

**CURRICULUM VITAE**

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NAME		POSITION TITLE	
Lien, Cheng-Chang		Distinguished Professor of Neuroscience Dean, School of Life Sciences	
EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
China Medical University, Taiwan	M.D.	1990-1997	Medicine
University of Freiburg, Germany	Ph.D.	1998-2003	Physiology/Neuroscience (Mentor: Peter Jonas)
University of Freiburg, Germany	Postdoc	2003-2004	Physiology/Neuroscience (Supervisor: Peter Jonas)
University of California, Berkeley, USA	Postdoc	2004-2006	Neurobiology (Supervisor: Mu-Ming Poo)
Heidelberg University, Germany	Visiting scientist	2012 (July-Sep.)	Institute for physiology and pathophysiology (Prof. Andreas Draguhn)
Charité – Universitätsmedizin Berlin, Germany	Research fellow	2016-2018	Alexander von Humboldt Foundation Fellowship

**A. Personal statement (Research narrative)**

My lab is interested in understanding brain circuits and behavior in health and disease. More recently we have become increasingly interested in neural mechanisms underlying emotion and cognition. We mainly focus on two key regions in the limbic system, that is, the hippocampus and amygdala. To establish causal relationships between brain circuits and behavior, we combine the optogenetic or chemogenetic approach with different readout methodologies including electrophysiology and calcium imaging in freely moving animals. To uncover the input-output organization of the network, we employ optogenetics-assisted circuit mapping in brain slices maintained *in vitro* or in intact brains *in vivo*. Over the past decade, we have highlighted the relevance of GABAergic circuitry in both network and cognitive functions.

**Positions and Honors.****Positions and Employment**

Since 2020.11: Dean of School of Life Science, National Yang-Ming University  
 Since 2017.08: Distinguished Professor, National Yang-Ming University  
 Since 2017.01: Director of the Institute of Neuroscience, National Yang-Ming University, Taiwan  
 Since 2015.08: Professor of the Institute of Neuroscience, National Yang-Ming University, Taiwan  
 2011.02 – 2015.07: Associate Professor of the Institute of Neuroscience, National Yang-Ming University, Taiwan

2006.07 – 2011.02: Assistant Professor of the Institute of Neuroscience, National Yang-Ming University, Taiwan

1997– 1998: Medical Residency, Neurology, National Taiwan University Hospital, Taiwan

#### **Other Experience and Professional Memberships**

2019 – Present: Executive Director and Permanent Member, Taiwanese Society for Computational Neuroscience (SfCN)

2018 – Present: Study Section, Ministry of Science & Technology Grant Review Panel

2016 – Present: Permanent Member, The Chinese Physiological Society, Taiwan

2008 – Present: Regular Member, Society for Neuroscience (SfN), USA

2008 – Present: Permanent Member, Neuroscience Society of Taiwan

#### **Other Academic Activities and Services**

1. Member of Scientific Committee for EMBO Workshop on Neural Development (2-6, March, 2018), Taipei, Taiwan

2. Council Member of Neuroscience Society of Taiwan (2016 – 2018 year)

3. Executive Director of Taiwanese Society for Computational Neuroscience (2019 – present)

#### **Ad hoc Peer Review for Scientific Journals**

PNAS, eLife, Journal of Neuroscience, Journal of Neurophysiology, Journal of Physiology (London), Biochimica et Biophysica Acta (BBA – General Subjects), Chinese Journal of Physiology, Developmental Neurobiology, PLoS ONE, Neurotoxicity Research; Current Topics in Medicinal Chemistry, Neuropharmacology, Journal of Neuroscience Research, Scientific Reports, Frontiers in Cellular Neuroscience, Cerebral Cortex, Physiology & Behavior, Journal of Visualized Experiments, EJN, Oncotarget; Science signalling; European Neuropsychopharmacology, J Biomedical Science, Journal of the Chinese Medical Association (JCMA); Journal of Neuroscience, eLife

#### **Review Editorial Board**

**2015** Frontiers in Cellular Neuroscience

**2016** Scientific Reports; Frontiers in Cellular Neuroscience; Neural Plasticity (Guest Editor); French National Research Agency (ANR; External Reviewer); Frontiers in Aging Neuroscience (Review Editor); Matters

**2018** External Reviewer of Danish Research in relation to NIH Brain Initiative; French National Research Agency (ANR; External Reviewer)

**2019** National Science Centre in Poland (Grant Reviewer)

#### **Honors**

2020/02: Honors with Qualifications for Permanent Assessment Exemption for Teachers

2017-2019: NYMU Academic Excellence Award (the same award received in 2015-2016; 2013-2014; 2011-2012)

2017-2019: Distinguished Professor, National Yang-Ming University

2017: MOST Outstanding Research Award

2016: TienTe Lee Young Scientist Research Award

2016 – 2018: Research Fellow of Alexander von Humboldt Foundation, Germany

2015 – 2016: NeuroCure Fellowship, Berlin, Germany

2012: Award of German Academic Exchange Service (DAAD) Scholarship for the research visit at the Institute for Physiology and Pathophysiology, Ruprecht-Karls-Universität Heidelberg, Germany

2007 – 2012: Teaching award for outstanding teachers in the School of Medicine, National Yang-Ming University.

