

CURRICULUM VITAE

Ann-Shyn Chiang (江安世)

AFFILIATION

- Tsing Hua Distinguished Chair Professor (清華特聘講座教授)
Director, Brain Research Center (腦科學研究中心主任)
National Tsing Hua University, Hsinchu 300044, Taiwan
終身國家講座, 中央研究院院士, 世界科學院院士
Tel: 886-3-5742760; E-mail: aschiang@life.nthu.edu.tw
- International Faculty, Kavli Institute for Brain and Mind (KIBM) at the
University of California, San Diego (美國聖地牙哥 Kavli 腦與心智研究中心國際研究員)



FIELDS OF SPECIALTY

Brain research, Connectomics, Neurogenetics, Behaviors, Bioimaging

RESEARCH INTERESTS

Our research focuses on studying neural plasticity in the *Drosophila* brain, exploring how large populations of neurons collaborate to drive behaviors. We use bioimaging, genetic tools, and AI analysis to investigate structural and functional connectomes. Objectives include developing high-throughput tools for connectome reconstruction, exploring genes and molecules influencing synaptic plasticity, and mapping protein-synthesis-dependent memory codes for insights into decision-making. Our goal is to decipher how learning and memory shape the brain.

EDUCATION

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| 1990 | Ph.D. in Entomology, Rutgers University, New Jersey, USA |
| 1983 | M.S. in Plant Pathology and Entomology, National Taiwan University, Taiwan |
| 1981 | B.S. in Entomology, National Chung-Hsing University, Taiwan |

ACADEMIC POSITION

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| 2024-present | Tenured Chair Professor (終身講座教授), National Chiao Tung University, Taiwan (陽明交通大學) |
| 2021-present | Adjunct Distinguished Chair Professor, Institute of Brain and Mind Sciences, National Taiwan University (台灣大學) |
| 2019-present | Adjunct Chair Professor, Tunghai University (東海大學), Taiwan |
| 2017-present | Adjunct Investigator, Institute of Molecular and Genomic Medicine, The National Health Research Institutes (國家衛生院), Taiwan |
| 2016-present | Adjunct Investigator, Institute of Physics, Academia Sinica (中央研究院), Taiwan |
| 2016-present | Adjunct Distinguished Investigator, National Synchrotron Radiation Research Center, Taiwan (國家同步輻射研究中心) |
| 2016-present | Adjunct Distinguished Chair Professor, Graduate Institute of Clinical Medical Science, China Medical University (中國醫藥大學), Taiwan |
| 2014-present | Adjunct Chair Professor, Kaohsiung Medical University (高雄醫學大學), Taiwan |
| 2014-present | Tsing Hua Distinguished Chair Professor, National Tsing Hua University (清華大學特聘講座), Taiwan |

2014-2020 Dean, College of Life Science, National Tsing Hua University, Taiwan

2013-present Scientific Advisory Board member, Center for Brain Activity Mapping at UCSD

2013-present Scientific Advisory Board member, Cold Spring Harbor Conferences Asia, China

2011-present International Faculty, Kavli Institute for Brain and Mind (KIBM) at the University of California, San Diego, USA.

2010-present Adjunct Chair Professor, National Chiao Tung University (陽明交通大學), Taiwan

2008-present Adjunct Investigator, Genomics Research Center, Academia Sinica

2007-2014 Tsing Hua Chair Professor, National Tsing Hua University, Taiwan

2006-2008 Adjunct Professor, Cold Spring Harbor Laboratory, USA

2005 Chair of Biological Science Panel, National Science Council, Taiwan

2005-2010 Adjunct Professor, Department of Life Science, National Central University, Taiwan

2004-present Director, Brain Research Center, National Tsing Hua University, Taiwan

2002-2008 Director, Institute of Biotechnology, National Tsing Hua University, Taiwan

