Yen-Ping Hsueh, PhD

Max Planck Institute for Biology Tübingen

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Academic Positions

2024-current
Director, Max Planck Institute for Biology Tübingen, Tübingen, Germany

2015-2024
Assistant, Associate, and Research Fellow, Institute of Molecular Biology, Academia Sinica, Taipei, Taiwan

2016-2024
Adjunct faculty member at National Taiwan University, Taipei, Taiwan

Education

Ph.D. (2008)
Duke University, USA, Molecular Genetics and Microbiology

B.Sc. (2001) and M.Sc. (2003)
National Taiwan University, Plant Pathology and Microbiology

Research

2010-2015 Postdoctoral fellow with Prof. Paul W. Sternberg at Caltech, USA
2008-2010 Postdoctoral fellow with Prof. Joseph Heitman at Duke University, USA
2003-2008 Graduate student with Prof. Joseph Heitman at Duke University, USA

Teaching

2015-2024
Academia Sinica TIGP-MCB PhD Program
Lectures in Molecular and Cell Biology
Lectures in Experimental Approaches in Molecular and Cell Biology
Lectures in Professional Development for a Graduate Student

2016-2023
National Taiwan University
Lectures in Systems Microbiology
Lectures in Molecular Microbiology

2020-2024
Academia Sinica TIGP-MBAS PhD Program
Lectures in Advanced Microbiology

Publications

See here for online list.

(*Corresponding author; members of my own laboratory are in *italics*)

1. *Kuo CY, Tay RJ, Lin HC, Juan SC, Vidal-Diez de Ulzurrun G*, Chang YC, Hoki J, Schroeder FC, **Hsueh YP***. The nematode-trapping fungus Arthrobotrys oligospora detects prey pheromones via G protein-coupled receptors. ***Nat Microbiol*** 2024

2. *Lin HC, Vidal-Diez de Ulzurrun G, Chen SA, Yang CT, Tay RJ, Lizuka T., Huang TY, Kuo CY, Gonçalves AP, Lin SY*, Chang YC, Stajich J, Schwarz EM, **Hsueh YP***. Key processes required for the different stages of fungal carnivory by a nematode-trapping fungus. ***PLoS Biol*** 2023 21(11): e3002400. (Cover).
- EurekAlert
- National Geographic

3. *Lee CH, Lee YY*, Chang YC, Pon WL, Lee SP, Wali N, Nakazawa T, Honda Y, Shie JJ, **Hsueh YP***. A carnivorous mushroom paralyzes and kills nematodes via a volatile ketone. ***Science Advances*** 2023; 9(3) eade4809.
- The New York Times
- Scientific American

4. *Chen SA, Lin HC*, **Hsueh YP***. The cAMP-PKA pathway regulates prey sensing and trap morphogenesis in the nematode-trapping fungus Arthrobotrys oligospora. ***G3 Genes|Genomes|Genetics*** 2022; jkac217. (Cover).

5. *Chen SA, Lin HC,* Schroeder FC, **Hsueh YP*** Prey sensing and response in a nematode-trapping fungus is governed by the MAPK pheromone response pathway. ***Genetics*** 2021; 217(2):iyaa008. (Issue Highlight).

6. *Huang TY, Lee YY, Vidal-Diez de Ulzurrun G*, **Hsueh YP*** Forward genetic screens identified mutants with defects in trap morphogenesis in the nematode-trapping fungus Arthrobotrys oligospora. ***G3 Genes|Genomes|Genetics*** 2021; 11(2):jkaa022.

7. *Vidal-Diez de Ulzurrun G, Lee YY,* Stajich JE, Schwarz EM*, **Hsueh YP***. Genomic analyses of two Italian oyster mushroom Pleurotus pulmonarius strains. ***G3 Genes|Genomes|Genetics*** 2021; 11(2):jkaa007.

8. *Lee YY, Vidal-Diez de Ulzurrun G*, Schwarz EM., Stajich JE, **Hsueh YP***. Genome sequence of the oyster mushroom Pleurotus ostreatus strain PC9. ***G3 Genes|Genomes|Genetics*** 2021; 11(2):jkaa008.