2010: The Best Poster Award of 2010 TPEVGH-UST Research Grant.

2006: Award of stipend from Cold Spring Harbour for the imaging course: Imaging Structure & Function in the Nervous Systems.

2003: Doctoral thesis with the grade “*summa cum laude*” and research doctorate (research supervisor: Peter Jonas) from Albert-Ludwigs-Universität Freiburg, Germany.

2002: Award of stipend from Marine Biological Laboratory (Woods Hole, USA) for the “Method in Computational Neuroscience” summer course.

1998 – 2003: Award of German Academic Exchange Service (DAAD) Scholarship for the international PhD program in the Institute of Physiology, Albert-Ludwigs-Universität Freiburg, Germany.

#### **Invited Speeches/Chairs in International Conferences**

1. 2019/07/15 IN-N-OUT of Dentate Inhibitory Circuits: Invited by Dr. Ching-Lung Hsu, Janelia Research Campus, Howard Hughes Medical Institute (HHMI), Ashburn, Virginia, USA.
2. 2018/09/17 Circuit specificity in the inhibitory architecture of the dentate gyrus: DANDRITE lecture: invited by DANDRITE, Dept. Biomedicine, Aarhus University, Denmark.
3. 2018/09/10 Connectivity and function of a longitudinal hippocampal circuitry: The 29th Ion Channel Meeting: invited by CIRB, CNRS UMR, Collège de France.
4. 2018/03/05 Session chair (co-chair with Cyril Herry) for “Circuit formation and function”, EMBO Workshop on Neural Development, Taipei, Taiwan
5. 2017/12/21 Deconstructing Psychophysiology of Chronic Pain: Innsbruck Neuroscience Research Network: Invited by University of Innsbruck, Austria
6. 2015/08/16 - 2015/08/21 Pathway-Specific Recruitment of Dentate Gyrus Interneurons: Invited Talk, Gordon Research Conference, USA.
7. 2016/04/19 Dentate Gyrus GABAergic Circuits: IN-N-OUT Synapses: Invited by Université de Liège, Belgium.
8. 2015/12/07 Inhibitory control of memory circuits: Invited by EMBO/Neural Development Conference, Taipei, Taiwan.
9. 2015/12/02 Dentate Gyrus GABAergic Circuits: IN-N-OUT Synapses: Invited by NeuroCure, Charite, Germany.
10. 2015/11/19 Pathway-specific recruitment of dentate gyrus interneurons: Invited by 10th Conference of the Czech Neuroscience Society with International Participation and the Taiwan-Czech Neuroscience Symposium.
11. 2015/11/17 Pathway-specific recruitment of dentate gyrus interneurons: Invited by Institute of Experimental Medicine, Hungarian Academy of Science, Hungary.
12. 2014/11/20 Dynamic Inhibitory Control of the Gateway of the Hippocampus: Invited by National Institute of Aging/seminar.
13. 2014/06/12 - 2014/06/14 Shunting Inhibition Controls the Gateway of the Hippocampus: Invited by The University of Hong Kong/Physiology Symposium 2014.
14. 2013/07/11 Shunting Inhibition Controls the Gateway of the Hippocampus: Invited by Department of Pharmacology, UC Davis, USA.
15. 2012/10/25 Distinct dynamic switch of GABA release in fast-spiking and non-fast-spiking GABAergic interneurons in the hippocampus: Invited by KOJACH Symposium 2012 in Pusan/Korean Physiological Society.
16. 2012/09/12 Role of acid-sensing ion channel in synaptic function, learning and memory: Invited by Institute of science and technology, Austria.
17. 2012/07/27 - 2013/09/27 Acid-Sensing Ion Channels in The Hippocampus: Invited by Department of Physiology and Pathophysiology, Heidelberg University, Germany.

#### **B. Peer-reviewed publications (in reverse chronological order).**

1. Wu PC, Fann MJ, Tran TT, Chen SC, Devina T, Cheng IH, Lien CC, Kao LS, Wang SJ, Fuh JL, Tzeng TT, Huang CY, Shiao YJ, Wong YH (2019). Assessing the therapeutic potential of *Graptopetalum paraguayense* on Alzheimer's disease using patient iPSC-derived neurons. **Scientific Reports** 9(1): 19301.

