

## TAI Hwan-Ching



Position: Professor

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**Professor Tai** obtained a B.Sc. degree from the Department of Chemistry, National Taiwan University, and a Ph.D. degree in Chemistry from the California Institute of Technology in 2010, mentored by Erin Schuman and Linda Hsieh-Wilson. He conducted postdoctoral research at Harvard Medical School/Massachusetts General Hospital in Bradley Hyman's group (2010-2012). In 2012, he joined the Department of Chemistry at National Taiwan University as an assistant Professor and was promoted to associate professor in 2017. In 2021, he joined the School of Public Health at Xiamen University as a Nanqiang Distinguished Professor. In 2026, he became a professor at the State Key Laboratory of Mechanism and Quality of Chinese Medicine at Macau University of Science and Technology.

Dr. Tai received the Periodic Table of Younger Chemists award from IUPAC in 2019, representing the Phosphorous element. He is a recipient of the Changjiang Scholar Professorship Program from the Ministry of Education of China, and the Wu Ta-You Memorial Award from the National Science Council (for distinguished Taiwanese young scientists).

Dr. Tai is an internationally renowned expert on the molecular mechanisms of Alzheimer's disease and tau protein pathology. He was the first to discover tau protein oligomers accumulating in the neuronal synapses of Alzheimer's patients. In collaboration with industrial partners, the Tai group co-developed APNmAb005, a first-in-class antibody drug against tau protein oligomers. It is the first anti-tau-prion therapy in the world to enter human clinical trial against Alzheimer's disease (clinicaltrials.gov NCT05344989).

Dr. Tai's research areas also include chemical biology and multi-omics analyses, covering diverse topics including the transcriptomics of neuronal synapses, the detection of protein post-translation modifications, and the nanostructure of plant cellulose. He is also a world-renowned expert on the material-acoustic properties of Stradivarius violins. He has published first-author or

corresponding-author papers in leading journals including *Cell*, *Nature Plants*, *Nature Reviews Neuroscience*, *PNAS*, *Current Biology*, *Journal of the American Chemical Society*, and *Angewandte Chemie*. His research findings have been widely reported by international media outlets including *The New York Times*, *The Washington Post*, *The Times*, and BBC.

### Academic Qualifications

2010.7	Ph.D. in Chemistry, California Institute of Technology, USA
2000.7	B.Sc. in Chemistry, National Taiwan University

### Professional Experience

2026.01-present	Professor, State Key Laboratory of Mechanism and Quality of Chinese Medicine, Macau University of Science and Technology, Macau, China.
2021.12-2026.01	Nanqiang Distinguished Professor, Department of Experimental Medicine, School of Public Health, Xiamen, China.
2017.08-2021.11	Associate Professor, Department of Chemistry, National Taiwan University, Taipei, ROC.
2012.07-2017.07	Assistant Professor, Department of Chemistry, National Taiwan University, Taipei, ROC.
2010.07-2012.05	Postdoctoral researcher, Massachusetts General Hospital, Harvard Medical School, USA.
2010.01-2010.05	Postdoctoral researcher, California Institute of Technology, USA.

### Papers published in the past five years (2021-2025)

1. Crystal structures of distinct parallel and antiparallel DNA G-quadruplexes reveal structural polymorphism in C9orf72 G4C2 repeats. Geng, Y; Liu, C.; Miao, H.; Suen, M. C.; Xie, Y.; Zhang, B.; Han, W.; Wu, C.; Ren, H.; Chen, X.; Tai, H.C.; Wang, Z.\*; Zhu, G.\*; Cai, Q.\* *Nucleic Acids Res.*, 2025, 53, gkaf879.
2. Tai, H. C.\*; Tsao, C. S.; Lin, J. H. Reply to: Critical comment on the assumptions leading to 24-chain microfibrils in wood. ***Nat. Plants***, 2024, 10, 1067–1070.
3. Zheng, H.#; Sun, H.#; Cai, Q.; Tai, H.C.\* The enigma of tau protein aggregation: mechanistic insights and future challenges. *Int. J. Mol. Sci.* 2024, 25, 4969.