9. *Lin HC*, **Hsueh YP*** Laboratory maintenance and culturing of the nematode-trapping fungus Arthrobotrys oligospora. ***Curr Protoc.*** 2021; 1(2):e41.

10. Tsai CE, Yang FJ, Lee CH, **YP Hsueh**, CJ Kuo, CS Chen*. The conserved regulator of autophagy and innate immunity hlh-30/TFEB mediates tolerance of enterohemorrhagic Escherichia coli in Caenorhabditis elegans. ***Genetics*** 2021; 217(1):iyaa034.

11. Kuo CY, Chen SA, **Hsueh YP***. The high osmolarity glycerol (HOG) pathway functions in osmosensing, trap morphogenesis and conidiation of the nematode-trapping fungus Arthrobotrys oligospora. J. Fungi 2020; 6:191.

12. Yang CT, Vidal-Diez de Ulzurrun G, Goncalves AP, Lin HC, Chang CW, Huang TY, Chen SA, Lai CK, Tsai IJ, Schroeder FC, Stajich JE, Hsueh YP*. Natural diversity in the predatory behavior facilitates the establishment of a robust model strain for nematode-trapping fungi. PNAS 2020; 117(12):6762-6770.

13. *Kuo TH#, Yang CT#,* Chang HY, **Hsueh YP***, Hsu CC*. Nematode-trapping fungi produce diverse metabolites during predator–prey interaction. ***Metabolites*** 2020; 10(3):117. (# equal contributions)

14. *Lee CH, Chang HW, Yang CT,* Wali N, Shie JJ, **Hsueh YP***. Sensory cilia as the Achilles heel of nematodes when attacked by carnivorous mushrooms. ***PNAS*** 2020; 117(11):6014-22.

- Commentary: Renahan T. and Sommer RJ. Mechanism of murderous mushrooms paves path for parasitic helminth halt. ***PNAS*** 117(13):6974-6975.

15. *Vidal-Diez de Ulzurrun G, Huang TY, Chang CW, Lin HC*, **Hsueh YP***. Fungal feature tracker (FFT): A tool for quantitatively characterizing the morphology and growth of filamentous fungi. ***PLoS Comput Biol.*** 2019; 15(10):e1007428. (Cover Story)

- Highlighted by AAAS EurekAlert.

16. Kanzaki N, Liang WR, Chiu CI, *Yang CT*, **Hsueh YP**, Li HF*. Nematode-free agricultural system of a fungus-growing termite. ***Sci Rep***. 2019; 9(1):8917.

17. *Vidal-Diez de Ulzurrun G*, **Hsueh YP***. Predator-prey interactions of nematode-trapping fungi and nematodes: both sides of the coin. ***Appl Microbiol Biotechnol.*** 2018; 102(9):3939-49. (Invited Review).

18. **Hsueh YP**, Gronquist MR, Schwarz EM, Nath RD, *Lee CH*, Gharib S, Schroeder FC, Sternberg PW*. Nematophagous fungus Arthrobotrys oligospora mimics olfactory cues of sex and food to lure its nematode prey. ***eLife.*** 2017; 6e20023.

19. **Hsueh YP**, Mahanti P, Schroeder FC, Sternberg PW. Nematode-trapping fungi eavesdrop on nematode pheromones. ***Curr Biol***. 2013; 23(1):83-6.

20. Janbon G, Mullapudi N, Hon CC, Billmyre RB, Brunel F, Bahn YS, Chen W, Chen Y, Chow EW, Coppee JY, Floyd-Averette A, Gaillardin C, Gerik KJ, Goldberg J, Gonzalez-Hilarion S, Gujja S, Hamlin JL, **Hsueh YP**, Ianiri G, Jones S, Kodira CD, Kozubowski L, Lam W, Marra M, Mesner LD, Mieczkowski PA, Moyrand F, Nielsen K, Proux C, Rossignol T, Schein JE, Sun S, Wollschlaeger C, Wood IA, Zeng Q, Neuveglise C, Newlon CS, Perfect JR, Lodge JK, Idnurm A, Stajich JE, Kronstad JW, Sanyal K, Heitman J, Fraser JA, Cuomo CA, Dietrich FS. Analysis of the genome and transcriptome of Cryptococcus neoformans var. grubii reveals complex RNA expression and microevolution leading to virulence attenuation. ***PLoS Genet.*** 2014; 10(4):e1004261.

