

薛雁冰
中央研究院分子生物研究所

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Born

May 9th, 1979 in Taipei, Taiwan

Education

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

Duke University, Ph.D. 2008
Molecular Genetics and Microbiology

Research Experience

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

Academic Positions

2020-present
Associate Research Fellow, Institute of Molecular Biology, Academia Sinica
2015-2020
Assistant Research Fellow, Institute of Molecular Biology, Academia Sinica

Publications (*Correspondence; members in my own laboratory in *italics*)

1. *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
 - Genetics Issue Highlight
2. *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.
3. *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.
4. *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.
5. *Lin HC, Hsueh YP** Laboratory Maintenance and Culturing of the Nematode-Trapping Fungus *Arthrobotrys oligospora*. **Curr Protoc.** 2021;1(2):e41.
6. *Tsai CE, Yang FJ, Lee CH, YP Hsueh, CJ Kuo, CS Chen**. The conserved regulator of autophagy and innate immunity *h1h-30/TFEB* mediates tolerance of enterohemorrhagic *Escherichia coli* in *Caenorhabditis elegans*. **Genetics** 2021; 217 (1) iyaa034
7. *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
8. *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
9. 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 contribution)
 10. 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. (One of the Cover Stories)
 - Recommended by F1000
 - Commentary: Renahan T. and Sommer RJ. Mechanism of murderous mushrooms paves path for parasitic helminth halt. **PNAS** 117 (13) 6974-6975
 11. 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
(https://www.eurekalert.org/pub_releases/2019-10/p-ft102419.php)
 12. 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.
 13. 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)
 14. 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;6:e20023
 15. Hsueh YP, Mahanti P, Schroeder FC, Sternberg PW. Nematode-trapping fungi eavesdrop on nematode pheromones. **Curr Biol.** 2013;23(1):83-6
 16. 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
 17. 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.
 18. 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 amyloletus* and the evolution of MAT in the *Cryptococcus* species complex. **PLoS Genet.** 2012;8(2):e1002528
 19. 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. Epub 2012/07/14. doi: 10.1371/journal.pgen.1002810.
 20. 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 contribution
 21. 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
 22. Hsueh YP, Xue C, Heitman J. A constitutively active GPCR governs morphogenic transitions in *Cryptococcus neoformans*. **EMBO J.** 2009;28(9):1220-33.

23. 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.
24. 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.
25. **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.
26. **Hsueh YP**, Heitman J. Orchestration of sexual reproduction and virulence by the fungal mating-type locus. **Curr Opin Microbiol**. 2008;11(6):517-24.
27. 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
28. 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
29. **Hsueh YP**, Xue C, Heitman J. G protein signaling governing cell fate decisions involves opposing G α subunits in *Cryptococcus neoformans*. **Mol Biol Cell**. 2007;18(9):3237-49
30. **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.
31. **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

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

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.

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.

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.

Current and past grants

2022 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

2021 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 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 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

2014 NIH/NIGMS Pathway to Independence (PI) K99 Award
I.D.# 1K99GM108867-1
Title: Molecular genetics of interactions between *C. elegans* and nematophagous fungi

Honors and Awards

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

2020 EMBO Young Investigator

2019 EMBO Global Investigator

2019 Future Leader of The STS Forum, Japan

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)

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

International Community Service

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 2019-2021

Editor and Reviewer

Review editor: Frontiers in Cellular and Infection Microbiology, 2019-present

Reviewers: Nature Communications, PNAS, Genetics, G3, PLoS Genetics, PLoS Pathogen,

Scientific Reports, Frontiers journal series, Fungal Genetics and Biology, Journal of Fungi

Invited International Conferences and Seminars

2022

Annual Conference, The Microbiology Society, Belfast, UK, Apr. (scheduled)

2021

Institute of Plant Science and Resources, **Okayama University**, Japan, Sep. (*online*)

International Congress of AsiaEvo 2nd, symposium of Revolution of evolutionary approaches on complex phenotypes, **The University of Tokyo**, Japan, Aug (*online*) (scheduled)

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

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

Institute of Microbiology and Infection, **University of Birmingham**, Birmingham, United Kingdom, Feb. (*online*)

2020

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

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

Department of Molecular Genetics and Microbiology at **Duke University**, Durham, USA, Apr. 2020 (*anceled due to Covid-19*)

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

15th **European Fungal Genetics Meeting**, Rome, Italy, Feb. 2020 (*plenary talk*)

2019

Department of Biology, **New York University**, New York, USA, Nov.

EMBO Global Investigator candidate talk, **EMBL**, Heidelberg, Germany, Nov.

Seminar at Graduate School of Agriculture, **Kyoto University**, Kyoto, Japan, Oct.

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

30th **Genetics Society of America** Fungal Genetics Meeting, Asilomar, CA, USA, Mar.

2018

EMBO Conference, Experimental Approaches to Evolution and Ecology Using Yeast and Other Model Systems, **EMBL**, Heidelberg, Germany, Oct.

Seminar at **Max Planck Institute for Terrestrial Microbiology**, Marburg, Germany, Oct.

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

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

Seminar at **Weizmann Institute of Science**, Rehovot, Israel, Mar.

14th **European Fungal Genetics Meeting**, Haifa, Israel, Mar.

2017

29th **Genetics Society of America** Fungal Genetics Meeting, Asilomar, CA, USA, Mar.

2016

Seminar at **University of Göttingen**, Göttingen, Germany, Aug.

16th International *C. elegans* Neuroscience meeting, **Nagoya University**, Japan, July

Invited Local Conferences and Seminars in Taiwan

2021

Department of Life Science, National Tsing Hua University, Nov.

2020

Institute of Biomedical Engineering, National Tsing Hua University, Nov.
Department of Plant Pathology and Microbiology, National Taiwan University, Oct.
Institute of Plant and Microbial Biology, Academia Sinica, Oct.
Taiwan Society of Mycology annual meeting, Oct.
36th Taiwan Biology Retreat, Aug.

2018

Taiwan Society of Microbial Ecology annual meeting, June

2017

International Symposium on Evolutionary Genomics and Bioinformatics, Taiwan Society of Evolution and Computational Biology Nov.
Taiwan Agricultural Research Institute, May
Institute of Plant and Microbial Biology, Academia Sinica, May
Institute of Ecology and Evolution, National Taiwan University, Apr.
Department of Life Science, National Yang-Ming University, Mar.
Department of Life Science, National Taiwan University, Mar.
Department of Life Science, National Tsing Hua University, Feb.
Department of Life Science, National Central University, Jan.

2016

Department of Entomology, National Taiwan University, Dec.
Academia Sinica Open House, Oct.
Department of Plant Pathology, National Chung-Hsing University, Oct.
Taiwan Mycological Society Meeting, Oct.
Taiwan Developmental Biology Society meeting, Aug.
Department of Chemistry, National Taiwan University, May
Department of Entomology, National Chung-Hsing University, Mar.

2015

Biodiversity Research Center, Academia Sinica, Dec.
Taiwan Mycological Society Meeting, Nov.
Department of Biochemical Science and Technology, National Taiwan University, Nov.
Department of Life Science, National Taiwan Normal University, Oct.