

BIOGRAPHICAL DATA

Chien-Chang Chen

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SUMMARY

Dr. Chien-Chang Chen works in the field of physiology, with his research focusing on the mechanisms underlying the development of persistent chronic pain using optogenetics, chemogenetics, in vivo imaging, gene targeting, electrophysiological, pharmacological and behavioral approaches in wild type and genetically modified mice. Dr. Chen's early studies at IBMS focused on understanding the role of T-type Ca²⁺ channels in brain and cardiovascular system, especially related to human diseases such as cardiac ischemia-reperfusion injury, cardiac hypertrophy, platelet function and pain sensation. For the past ten years, however, Dr. Chen's laboratory has actively investigated the role of the anterior nucleus of paraventricular thalamus (PVA) in chronic pain and the formation of hyperalgesia priming. Dr. Chen's studies show that PVA is involved in the development and maintenance of chronic in several rodent models. Dr. Chen also investigates the underlying mechanism for the transition from acute pain to chronic pain. Dr. Chen received his Ph.D. in Physiology and Biophysics from University of Illinois at Urbana-Champaign and post-doctoral training in ion channel and mouse genetics at Howard Hughes Medical Institute at University of Iowa. Dr. Chen accepted a faculty position as an Assistant Research Fellow at the Institute of Biomedical Sciences at Academia Sinica in 2005, earning promotion to Associate Research Fellow in 2011 and to Research Fellow/Professor in 2018. Dr. Chen served as the Director of the Department of International Affairs from 2019-2020. He is currently the Director of the Department of Academic Affairs and Instrument Services at Academia Sinica.

EDUCATION

1985-1989: B.S. Zoology, National Taiwan University, Taipei, Taiwan.

1989-1991: M.S. Zoology, National Taiwan University, Taipei, Taiwan.

1991-1993: M.S. Molecular and Integrative Physiology, University of Illinois at Urbana-Champaign.

1993-1998: Ph.D. Molecular and Integrative Physiology, University of Illinois at Urbana-Champaign.

EXPERIENCE

1998-2003: Postdoctoral research fellow, Howard Hughes Medical Institute at University of Iowa.

2003-2005: Assistant Research Scientist, Department of Physiology and Biophysics at University of Iowa.

2005-2011: Assistant Research Fellow, Institute of Biomedical Sciences, Academia Sinica.

2011-2018: Associate Research Fellow, Institute of Biomedical Sciences, Academia Sinica.

2018-date: Research Fellow, Institute of Biomedical Sciences, Academia Sinica.

2019-2020: Director, Department of International Affairs, Academia Sinica.

2020-date: Director, Department of Academic Affairs and Instrument Service, Academia Sinica.

