

CHANG-YU CHANG 張昌祐

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I am an evolutionary ecologist studying microbial symbiosis and community assembly. My research aims to develop a quantitative and predictive understanding of the emergent properties in host-microbe symbiosis.

Keywords: community ecology, evolutionary genomics, plant-microbe symbiosis, computational biology

RESEARCH EXPERIENCE

Biodiversity Research Center, Academia Sinica, TW Assistant Research Fellow	Principal Investigator	2025-present
University of Pennsylvania, PA, USA Postdoctoral Researcher Data Driven Discovery Postdoctoral Fellow “Evolutionary Genomics of Microbial Symbiosis”	Advisor: Dr. Corlett Wood	2022-2025

EDUCATION

Yale University, CT, USA Ph.D. in Ecology and Evolutionary Biology “Engineering the Emergent Properties of Complex Communities”	Advisor: Dr. Alvaro Sanchez	2022
National Taiwan University, TW M.S. in Ecology and Evolutionary Biology “Ecological Drivers for the Evolution of Near Infrared Photoreception in Burying Beetles”	Advisor: Dr. Sheng-Feng Shen	2017
National Taiwan University, TW B.S. in Life Science	ranking top 5% in the class GPA: 4.1/4.3	2015

PUBLICATIONS

- Chang, C.-Y., Topping-Brown, T., Rud, J. L., Calvert, M. B., Bencosme, G., & Wood, C. W. (2025). Biogeographic and genomic signatures of thermal adaptation in facultative rhizobia. *Biorxiv*, 2025.
- Chang, C.-Y., Bajić, D., Vila, J. C. C., Estrela, S., & Sanchez, A. (2023). Emergent coexistence in multispecies microbial communities. *Science*, 381(6655), 343–348.
- Diaz-Colunga, J., Lu, N., Sanchez-Gorostiaga, A., Chang, C.-Y., Cai, H. S., Goldford, J. E., Tikhonov, M., & Sánchez, Á. (2022). Top-down and bottom-up cohesiveness in microbial community coalescence. *Proc. Natl. Acad. Sci. U. S. A.*, 119(6).
- Estrela, S., Vila, J. C. C., Lu, N., Bajić, D., Rebolleda-Gómez, M., Chang, C.-Y., Goldford, J. E., Sanchez-Gorostiaga, A., & Sánchez, Á. (2021). Functional attractors in microbial community assembly. *Cell Syst*, 0(0).
- Chang, C.-Y., Vila, J. C. C., Bender, M., Li, R., Mankowski, M. C., Bassette, M., Borden, J., Golfier, S., Sanchez, P. G. L., Waymack, R., Zhu, X., Diaz-Colunga, J., Estrela, S., Rebolleda-Gomez, M., & Sanchez, A. (2021). Engineering complex communities by directed evolution. *Nat Ecol Evol*, 5(7), 1011–1023.
- Sánchez, Á., Vila, J. C. C., Chang, C.-Y., Diaz-Colunga, J., Estrela, S., & Rebolleda-Gomez, M. (2021). Directed Evolution of Microbial Communities. *Annu. Rev. Biophys.*, 50, 323–341.
- Chang, C.-Y., Osborne, M. L., Bajic, D., & Sanchez, A. (2020). Artificially selecting bacterial communities using propagule strategies. *Evolution*.
- Baskerville, M., Biro, A., Blazanin, M., Chang, C.-Y., Hallworth, A., Sonnert, N., Vila, J. C. C., & Sanchez, A. (2018). Ecological effects of cellular computing in microbial populations. *Nat. Comput.*, 1–12.

FELLOWSHIPS

Data-Driven Discovery Postdoctoral Fellow University of Pennsylvania, \$27,500	2022-2024
Government Fellowship for Oversea Study Taiwan Ministry of Education, \$126,000	2017-2020

PRESENTATIONS

Invited Seminars

Department of Microbiology, University of Pennsylvania	2025
Institute of Molecular Biology, Academia Sinica	2025
Institute of Plant and Microbial Biology, Academia Sinica	2024
Institute of Ecology and Evolutionary Biology, National Taiwan University	2023
Biodiversity Research Center, Academia Sinica	2023
Department of Ecology and Evolutionary Biology, Princeton University	2021
Department of Biology, University of Pennsylvania	2021
International Centre for Theoretical Physics, UNESCO	2021
Microbial Sciences Institute, Yale University	2020

Contributed Presentations

Symposium talk ESA 2024, Long Beach, CA	2024
Contributed poster Evolution 2024, Montreal, QC	2024
Contributed talk Evolution 2023, Albuquerque, NM	2023
Contributed talk ASN, Asilomar, CA Honorable mention postdoc presentation	2023
Contributed talk Connections Across Borders Conference Travel grant \$250 & Yale GSA CTF \$750	2022
Contributed talk Evolution 2022, Cleveland, OH	2022
Contributed poster Yale Microbial Sciences Institute Retreat	2019
Contributed poster Yale EEB graduate student symposium Best poster presentation	2019
Contributed poster ISME17, Leipzig, Germany	2019
Contributed talk 18th CABE, Kaohsiung, Taiwan Winner prize for oral presentation	2017
Contributed talk 15th ISBE, Exeter, UK	2016
Contributed poster NTU Graduate student symposium, Taipei, Taiwan Best poster presentation	2016

TEACHING & MENTORSHIP

Mentorship

Undergrad mentor Anisa Robinson University of Pennsylvania	2025
Undergrad thesis co-mentor Jazmine Rud University of Pennsylvania	2023
FERBS mentor Nehemias Abundo Quiroz University of Pennsylvania	2023
Undergrad thesis mentor Helen Cai Yale University	2020

Guest Lectures and TA-ships

Guest lecturer Evolutionary Biology, University of Pennsylvania	2023
TA Microbial Ecology and Evolution, Yale University	2021
TA Ecology and Evolutionary Biology, Yale University	2020
TA Biology of Terrestrial Arthropods, Yale University	2019
TA Lab for Biology of Terrestrial Arthropods, Yale University	2019
TA Lab for Evolution and Functional Traits, Yale University	2019
TA Physical Biology of the Cell summer course, Woods Hole	2019
Guest lecturer Modeling for Biologists, National Taiwan University	2017
TA Biostatistics, National Taiwan University	2016
TA Lab for General Botany, National Taiwan University	2015

SERVICES & OUTREACHES

Manuscript reviewer for: Ecology Letters, Ecology, IScience, Nature Communications, Plant and Soil, Ecography, ISME Communications, Environmental Microbiology, PNAS, Microbial Ecology

Conferences, Symposia, and Profession Societies

Symposium Co-organizer “Emergent Coexistence in Microbial Communities and Beyond”, ESA	2024
Bilingual mentor Evolution 2022-2024	2022-2024

SKILLS

Programming: R, Linux, Python, Git, LaTeX

Language: Mandarin (native), English (profession), Japanese (elementary)

REFERENCES

Dr. Corlett Wood | Assistant Professor

Department of Biology
University of Pennsylvania
corlett@sas.upenn.edu

Dr. Maria Rebolleda-Gomez | Assistant Professor

Department of Ecology and Evolutionary Biology
University of California, Irvine
mrebol1@uci.edu

Dr. Sheng-Feng Shen | Research Fellow

Biodiversity Research Center
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Dr. Alvaro Sanchez | Principal investigator

Institute of Functional Biology and Genomics
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Dr. Mong-Hsun Tsai | Professor

Institute of Biotechnology
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Dr. David Vasseur | Professor

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Yale University
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