21. Voelz K, Ma H, Phadke S, Byrnes EJ, Zhu P, Mueller O, Farrer RA, Henk DA, Lewit Y, **Hsueh YP**, Fisher MC, Idnurm A, Heitman J, May RC. Transmission of hypervirulence traits via sexual reproduction within and between lineages of the human fungal pathogen *Cryptococcus gattii*. ***PLoS Genet***. 2013; 9(9):e1003771.

22. Findley K, Sun S, Fraser JA, **Hsueh YP**, Averette AF, Li W, Dietrich FS, Heitman J. Discovery of a modified tetrapolar sexual cycle in *Cryptococcus amylolentus* and the evolution of MAT in the *Cryptococcus* species complex. ***PLoS Genet***. 2012; 8(2):e1002528.

23. Sun S, **Hsueh YP**, Heitman J. Gene conversion occurs within the mating-type locus of Cryptococcus neoformans during sexual reproduction. ***PLoS Genet***. 2012; 8(7):e1002810

24. Wang X#, **Hsueh YP#**, Li W, Floyd A, Skalsky R, Heitman J. Sex-induced silencing defends the genome of Cryptococcus neoformans via RNAi. ***Genes Dev.*** 2010; 24(22):2566-82. (# equal contributions)

25. Xue C, Wang Y, **Hsueh YP**. Assessment of constitutive activity of a G protein-coupled receptor, CPR2, in Cryptococcus neoformans by heterologous and homologous methods. ***Methods Enzymol.*** 2010; 484:397-412.

26. **Hsueh YP**, Xue C, Heitman J. A constitutively active GPCR governs morphogenic transitions in Cryptococcus neoformans. ***EMBO J.*** 2009; 28(9):1220-33.

27. Velagapudi R, **Hsueh YP**, Geunes-Boyer S, Wright JR, Heitman J. Spores as infectious propagules of Cryptococcus neoformans. ***Infect Immun***. 2009; 77(10):4345-55.

28. Jain N, Li L, **Hsueh YP**, Guerrero A, Heitman J, Goldman DL, Fries BC. Loss of allergen 1 confers a hypervirulent phenotype that resembles mucoid switch variants of Cryptococcus neoformans. **Infect Immun**. 2009; 77(1):128-40.

29. **Hsueh YP**, Fraser JA, Heitman J. Transitions in sexuality: recapitulation of an ancestral tri- and tetrapolar mating system in Cryptococcus neoformans. Eukaryot Cell. 2008; 7(10):1847-55.

30. **Hsueh YP**, Heitman J. Orchestration of sexual reproduction and virulence by the fungal mating-type locus. ***Curr Opin Microbiol. 2008; 11(6):517-24.***

31. Xue C, **Hsueh YP**, Chen L, Heitman J. The RGS protein Crg2 regulates both pheromone and cAMP signalling in Cryptococcus neoformans. ***Mol Microbiol.*** 2008; 70(2):379-95.

32. Xue C, **Hsueh YP**, Heitman J. Magnificent seven: roles of G protein-coupled receptors in extracellular sensing in fungi. ***FEMS Microbiol Rev.*** 2008; 32(6):1010-32.

33. **Hsueh YP**, Xue C, Heitman J. G protein signaling governing cell fate decisions involves opposing Gα subunits in Cryptococcus neoformans. ***Mol Biol Cell.*** 2007; 18(9):3237-49.

34. **Hsueh YP**, Idnurm A, Heitman J. Recombination hotspots flank the *Cryptococcus* mating-type locus: implications for the evolution of a fungal sex chromosome. ***PLoS Genet.*** 2006; 2(11):e184.