2001-2002 Visiting Scientist, Cold Spring Harbor Laboratory, USA

1997 Visiting Professor, Neurobiology Laboratory, CNRS, France

1997-present Professor, Department of Life Science, National Tsing Hua University, Taiwan

1994-2005 Advisor of EM Center, National Tsing Hua University, Taiwan

1992-1997 Associate Professor, Department of Life Science, National Tsing Hua University

1990-1992 Postdoc, Rutgers University, New Jersey, USA

HONOR

2022 Honorary Doctorate of Kaohsiung Medical University (高雄醫學大學 榮譽博士)

2022, 21, 20, 18 「FUTURE TECH Award」 National Science and Technology Council (國科會
「2020未來科技獎」，4次)

2021 National Chair Professorship Award, Ministry of Education (教育部第24屆終身國家講座，生物及醫農類科)

2020 Memorial Lecture of Li Yih-Yuen Emeritus Chair Professor (李亦園院士榮譽講座)

2020 Hou-De Honorary Chair (厚德榮譽講座)

2017 「遠見」雜誌再度選為「新台灣之光100」

2016 TWAS Fellow (世界科學院 院士)

2016 Presidential Special Lecturer, The Society for Neuroscience 2016 Annual Meeting (>35,000 participants)

2015 National Chair Professorship Award, Ministry of Education (教育部第19屆國家講座，生物及醫農類科)

2014 Academician, Academia Sinica (中央研究院 院士)

2013 有庠科技獎-科技論文獎

2012 Published the first Taiwanese's "**Science**" full article

2012 AEARU Distinguished Lecture (東亞研究型大學協會傑出講座)

2012 TWAS Prize in Biologoy (世界科學會 生物學類獎)

- 2012 Hou Jindui Distinguished Honor Award (侯金堆傑出榮譽獎—基礎科學生物類)
- 2011-2013 Academic Summit Project, NSC (國科會攻頂計畫)
- 2010 「遠見」雜誌-選為中華民國建國百年「新台灣之光100」
- 2009 The Fifty Scientific Achievements, NSC 50th anniversary (國科會50週年慶「50科學成就」)
- 2008 Teco Award of Teco Technology Foundation (東元科技獎化工/生物/醫工領域)
- 2008 HuiSun Chair of National Chung Hsing University (中興大學蕙蓀講座)
- 2007 Distinguished Alumnus of National Chung Hsing University (中興大學傑出校友)
- 2007 Outstanding Scholar Award, Foundation for the Advancement of Outstanding Scholarship (傑出人才基金會傑出人才講座)
- 2007 Sun Yat-sen Academic Award (中山學術獎)
- 2007 Outstanding Contributions in Science & Technology, Executive Yuan (行政院傑出科技貢獻獎)
- 2007 Academic Award of Ministry of Education (教育部學術獎)
- 2007 Published the first Taiwanese's "Cell" paper
- 2004,2010,2013 Outstanding Research Award, MOST, Taiwan (科技部傑出獎三次)
- 1990 First place in the Student Paper Competition, Eastern Branch of Entomological Society of America 62nd Annual Meeting, Baltimore, MD, USA
- 1989 Radclyffe B. Roberts Scholarship, Department of Entomology, Rutgers Univ, USA
- 1987 Thomas J. Headlee Fellowship, Department of Entomology, Rutgers Univ, USA

BIO-SKETCH

Received Ph.D. (1990) and trained as a postdoctoral fellow (1992) in Rutgers University, Ann-Shyn Chiang joined Department of Life Science, National Tsing Hua University as an associate professor (1992), promoted as professor (1997), took sabbatical to study *Drosophila* memory at Cold Spring Harbor Laboratory (2001) and became the adjunct International Faculty of Kavli Institute for Brain and Mind (KIBM) at the University of California, San Diego (2011). For his contribution to our understanding of memory formation using a connectomics approach, Chiang was elected as an Academician of Academia Sinica (2014) and The World Academy of Science Fellow (2016).