2. Hsu YT, Chang YG, Liu YC, Wang KY, Chen HM, Lee DJ, Yang SS, Tsai CH, Lien CC\*, Chern YJ\*. (2019). Enhanced Na<sup>+</sup>-K<sup>+</sup>-2Cl<sup>-</sup> cotransporter 1 underlies motor dysfunction in Huntington's disease. **Movement Disorders** 34(6): 845-857. (\*corresponding)
3. Martina M\*, Lien CC\* (2018). Book Chapter: Physiological properties of hippocampal neurons. **Hippocampal Microcircuits**: 91-126. (\*corresponding)
4. Chen CY, Di Lucente J, Lin YC, Lien CC, Rogawski MA, Maezawa I, Jin LW (2018). Defective GABAergic neurotransmission in the nucleus tractus solitarius in Mecp2-null mice, a model of Rett syndrome. **Neurobiology of Disease** 109(Pt A): 25-32.
5. Kuo YL, Cheng JK, Hou WS, Chang YC, Du PH, Jian JJ, Rau RH, Yang JH, Lien CC, Tsaur ML (2017). K<sup>+</sup> channel modulatory subunits KCHIP and DPP participate in Kv4-mediated mechanical pain control. **Journal of Neuroscience** 37(16): 4391-4404.
6. Huang CY, Lien CC, Cheng CF, Yen TY, Chen CJ, Tsaur ML (2017). K<sup>+</sup> channel Kv3.4 is essential for axon growth by limiting the influx of Ca<sup>2+</sup> into growth cones. **Journal of Neuroscience** 37(17): 4433-4449.
7. Lee CT, Kao MH, Hou WH, Wei YT, Chen CL, Lien CC (2016). Causal evidence for the role of specific GABAergic interneuron types in entorhinal recruitment of dentate granule cells. **Scientific Reports** 6: 36885.
8. Hou WH, Kuo N, Fang GW, Huang HS, Wu KP, Zimmer A, Cheng JK, Lien CC (2016). Wiring specificity and synaptic diversity in the mouse lateral central amygdala. **Journal of Neuroscience** 36(16): 4549-4563.
9. Hsu TT, Lee CT, Tai MH, Lien CC (2016). Differential recruitment of dentate gyrus interneuron types by commissural versus perforant pathways. **Cerebral Cortex** 26(6): 2715-2727.
10. Wu CC, Lien CC, Hou WH, Chiang PM, Tsai KJ (2016). Gain of BDNF function in engrafted neural stem cells promotes the therapeutic potential for Alzheimer's disease. **Scientific Reports** 6: 27358.
11. Chang CP, Lee CT, Hou WS, Lin MS, Lai HL, Chien CL, Chang C, Cheng PL, Lien CC\*, Chern Y\* (2016). Type VI adenylyl cyclase negatively regulates GluN2B-mediated LTD and spatial reversal learning. **Scientific Reports** 6: 22529. (\*corresponding)
12. Chiang PH, Chien TC, Chen CC, Yanagawa Y, Lien CC (2015). ASIC-dependent LTP at multiple glutamatergic synapses in amygdala network is required for fear memory. **Scientific Reports** 5:10143.
13. Lin SH, Chien YC, Chiang WW, Liu YZ, Lien CC, Chen CC (2015). Genetic mapping of ASIC4 and contrasting phenotype to ASIC1a in modulating innate fear and anxiety. **European Journal of Neuroscience** 41(12): 1553-1568.
14. Chen WT, Hsieh YF, Huang YJ, Lin CC, Lin YT, Liu YC, Lien CC, Cheng IH (2015). G206D mutation of presenilin-1 reduces Pen2 interaction, increases A $\beta$ 42/A $\beta$ 40 ratio and elevates ER Ca<sup>2+</sup> accumulation. **Molecular Neurobiology** 52(3): 1835-1849.
15. Liu YC, Cheng JK, Lien CC (2014). Rapid dynamic changes of dendritic inhibition in the dentate gyrus by presynaptic activity patterns. **Journal of Neuroscience** 34(4): 1344-1357.
16. Cheng CF, Cheng JK, Chen CY, Lien CC, Chu D, Wang SY, Tsaur ML (2014). Mirror-image pain is mediated by NGF produced from TNF $\alpha$ -activated satellite glia after peripheral nerve injury. **Pain** 155(5): 906-920.
17. Chan CF, Kuo TW, Weng JY, Lin YC, Chen TY, Cheng JK, Lien CC (2013). Ba<sup>2+</sup>- and bupivacaine-sensitive background K<sup>+</sup> conductances mediate rapid EPSP attenuation in oligodendrocyte precursor cells. **Journal of Physiology** 591(19): 4843-4858. (an editor's choice and the highlight by the Perspectives in the same issue)