35. **Hsueh YP**, Shen WC. A homolog of Ste6, the a-factor transporter in Saccharomyces cerevisiae, is required for mating but not for monokaryotic fruiting in *Cryptococcus neoformans*. ***Eukaryot Cell.*** 2005; 4(1):147-55.

Book Chapters

1. *Vidal-Diez de Ulzurrun G, Juan SC, Lin TH* and **Hsueh YP** (2024) Nematode-Trapping Fungi and Caenorhabditis elegans as a Model System for Predator–Prey Interactions. Chapter in *The Mycota* Vol. 9 Fungal Associations. Editors: YP Hsueh, M. Blackwell

2. **Hsueh YP**, Leighton DHW, and Sternberg, PW (2013). Nematode Communication, chapter in "Biocommunication of Animals", editor Witzany, G., Springer Netherlands.

3. **Hsueh YP**, Lin X, Kwon-Chung JK, and Heitman J (2010) Sexual reproduction of *Cryptococcus*, chapter in "*Cryptococcus:* from human pathogen to model yeast", editors: J. Heitman, T. Kozel, J. Kwon-Chung, J. Perfect, and A. Casadevall, ASM Press.

4. **Hsueh YP**, Metin B, Fraser JA, Findley KM, Rodriguez-Carres M, and Heitman J (2010) The mating-type locus of *Cryptococcus*: evolution of gene clusters, chapter in "*Cryptococcus:* from human pathogen to model yeast", editors: J. Heitman, T. Kozel, J. Kwon-Chung, J. Perfect, and A. Casadevall, ASM Press.

5. Fraser JA, **Hsueh YP**, Findley KM, and Heitman, J (2007) Evolution of the mating-type locus: the Basidiomycetes, chapter in "Sex in fungi: molecular determination and evolutionary implications", editors: Heitman, Kronstad, Taylor, and Casselton, ASM Press.

Book Editor

The Mycota Vol. 9 Fungal Associations; co-editor Meredith Blackwell (2024)

Funding - current and past

2024 - now **Max Planck Society**

2022-2026 **Academia Sinica Investigator Award** 中央研究院深耕計畫
I.D.# AS-IA-111-L02
Title: Molecular mechanism of prey-sensing, trap morphogenesis and evolution in nematode-trapping fungi.
*Terminated on Nov. 30 2024 due to new appointment at Max Planck Institute for Biology

2021-2024 **Ministry of Science and Technology**
I.D.# 110-2311-B-001-047-MY3
Title: Molecular genetics and genomics analyses of Pleurotus ostreatus mutants that lost toxicity to C. elegans.

2020 **Ministry of Science and Technology**
I.D.# 109-2311-B-001-023-
Title: Molecular interactions between nematode-trapping fungi and Caenorhabditis elegans.

2017-2021 **Academia Sinica Career Development Award** 中央研究院前瞻計畫
I.D.# CDA-104-L03
Title: Molecular mechanism of mushroom-triggered paralysis and killing in *C. elegans*.

2017-2020 **Ministry of Science and Technology**
I.D.# 106-2311-B-001-039-MY3
Title: Molecular mechanism of nematode-recognition in the nematode-trapping fungus *Arthrobotrys oligospora*.

2016 **Ministry of Science and Technology**
I.D.# 105-2311-B-001-044-MY2
Title: Molecular mechanism of nematode-triggered trap morphogenesis in nematode-trapping fungi.

Honors and Awards

2025 Outstanding Research Award, NSTC, Taiwan

2022 Academia Sinica Early-Career Investigator Research Achievement Award
中央研究院年輕學者研究成果獎

2022 Taiwan Outstanding Women in Science Award (Young Scientist Category) Wu Chien-Shiung Education Foundation and L'Oréal Tai wan 台灣傑出女科學家新秀獎

