long-term potentiation induction and consolidation (2013, Society for Neuroscience, San Diego, CA)
8. Zhu G., Wang Y., Briz V., **Hsu YT**, Bi X., Baudry M. Dual and opposite functions for calpain in long-term potentiation induction and consolidation (2013 The Biology of Calpains in Health and Disease, Saxtons River, CA)
9. **Hsu YT**, Qi Q, Bi X, Baudry M. BDNF-induced stimulation of protein synthesis involves calpain-mediated degradation of PTEN. (2011 Society for Neuroscience Washington DC)
10. Xu X, **Hsu YT**, Yu L, Bi X, Baudry M. Differential effects of kainate-induced seizure activity on PTEN, mTOR and Arc in hippocampus of adult and neonatal rats. (2011 Society for Neuroscience Washington DC)
11. **Hsu YT**, Chou M, Liao G, Bi X, Oka T, Tamura S, Baudry M. The PDE10A inhibitor, papaverine, differentially activates ERK in male and female rat striatal slices. (2010 Society for Neuroscience San Diego CA)
12. Baudry M, Kramar E, **Hsu YT**, Liao G, Xu X, Clausen A, Lynch G, Gall CM, Bi X. Lack of LTP consolidation in a mouse model of Angelman syndrome is associated with impaired cytoskeletal reorganization. (2010 Society for Neuroscience San Diego CA)
13. Morgan T.E, Davis D.A., Iwata N, Tanner J.A, Ning Z, Kam W, **Hsu YT**, Winkler J.W, Petasis N.A, Baudry M, Sioutas C, Finch. C.E. Urban ultrafine airborne particles (air pollution) act directly on neurons and glia. (2010 Society for Neuroscience San Diego CA)
14. **Hsu YT**, Jourdi H, Zhou M, Bi X, Baudry M. Positive AMPA receptor modulation rapidly stimulates BDNF release and increases dendritic mRNA translation. (2009 Society for Neuroscience, Chicago IL)
15. **Hsu YT**, Jourdi H, Baudry M. Neuronal Activity and BDNF Mediate Stimulation of Translation by Postive AMPA Receptor Modulators. (2009 Alzheimer's Disease Research Update. Los Angeles CA)
16. **Hsu YT**, Baudry M. Positive AMPA receptor modulation rapidly stimulates dendritic mRNA translation through BDNF release. (Oral presentation at Center for the Neurobiology of Learning and Memory (CNLM) meeting Irvine CA)
17. **Hsu YT**, Zhou M, Bi X, Baudry M, Jourdi H, Neuronal Activity and Brain-Derived Neurotrophic Factor Mediate Stimulation of Translation by Postive AMPA Receptor Modulators. (2007 Society for Neuroscience, San Diego CA)
18. Evilevitch V, Su H, **Hsu YT**, Phelps M, Czernin J, Weber W. Comparison of the metabolic and cytotoxic effects of cisplatin chemotherapy. (J Nucl Med Meeting Abstracts 2006 47:435p)

Reviewer

PLOS ONE, Brain Research

Teaching Experience

Lab Instructor at USC College of Letters, Arts and Sciences

Fall 2008, 2009

BISC120: General Biology: Organismal Biology and Evolution

Spring 2009

BISC150: The Nature of Human Health and Disease

Mentoring Experience

Visiting scholars: Lifei Yu (Children's Hospital of Fudan University), Yi Li (Western Univ. of Health Sciences), Minh-Vu Nguyen (Albert Einstein College of Medicine), Jing Liang (Chinese Academy of Sciences)

Postdoc scholar: Jie Li (Stanford Univ.), Jillian Shaw (Stanford Univ.), Lan Guo (Stanford Univ.), Bing Cao (Stanford Univ.)

Graduate students: Xiaobo Xu (USC), Piper Keyes (Stanford Univ.)

Undergraduate students: Adrian Au (USC), Erin Lee (USC), Caitlin Esparza (Stanford Univ.), Jessie Choo (Stanford Univ.)