18. Wu PY, Huang YY, Chen CC, Hsu TT, Lin YC, Weng JY, Chien TC, Cheng IH, Lien CC (2013). Acid-sensing ion channel-1a is not required for normal hippocampal LTP and spatial memory. **Journal of Neuroscience** 33(5): 1828-1832.
19. Sun YY, Lin SH, Lin HC, Hung CC, Wang CY, Lin YC, Hung KS, Lien CC, Kuan CY, Lee YH (2013). Cell type-specific dependency on the PI3K/Akt signaling pathway for the endogenous Epo and VEGF induction by baicalein in neurons versus astrocytes. **PLoS ONE** 8(7): e69019.
20. Lee YC, Durr A, Majczenko K, Huang YH, Liu YC, Lien CC, Tsai PC, Ichikawa Y, Goto J, Monin ML, Li JZ, Chung MY, Mundwiller E, Shakkottai V, Liu TT, Tesson C, Lu YC, Brice A, Tsuji S, Burmeister M, Stevanin G, Soong BW (2012). Mutations in *KCND3* cause spinocerebellar ataxia type 22. **Annals of Neurology** 72(6): 859-869.
21. Majumder P, Chen YT, Bose JK, Wu CC, Cheng WC, Cheng SJ, Fang YH, Chen YL, Tsai KJ, Lien CC, Shen CK (2012). TDP-43 regulates the mammalian spinogenesis through translational repression of Rac1. **Acta Neuropathologica** 124(2): 231-245.
22. Chiang PH, Wu PY, Kuo TW, Liu YC, Chan CF, Chien TC, Cheng JK, Huang YY, Chiu CD, Lien CC (2012). GABA is depolarizing in hippocampal dentate granule cells of the adolescent and adult rats. **Journal of Neuroscience** 32(1): 62-67.
23. Weng JY, Lin YC, Lien CC (2010). Cell type-specific expression of acid-sensing ion channels in hippocampal interneurons. **Journal of Neuroscience** 30(19): 6548-6558.
24. Lin YC, Liu YC, Huang YY, Lien CC (2010). High-density expression of Ca<sup>2+</sup>-permeable ASIC1a channels in NG2 glia of rat hippocampus. **PLoS ONE** 5(9): e12665.
25. Chu KC, Chiu CD, Hsu TT, Hsieh YM, Huang YY, Lien CC (2010). Functional identification of an outwardly rectifying pH- and anesthetic-sensitive leak K<sup>+</sup> conductance in hippocampal astrocytes. **European Journal of Neuroscience** 32(5): 725-735.
26. Chiang PH, Yeh WC, Lee CT, Weng JY, Huang YY, Lien CC (2010). M1-like muscarinic acetylcholine receptors regulate fast-spiking interneuron excitability in rat dentate gyrus. **Neuroscience** 169(1): 39-51.
27. Liao CW, Lien CC (2009). Estimating intracellular Ca<sup>2+</sup> concentrations and buffering in a dendritic inhibitory hippocampal interneuron. **Neuroscience** 164(4): 1701-1711.
28. Lien CC, Mu Y, Vargas-Caballero M, Poo MM (2006). Visual stimuli-induced LTD of GABAergic synapses mediated by presynaptic NMDA receptors. **Nature Neuroscience** 9(3): 372-380.
29. Aponte Y, Lien CC, Reisinger E, Jonas P (2006). Hyperpolarization-activated cation channels in fast-spiking interneurons of rat hippocampus. **Journal of Physiology** 574(Pt 1): 229-243.
30. Oliver D#, Lien CC#, Soom M, Baukowitz T, Jonas P, Fakler B (2004). Functional conversion between A-type and delayed rectifier K<sup>+</sup> channels by membrane lipids. **Science** 304(5668): 265-270. (#: equally contributing).
31. Lien CC, Jonas P (2003). Kv3 potassium conductance is necessary and kinetically optimized for high-frequency action potential generation in hippocampal interneurons. **Journal of Neuroscience** 23(6): 2058-2068.
32. Lien CC, Martina M, Schultz JH, Ehmke H, Jonas P (2002). Gating, modulation, and subunit composition of voltage-gated K<sup>+</sup> channels in dendritic inhibitory interneurons of rat hippocampus. **Journal of Physiology** 538(Pt 2): 405-419.