Chiang reconstructed a brain-wide wiring diagram in *Drosophila* (the New York Times reported this discovery as the first step toward mapping human brain) and published the first *Cell* (2007) paper from Taiwanese scientists. Guiding by this connectomics map, he and his colleagues discovered that long-term memory formation requires new protein synthesis only in few brain neurons and published the first full article in *Science* (2012) from Taiwanese scientists. He received many awards, including: Outstanding Research Award, National Science Council (2004, 2009, 2012), Outstanding Scholar Award, Foundation for the Advancement of Outstanding Scholarship (2007), Academic Award of Ministry of Education (2007), Outstanding Contributions in Science and Technology of Executive Yuan (2008), TWAS Prize in Biology (2012), and National Chair Award of Ministry of Education (2015, 2020). Chiang is currently the Director of Brain Research Center, and

the Distinguished Chair Professor of National Tsing Hua University.

SELLECTED PUBLICATIONS (154 papers in total, *: corresponding author, IF: impact factor)

1. Chu LA, Tai CY, Chiang AS* (2024) Thirst-driven hygro-sensory suppression promotes water seeking in *Drosophila*. *Proc Natl Acad Sci USA* (in press). (IF: 11.205)
2. Chuang YH, Wu YF, Lin YH, Chen YH, Zhou YX, Hsu SC, Li SM, Chiang AS, Chen YC, Chen SJ, Lin SJ* and Chu LA* (2024) Super resolution imaging in collagen abundant thick tissues. **Small Structures** (in press) (IF: 15.9).
3. Abubaker MB, Hsu FY, Feng KL, Chu LA, de Belle JS, Chiang AS* (2024). Asymmetric neurons are necessary for olfactory learning in the *Drosophila* brain. *Current Biology* 34, 1–12. (IF: 10.834)
4. Chen CC*, Lin HW, Feng KL, Tseng DW, de Belle JS, Chiang AS* (2023) A subset of cholinergic mushroom body neurons blocks long-term memory formation in *Drosophila*. *Cell Reports* 42,112974. (IF: 9.995)
5. Sakamura S, Hsu FY, Tsujita A, Abubaker MB, Chiang AS, and Matsuno K* (2023) Ecdysone signaling determines lateral polarity and remodels neurites to form *Drosophila's* left-right brain asymmetry. *Cell Reports* 6, 112337. (IF: 9.995)
6. Manubens-Gil L, Zhou Z, Chen H, Ramanathan A, Liu X, Liu Y, Bria A, Gillette T, Ruan Z, Yang J, Radojević M, Zhao T, Cheng L, Qu L, Liu S, Bouchard K, Gu L, Cai W, Ji S, Roysam B, Wang CW, Yu H, Sironi A, Iacone DM, Zhou J, Bas E, Sousa EC, Aguiar P, Li X, Li Y, Nanda S, Wang Y, Muresan L, Fua P, Ye B, He H, Staiger JF, Peter M, Cox DN, Simonneau M, Oberlaender M, Jefferis G, Ito K, Bellido PG, Kim J, Rubel E, Cline HT, Zeng H, Nern A, Chiang AS, Roskams J, Livesey R, Stevens J, Liu T, Dang C, Guo Y, Zhong N, Tourassi G, Hill S, Hawrylycz M, Koch C, Meijering E*, Ascoli GA*, Peng H* (2023) BigNeuron: A resource to benchmark and predict performance of algorithms for automated tracing of neurons in light microscopy datasets. *Nature Methods* 20, 824–835. (IF: 47.99)
7. Stampfl APJ, Liu Z, Hu J, Sawada K, Takano H, Kohmura Y, Ishikawa T, Lim JH, Je JH, Low CM, Teo A, Tok ES, Tan TW, Ban K, Libedinsky C, Tan FCK, Chen KP, Yang AC, Chuang CC, Chen NY, Shih CT, Lee TK, Yang DN, Lai HC, Shuai HH, Cheng CC, Ching YT, Li CW, Charng CC, Lo CC, Chiang AS, Recur B, Petibois C, Cheng CL, Chen HH, Yang SM, Hwu Y, Rojviriyaya C, Rugmai S, Rujirawat S, Margaritondo G* (2023) SYNAPSE: An international roadmap to large brain imaging. *Physics Reports* 999, 1–60. (IF: 25.6) [\[DOI\]](#)
8. Lin HW#, Chen CC#, Jhang RY, Chen L, de Belle JS, Tully T, Chiang AS* (2022) CREBB repression of protein synthesis in mushroom body gates long-term memory formation in *Drosophila*. *Proc Natl Acad Sci USA* 119, e2211308119. (IF: 11.205) [\[DOI\]](#)