2021 Biomedical Young Scientist Award, Tie-Te Lee Biomedical Foundation
李天德青年醫藥科技獎

2020 EMBO Young Investigator Program 歐洲分子生物學組織年輕學者

2019 EMBO Global Investigator Network 歐洲分子生物學組織全球學者

2018 Taiwan Foundation for Advancement of Outstanding Scholarship

Yong Scholars' Creativity Award 傑出人才基金會年輕學者創新獎

2014 NIH/NIGMS Pathway to Independence (PI) K99 Award

2008 Genetics Society of America, DeLill Nasser Award

2007 Genetics Society of America, Fungal Genetics Meeting Travel Award

2003 Genetics Society of America, Fungal Genetics Meeting Travel Award

Community Service

Scientific meeting co-organizer
C. elegans Evolution Meeting, Vienna, Austria 2024
The Joint Yeast, Fungi, and Medical Mycology Conference in Taiwan, Taipei, Taiwan 2023

Scientific meeting session co-chair
International *C. elegans* Conference, Genetics Society of America 2017
International *C. elegans* Conference, Genetics Society of America 2019
Fungal Genetics Conferences, Genetics Society of America 2019

Poster Judge
International C. elegans Conference, Genetics Society of America 2019
Fungal Genetics Conferences, Genetics Society of America 2019

Committee member
Genetics Society of America, DeLill Nasser Award selection committee, 2019-2024

Reviewer
Reviewer for: Nature Communications, PNAS, Current Biology, Genetics, G3, PLoS Biology, PLoS Genetics, PLoS Pathogen, Scientific Reports, Frontiers journal series, Fungal Genetics and Biology, Journal of Fungi.

Invited talks

2025 (Scheduled)

International Fungal Biology Conference: from molecules to communities, Chania, Crete (September)

Mycological Society of America, **Karling Lecture**, Washinton State University, WA, USA (June)

Gordon Research Conference: Animal-microbe symbioses, **University of Southern Maine**, ME, USA (June)

Seminars in Microbiology, **Federal Institute of Technology Zurich** (ETH), Zurich, Switzerland (May)

2025

EMBO/EMBL symposium, Heidelberg, Germany (April)

17th European Conference on Fungal Genetics, Dublin, Ireland (March)

5th Bowei Research Conference: The magic of Chemistry, Taichung, Taiwan (January)

2024

EMBL symposium: Biology outside of the box, Heidelberg, Germany (December)

EMBO 60 meeting, Heidelberg, Germany (October)

Kiel Conference: Molecular Biology of Fungi, **Kiel University**, Kiel, Germany (September) (Keynote speaker)

Division of Biology and Biological Engineering, **California Institute of Technology**, CA, USA (March)

Fred Hutchinson Cancer Center, Seattle, WA, USA (March)

32nd Fungal Genetics Conference, **Genetic Society of America**, Asilomar CA, USA (March) (Invited Plenary speaker)

2023

Academia Sinica Open House, Taipei, Taiwan (October)

The Joint Conference of Yeast, Fungi and Medical Mycology, Taipei, Taiwan (September)
Institute of Molecular Biology and Genetics, **Seoul National University**, Seoul, Korea (September)

The 20th International Microscopy Congress, Busan, Korea (September)

24th International *C. elegans* Conferences, Glasgow, UK (June)

EMBO YIP Annual Meeting, IFOM, Milan, Italy (May)

MycoTalks seminar series, MRC Centre for Medical Mycology, **University of Exeter**, UK. (April, online)

Department of Biochemistry and Biotechnology, **National Chia-Yi University**, Chia-Yi, Taiwan (April)

Department of Life Science, **National Yang Ming Chiao Tung University,** Taipei, Taiwan (April)

EMBO-India Research Partnership, **IGIB**, Delhi, **IMTECH**, Chandigarh and **IICB**, Kolkata, India (27 February-3 March)

Max Planck Institute for Biology, Tubingen, Germany. (February)

Department of Molecular Genetics, **University of Toronto**, Toronto, Canada. (January)

2022

Department of Biochemistry and Molecular Cell Biology, School of Medicine, **Taipei Medical University**, Taipei, Taiwan (December)

Max Planck Institute for Biology, Tubingen, Germany (November, online)

Asia Pacific *C. elegans* meeting, Hong Kong (July, online)

Seminar, **Max Planck Institute for Terrestrial Microbiology**, Marburg, Germany (April)

Annual Conference, **The Microbiology Society**, Belfast, UK (April)