HONORS AND SPECIAL RECONGNITION RECEIVED

2017 Selection of Important Findings of Year 2017, Academia Sinica.

2014 Selection of Important Findings of Year 2014, Academia Sinica.

2010 Academia Sinica Career Development Award.

2001 Research Development Grant, Muscular Dystrophy Association.

1997 Graduate College Conference Travel Grant, University of Illinois.

1995 Student Stipend Award, American Heart Association, Illinois Affiliate.

REPRESENTATIVE PUBLICATOINS

1. Lin, C.Y., Chang, Y.M., Tseng, H.Y., Shih, Y.L., Yeh H.H., Liao, Y.R., Tang, H.H., Hsu, C.L., Chen, C.C., Yang, Y.T., Kao, C.F. (2023) Epigenetic regulator RNF20 underlies temporal hierarchy of gene expression to regulate postnatal cardiomyocyte polarization. *Cell Reports*, **42(11)**, 113416 (<https://doi.org/10.1016/j.celrep.2023.113416>)
2. Chang, Y.W., Chen, Y.C. and Chen, C.C* (2023) Identification of Novel Targeting Sites of Calcineurin and CaMKII in Human CaV3.2 T-Type Calcium Channel. *Biomedicines*, **11(11)**, 2891 (<https://doi.org/10.3390/biomedicines11112891>)
3. Suresh, P., Jasmin, S., Yen, Y., Hsu, H.J., Varintra, P., Pairojana, T., Chen, C.C. and Liu, I.Y. (2022) Attenuation of HECT-E3ligase expression rescued memory deficits in 3xTg-AD mice. *Front. Aging Neurosci.* **14:91690**
4. Yeh, H.h., Chang, Y.M., Chang, Y.W., Lu., M.Y.J., Chen, Y.H., Lee., C.C., and Chen, C.C* (2022) Multiomic analyses reveal enriched glycolytic processes in β -myosin heavy chainexpressed cardiomyocytes in early cardiac hypertrophy. *Journal of Molecular and Cellular Cardiology Plus* **1**. <https://doi.org/10.1016/j.jmccpl.2022.100011>
5. Herzig, V.*†, Chen, Y.C.,†, Chin, Y.K.Y., Dekan, Z., Chang, Y-W, Yu, H.M., Alewood, P.F., Chen, C.C,* and King, G.F.* (2022) The Tarantula Toxin ω -Avsp1a Specifically Inhibits Human CaV3.1 and CaV3.3 via the Extracellular S3-S4 Loop of the Domain 1 Voltage-Sensor. *Biomedicines* **10(5):1066**. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9138389/>
6. Tamang, H.K., Yang, R.B., Song, Z.H., Hsu, S.C., Peng, C.C, Tung, Y.C, Tzeng, B.H.*, and Chen, C.C* (2022) Cav3.2 T-type calcium channel regulates mouse platelet activation and arterial thrombosis. *Journal of Thrombosis and Haemostasis* (doi: 10.1111/jth.15745). <https://onlinelibrary.wiley.com/doi/10.1111/jth.15745>
7. Chen, W.H., Lien, C.C. & Chen, C.C.* (2022) Neuronal basis for pain- and anxiety-like behaviors in CeA. *Pain* **163 (3)**, e463-e475. <https://pubmed.ncbi.nlm.nih.gov/34174041/>
8. Hu, Y.F., Lee, A.S., Chang, S.L., Lin, S.F., Weng, C.H., Lo, H.Y., Chou, P.C., Tsai, Y.N., Sung, Y.L., Chen, C.C., Yang, R.B., Lin, Y.C. Kuo, T.B., Wu, C.H., Liu, J.D., Chung, T.W., & Chen, S.A. (2021) Biomaterial-induced conversion of quiescent cardiomyocytes into pacemaker cells in rats. *Nature Biomedical Engineering* **6(4):421-434**. <https://pubmed.ncbi.nlm.nih.gov/34811487/>
9. Chang, Y.W., Song, Z.H. & Chen, C.C.* (2021) FAK regulates cardiomyocyte mitochondrial fission and function through Drp1. *FEBS Journal* **289(7):1897-1910**. <https://pubmed.ncbi.nlm.nih.gov/34739186/>
10. Chang, Y.T., Chen, W.H., Shih, H.C., Shyu, B.C., Min, M.Y. & Chen, C.C. (2019) Anterior nucleus of paraventricular thalamus mediates chronic mechanical hyperalgesia. *Pain*, **160(5)** 1208-1223. (Editor's Choice) <https://pubmed.ncbi.nlm.nih.gov/31009420/>
11. Chen, W.H., Chang, Y.T., Cheng, S.J. & Chen, C.C. (2018) Spinal PKC/ERK signal pathway mediates hyperalgesia priming. *Pain*, **159 (5)**, 907-918. <https://pubmed.ncbi.nlm.nih.gov/29672451/>
12. Cheng#, Y.F., Chang#, Y.T., Chen, W.H., Shih, H.C., Chen, Y.H., Shyu, B.C. & Chen, C.C. (2017) Cardioprotection induced in mouse model of neuropathic pain via anterior nucleus of paraventricular thalamus. *Nature Communnications*, **8**, 826, doi:10.1038/s41467-017-00891-z. (#, These authors contributed equally). <https://pubmed.ncbi.nlm.nih.gov/29018188/>
13. Chang, Y.M., Ling, L., Chang, Y.T., Chang, Y.W., Li, W.H., Shih*, A.C.C. & Chen*, C.C. (2017) Three TF Co-expression Modules Regulate Pressure-Overload Cardiac Hypertrophy in Male Mice. *Sci Rep*, **7(1):7560**. (*, co-corresponding authors) <https://pubmed.ncbi.nlm.nih.gov/28790436/>