4. Cai, Q.; Tai, H. C.\* (2024). Super-Resolution Imaging of Tau Proteins in Isolated and Immobilized Brain Synaptosomes. In: Smet-Nocca, C. (eds) Tau Protein: Methods and Protocols. Methods in Molecular Biology, vol 2754, pp 445-456. Humana, New York, NY.
5. Wu, X.; Guo L. Z.; Liu, Y. H.; Leung Y. S.; Tai, H. C.\*; Wang, T. D.; Chuang, Y. H.\*; Lin, C. H.; Chou, P. T.\*; Lai I. R.\*; Liu, T. M.\* Plasma fluorochromics for the diagnosis of acute mesenteric ischemia. Proc. SPIE 12822, Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases 2024, 1282204 (San Francisco, USA).
6. Tai, H. C.\*; Chang, C. H.; Cai, W.; Lin, J. H.; Huang, S. J.; Lin, Q. Y.; Yuan, E. C. Y.; Li, S. L.; Lin, Y. C. J.; Chan, J. C. C.\*; Tsao, C. S.\* Wood cellulose microfibrils have a 24-chain core-shell nanostructure in seed plants. **Nat. Plants**, 2023, 9, 1154–1168.
7. Wu, C. Y.; Chen, H. J.; Wu, Y. C.; Tsai, S. W.; Liu, Y. H.; Bhattacharya, U.; Lin, D.; Tai, H. C.; Kong, K. V.\* Highly Efficient Singlet Oxygen Generation by BODIPY–Ruthenium(II) Complexes for Promoting Neurite Outgrowth and Suppressing Tau Protein Aggregation. *Inorg. Chem.*, 2023, 62, 1102–1112.
8. Wu, X.; Guo, L. Z.; Liu, Y. H.; Liu, Y. C.; Yang, P. L.; Leung, Y. S.; Tai, H. C.\*; Wang, T. D.; Lin, J. C. W.; Lai, C. L.\*; Chuang, Y. H.\*; Lin, C. H.; Chou, P. T.\*; Lai, I. R.\*; Liu, T. M.\* Plasma riboflavin fluorescence as a diagnostic marker of mesenteric ischemia-reperfusion injury in rats. *Thromb. Res.*, 2023, 223, 146-154.
9. Cai, W.; Tai, H. C.\* The Materials Chemistry of Chinese Guqin Zithers—Decoding the Mysteries of an Intangible Cultural Heritage. *Arkivoc*, 2023, (ii), 202312008.
10. Cai, W.; Cheng, Y. K.; Tseng, H. H.; Tai, H. C.\*, Lo, S. F.\* Identification and characterization of wood from antique Chinese guqin zithers. *J. Cult. Herit.*, 2022, 53, 72-79.
11. Cai, W.\*; Tai, H. C. The Price is right. *Strad*, 2022, 133(1582), 70-71.
12. Cheng H.; Tai, H. C.\* A nanovesicle platform to deliver neoantigens and immune checkpoint inhibitors: To ASPIRE for novel cancer vaccines. *MedComm Biomater. Appl.*, 2022, 1, e4.
13. Lkhagva, A; Tai, H. C.\* Dimethylcysteine (DiCys)/o-Phthalaldehyde Derivatization for Chiral Metabolite Analyses: Cross-Comparison of Six Chiral Thiols. *Molecules*, 2021, 26, 7416.
14. Bhattacharya, U.; Jhou, J. J.; Zou Y. F.; Abrigo, G.; Lin, S. W.; Chen, Y. H.; Chien F. C.; Tai, H. C.\* Surface charge manipulation and electrostatic immobilization of synaptosomes for super-resolution imaging: a study on tau compartmentalization. *Sci. Rep.* 2021, 11, 18583.
15. Su, C. K.#; Chen, S. Y.#; Chung, J. H.; Li, G. C.; Brandmair, B.; Huthwelker, T.; Fulton J. L.; Borca, C. N.; Huang, S. J.; Nagyvary, J.; Tseng, H. H.; Chang, C. H.; Chung, D. T.; Vescovi, R.; Tsai, Y. S.; Cai, W.; Lu, B. J.; Xu, J. W.; Hsu, C. S.; Wu, J. J.; Li, H. Z.; Jheng, Y. K.; Lo, S. F.; Chen, H. M.; Hsieh, Y. T.; Chung, P. W.; Chen, C. S.; Sun, Y. C.; Chan, J. C. C.; Tai, H. C.\* Materials engineering of violin soundboards by Stradivari and Guarneri. **Angew. Chem. Int. Ed.**, 2021, 60, 19144-19154.
16. Yuan, E. C. Y.; Huang, S. J.; Huang, H. C.; Sinkkonen, J.; Oss, A.; Org, M. L., Samoson\*, A.; Tai, H. C.\*; Chan, J. C. C.\* Faster magic angle spinning reveals cellulose conformations in woods. *ChemComm.* 2021, 57, 4110-4113.
17. Cai, W.; Tai, H. C.\* Wood Treatment: The Magic Touch. *Strad*, 2021, 132(1580), 48-51.