Institute of Biochemistry and Molecular Biology, College of Medicine, **National Taiwan University** (January)

2021 (online)

Department of Life Science, **National Tsing Hua University**, Hsinchu, Taiwan (November)

Institute of Plant Science and Resources, **Okayama University**, Japan (September)

International Congress of AsiaEvo 2nd Symposium of Revolution of Evolutionary Approaches on Complex Phenotypes, **The University of Tokyo**, Japan (August)

Koret School of Veterinary Medicine, **The Hebrew University of Jerusalem**, Israel (June)

EMBO YIP meeting, **EMBL**, Heidelberg, Germany (June)

Institute of Microbiology and Infection, **University of Birmingham**, Birmingham, United Kingdom (February)

2020

Institute of Biomedical Engineering, **National Tsing Hua University**, Hsinchu, Taiwan. (November)

EMBO Young Investigator candidate talk, **EMBL**, Heidelberg, Germany. (November, online)

Department of Plant Pathology and Microbiology, **National Taiwan University**, Taipei, Taiwan (October)

Institute of Plant and Microbial Biology, **Academia Sinica**, Taipei, Taiwan (October)

Taiwan Society of Mycology annual meeting, Taipei, Taiwan (October)

36th Taiwan Biology Retreat, Taipei, Taiwan (August)

Fungi in the Living Room seminar series, **Max Planck Institute for Evolution** (June, online)

The Allied Genetics Conference 2020, **Genetics Society of America**, Washington DC, USA (April, online)

15thEuropean Fungal Genetics Meeting, Rome, Italy (February, plenary talk)

2019

Department of Biology, **New York University**, New York, USA (November)

EMBO Global Investigator candidate talk, **EMBL**, Heidelberg, Germany (November)

Seminar at Graduate School of Agriculture, **Kyoto University**, Kyoto, Japan (October)

Seminar at Biotechnology Research Center, **University of Tokyo**, Tokyo, Japan (June)

30thGenetics Society of America Fungal Genetics Meeting, Asilomar, CA, USA (March)

2018

EMBO Conference, Experimental Approaches to Evolution and Ecology Using Yeast and Other Model Systems, EMBL, Heidelberg, Germany (October)

Seminar at **Max Planck Institute for Terrestrial Microbiology**, Marburg, Germany (October)

Seminar at **California Institute of Technology**, Pasadena, CA, USA (June)

Seminar at **Harbor-UCLA Medical Center**, Torrance, CA, USA (June)

Gordon Research Conference in Molecular and Cellular Fungal Biology, NH, USA (June)

Taiwan Society of Microbial Ecology annual meeting (June)

Seminar at Graduate School of Agriculture, **Kyoto University**, Kyoto, Japan (May)

Seminar at **Weizmann Institute of Science**, Rehovot, Israel (March)

14thEuropean Fungal Genetics Meeting, Haifa, Israel (March)

2017

International Symposium on Evolutionary Genomics and Bioinformatics, **Taiwan Society of Evolution and Computational Biology** (November)

Taiwan Agricultural Research Institute (May)

Institute of Plant and Microbial Biology, **Academia Sinica** (May)

Institute of Ecology and Evolution, **National Taiwan University** (April)

29thGenetics Society of America Fungal Genetics Meeting, Asilomar, CA, USA (March)

Department of Life Science, **National Yang-Ming University** (March)

Department of Life Science, **National Taiwan University** (March)

Department of Life Science, **National Tsing Hua University** (February)

Department of Life Science, **National Central University** (January)

2016

Department of Entomology, **National Taiwan University** (December)

Academia Sinica Open House, Taiwan (October)

Department of Plant Pathology, **National Chung-Hsing University**, Taichung, Taiwan (October)

Taiwan Mycological Society Meeting (October)

Seminar at **University of Göttingen**, Göttingen, Germany (August)

Taiwan Developmental Biology Society Meeting (August)

16th International *C. elegans* Neuroscience Meeting, **Nagoya University**, Japan (July)

Department of Chemistry, **National Taiwan University**, Taiwan (May)

Department of Entomology, **National Chung-Hsing University**, Taiwan (March)