9. Lin HW[#], Chen CC[#], de Belle JS, Tully T*, Chiang AS* (2021) CREBA and CREBB in two identified neurons gate long-term memory formation in *Drosophila*. ***Proc Natl Acad Sci USA*** 118, e2100624118. (IF: 11.205) [\[DOI\]](#)
10. Chu LA[#], Lu CH[#], Yang SM, Liu YT, Feng KL, Tsai YCh, Chang WK, Wang WC, Chang SW, Chen P, Lee TK, Hwu YK, Chiang AS*, Chen BC* (2019) Rapid single-wavelength lightsheet localization microscopy for clarified tissue. ***Nature Communications*** 10, 4762. (IF: 14.919) [\[DOI\]](#)
11. Feng KL and Chiang AS* (2019) Forgetting memories through distinct actin remodeling mechanisms. ***Proc Natl Acad Sci USA*** 116, 20807–20808. (IF: 11.205) [\[Link\]](#)
12. Sung YC, Jin PR, Chu LA, Hsu FF, Wang MR, Chang CC, Chiou SJ, Qiu JT, Gao DY, Lin CC, Chen YS, Hsu YC, Wang J, Wang FN, Yu PL, Chiang AS, Wu Anthony YT, Ko John JS, Lai Charles PK, Lu TT*, Chen Y* (2019) Delivery of nitric oxide with a nanocarrier promotes tumour vessel normalization and potentiates anti-cancer therapies. ***Nature Nanotechnology*** 14, 1160-1169. (IF: 39.213)
13. Zhang Y, Tsang TK, Bushong EA, Chu LA, Chiang AS, Ellisman MH, Reingruber J, Su CY* (2019) Asymmetric ephaptic inhibition between compartmentalized olfactory receptor neurons. ***Nature Communications*** 10, 1560. (IF: 14.919)
14. Wu JK, Tai CY, Feng KL, Chen SL, Chen CC, Chiang AS* (2017) Long-term memory requires sequential protein synthesis in three subsets of mushroom body output neurons in *Drosophila*. ***Scientific Reports*** 7: 7112 [\[DOI\]](#) (IF: 4.996)
15. Hwu Y*, Margaritondo G* and Chiang AS* (2017) Q&A: Why use synchrotron x-ray tomography for multi-scale connectome mapping? ***BMC Biology*** 15:122 [\[DOI\]](#) (IF: 6.779)
16. Lo CC*, Chiang AS* (2016) Toward whole-body connectomics. ***J Neurosci*** 36, 11375–11383. (IF: 6.167) (This review article reports the synchrotron x-ray imaging approach for mapping the connectome at single-neuron resolution ([Nature 2017](#)), based on Chiang's Presidential Lecture at the Neuroscience 2016 Annual Meeting).
17. Shih HW, Wu CL, Chang SW, Liu TH, Lai JSY, Fu TF, Fu CC, Chiang AS* (2015) Parallel circuits control temperature preference in *Drosophila* during aging. ***Nature Communications*** 6, 7775. (IF: 14.919)
18. Shih CT*, Sporns O, Yuan SL, Su TS, Lin YJ, Chuang CC, Wang TY, Lo CC, Greenspan RJ, Chiang AS* (2015) Connectomics-based analysis of information flow in the *Drosophila* brain. ***Current Biology*** 25, 1249-1258. (IF: 10.834)
19. Schoofs A, Hückesfeld S, Schlegel P, Miroshnikow A, Bader R, Zeymer M, Spieß R, Chiang AS, Pankratz MJ* (2014) Selection of motor programs for suppressing food intake and inducing locomotion in the *Drosophila* brain. ***PLoS Biol*** 12, e1001893. (IF: 9.593)

20. Wu MC, Chu LA, Hsiao PY, Lin YY, Chi CC, Liu TH, Fu CC*, Chiang AS* (2014) Optogenetic control of selective neural activity in multiple freely moving *Drosophila* adults. **Proc Natl Acad Sci USA** 111, 5367-5372. (IF: 11.205)
21. Wu CL, Shih MF M, Lee PT, Chiang AS* (2013) An octopamine–mushroom body circuit modulates the formation of anesthesia-resistant memory in *Drosophila*. **Current Biology** 23, 1-9. (IF: 10.834)
22. Lin HH, Chu LA, Fu TF, Dickson BJ, Chiang AS* (2013) Parallel neural pathways mediate CO₂ avoidance responses in *Drosophila*. **Science** 340, 1338-1341. (IF: 47.728 ; this article has been reviewed in the “PERSPECTIVES” of the same Science issue, p1295-1297)
23. Lin CY, Chuang CC, Hua TE, Chen CC, Dickson BJ, Greenspan RJ, Chiang AS* (2013) A comprehensive wiring diagram of the protocerebral bridge for visual information processing in the *Drosophila* brain. **Cell Reports** 3, 1739-1753. (IF: 9.995)
24. Pai TP, Chen CC, Lin HH, Chin AL, Lai JSY, Lee PT, Tully T, Chiang AS* (2013) *Drosophila* ORB protein in two mushroom body-output neurons is necessary for long-term memory formation. **Proc Natl Acad Sci USA** 110, 7898-7903. (IF: 11.205)
25. Lehnert BP, Baker AE, Gaudry Q, Chiang AS, Wilson RI* (2013) Distinct roles of TRP channels in auditory transduction and amplification in *Drosophila*. **Neuron** 77, 115-128. (IF: 15.982)
26. Chen CC, Wu JK, Lin HW, Pai TP, Fu TF, Wu CL, Tully T, Chiang AS* (2012) Visualizing long-term memory formation in two neurons of the *Drosophila* brain. **Science** 335, 678–685. [101 年大學指考試題 39-41] (IF: 47.728; This article was reviewed in the “PERSPECTIVES” of the same Science issue, p664-665; this article has been introduced by the Science Editor in the “EDITOR’S CHOICE” of the *Science Signaling* 14, ec50). This is the first Science full article published by Taiwanese scientists.
27. Lai JSY, Lo SJ, Dickson BJ and Chiang AS* (2012) Auditory circuit in the *Drosophila* brain. **Proc Natl Acad Sci USA** 109, 2607-2612. (IF: 11.205)
28. Chiang AS* (2011) Q&A: Ann-Shyn Chiang. **Current Biology** 21, R938-R939. (IF: 10.834)
29. Lee PT, Lin HW, Chang YH, Fu TF, Dubnau J, Hirsh J, Lee T and Chiang AS* (2011) Serotonin-mushroom body circuit modulating the formation of anesthesia-resistant memory in *Drosophila*. **Proc Natl Acad Sci USA** 108, 13794–13799. (IF: 11.205)
30. Wu CL, Shih MF Lai SY, Yang HT, Turner GC, Chen L, Chiang AS* (2011) Heterotypic gap junctions between two neurons in the *Drosophila* brain are critical for memory. **Current Biology** 21, 848-854. (IF: 10.834)
31. Chiang AS*, Lin CY, Chuang CC, Chang HM, Hsieh CH, Yeh CW, Shih CT, Wu JJ, Wang GT, Chen YC, Wu CC, Chen GY, Ching YT, Lee PC, Lin CY, Lin HH, Wu CC, Hsu HW, Huang YA, Chen JY, Chiang HJ, Lu CF, Ni RF, Yeh CY, Hwang JK (2011) Three-dimensional reconstruction of brainwide wiring networks in *Drosophila* at single cell resolution. **Current Biology** 21, 1-11.

(Article, cover story, [\[DOI\]](#), IF: 10.834; The New York Times reported this as the first step toward decoding the human brain [\[DOI\]](#))

32. Wu CL, Xia S, Fu TF, Wang H, Chen YH, Leong D, [Chiang AS*](#), Tully T* (2007) Specific requirement of NMDA receptors for long-term memory consolidation in *Drosophila* ellipsoid body. **Nature Neuroscience** 10, 1578-1586. (IF: 24.884)
33. Lin HH, Lai JSY, Chin AL, Chen YC, [Chiang AS*](#) (2007) A map of olfactory representation in the *Drosophila* mushroom body. **Cell** 128, 1205-1218. (IF: 41.582). This is the first Cell paper published by Taiwanese scientists.
34. Zhu S, Lin S, Kao CF, Awasaki T, [Chiang AS](#), Lee T* (2006) Gradients of the *Drosophila* chinmo BTB-zinc finger protein govern neuronal temporal identity. **Cell** 127, 409-422. (IF: 41.582)
35. Xia S, Miyashita T, Fu TF, Lin WY, Wu CL, Pyzocha L, Lin IR, Saitoe M, Tully T, [Chiang AS*](#) (2005) NMDA receptors mediate olfactory learning and memory in *Drosophila*. **Current Biology** 15, 603-615. (IF: 10.834; this article has been reviewed in the "Dispatch" of the *Current Biology* 15, R414-R419)
36. Agrawal N, Pallos J, Slepko N, Apostol BL, Bodai L, Chang LW, [Chiang AS](#), Thompson LM, Marsh JL (2005) Identification of combinatorial drug regimens for treatment of Huntington's disease using *Drosophila*. **Proc Natl Acad Sci USA** 102, 3777-3781. (IF: 11.205)
37. Iijima K, Liu HP, [Chiang AS](#), Konsolaki M, Zhong Y* (2004) Dissecting the pathological effects of human Abeta40 and Abeta42 in *Drosophila*: a potential model for Alzheimer's disease. **Proc Natl Acad Sci USA** 101, 6623-6628. (IF: 9.809)
38. Tamura T, [Chiang AS](#), Ito N, Liu HP, Horiuchi J, Tully T, Saitoe M* (2003) Aging specifically impairs amnesiac-dependent memory in *Drosophila*. **Neuron** 40, 1003-1011. (IF: 15.982)
39. Dubnau J, [Chiang AS](#), Grady L, Barditch J, Gossweiler S, McNeil J, Smith P, Buldoc F, Scott R, Certa U, Broger C, Tully T* (2003) The *staufen/pumilio* pathway is involved in *Drosophila* long-term memory. **Current Biology** 13, 286-296. (cover story) (IF: 10.834; this article has been reviewed in the "Dispatch" of the *Current Biology* 13, R126-R127)
40. Wang Y, [Chiang AS](#), Xia S, Kitamoto T, Tully T, Zhong Y* (2003) Blockade of neurotransmission in *Drosophila* mushroom bodies impairs odor attraction but not repulsion. **Current Biology** 13, 1900-1904. (IF: 10.834)
41. [Chiang AS*](#), Lin WY, Liu HP, Pszczolkowski MA, Fu TF, Chiu SL, Holbrook GL (2002) Insect NMDA receptors mediate juvenile hormone biosynthesis. **Proc Natl Acad Sci USA** 99, 37-42. (IF: 11.205)