

Fay-Wei Li

email: fl329@cornell.edu | lab website: fernway.net

EDUCATION AND PROFESSIONAL HISTORY

2023 – Associate Professor, Boyce Thompson Institute
2023 – Adjunct Associate Professor, Plant Biology Section, Cornell University
2017 – Assistant Professor, Boyce Thompson Institute
2017 – Adjunct Assistant Professor, Plant Biology Section, Cornell University
2016 – 2017 Postdoctoral Researcher, University of Zurich
2015 – 2016 Postdoctoral Researcher, UC Berkeley
2010 – 2015 Ph.D., Department of Biology, Duke University
2009 – 2010 Tank platoon commander/Ammunition officer, 2nd lieutenant, ROC Army, Taiwan
2005 – 2009 B.S., Department of Life Science, National Taiwan University

SELECTED PUBLICATIONS (lab members in **bold**)

Robison, T.A., Z.G. Oh, **D. Lafferty**, **X. Xu**, J.C.A. Villarreal, L.H. Gunn#, **F.-W. Li**#. Hornworts reveal a spatial model for pyrenoid-based CO₂-concentrating mechanisms in land plants. **Nature Plants** in press.
#Corresponding authors

Schafran, P.#, **D.A. Hauser**, **J.M. Nelson**, **X. Xu**, L.A. Mueller, S. Kulshrestha, I. Smalley, S. de Vries, I. Irisarri, J. de Vries, K. Davies, J.C.A. Villarreal, **F.-W. Li**#. Pan-phylum genomes of hornworts reveal conserved autosomes but dynamic accessory and sex chromosomes. **Nature Plants** in press.
#Corresponding authors

Oh, Z.G., **T.A. Robison**, **D.H. Loh**, **W.S.L. Ang**, J. Ng, **F.-W. Li**#, L.H. Gunn#. A synthetic biology window to probe hornwort Rubisco divergent biogenesis requirements and kinetics. **Molecular Plant** in press.
#Corresponding authors

Lafferty, D.C., **T.A. Robison**, **A. Gunadi**, **P.W. Schafran**, L.H. Gunn, J. Van Eck, **F.-W. Li**. 2024. Biolistic-mediated transformation of hornworts and its application to study pyrenoid protein localization. **Journal of Experimental Botany** 75: 4760–4771.

Suissa, J.S., **F.-W. Li**, C.S. Moreau. 2024. Convergent evolution of nectaries in ferns and the co-option of ant bodyguards from flowering plants. **Nature Communications** 15: 4392.

Li, C.*, **D. Wickell***, **L.-Y. Kuo**, X. Chen, B. Nie, X. Liao, D. Peng, J. Ji, J. Jenkins, M. Williams, S. Shu, C. Plott, K. Barry, S. Rajasekar, J. Grimwood, X. Han, S. Sun, Z. Hou, W. He, G. Dai, C. Sun, J. Schmutz, J.H. Leebens-Mack, **F.-W. Li**#, L. Wang#. 2024. Extraordinary preservation of gene collinearity over three hundred million years revealed in homosporous lycophytes. **Proceedings of the National Academy of Sciences USA** 121: e2312607121.

*Equally contributed; #Corresponding authors

Li, F.-W. 2023. The chromosome hoarding syndrome of (some) ferns and lycophytes. **Nature Reviews Genetics** 24: 735–737.

Rahmatpour, N., **L.-Y. Kuo**, J. Kang, E. Herman, L. Lei, M. Li, S. Srinivasan, R. Z, S.M. Wolniak, C. Delwiche, S. Mount, **F.-W. Li**. 2023. Analyses of *Marsilea vestita* genome and transcriptomes do not support widespread intron retention during spermatogenesis. **New Phytologist** 237: 1490–1494.

Huang, X.*, W. Wang*, T. Gong*, **D. Wickell***, L.-Y. Kuo, X. Zhang, J. Wen, H. Kim, F. Lu, H. Zhao, S. Chen, H. Li, W. Wu, C. Yu, S. Chen, W. Fan, S. Chen, X. Bao, L. Li, D. Zhang, L. Jiang, X. Yan, Z. Liao, G. Zhou, Y. Guo, J. Ralph, R.R. Sederoff, H. Wei#, P. Zhu#, **F.-W. Li#**, R. Ming#, Q. Li#. 2022. The flying spider-monkey tree fern genome provides insights into fern evolution and arborescence. **Nature Plants** 8: 500–512.

Cover

*Equally contributed; #Corresponding authors

Featured in: [New York Times](#), [Scientific American](#), [Science](#)

Robison, T.A., J.M. Nelson, D.A. Hauser, L.A. Lewis, **F.-W. Li**. 2022. Dynamic plastid and mitochondrial genomes in Chaetopeltidales (Chlorophyceae) and characterization of a new chlorophyte taxon. **American Journal of Botany** 6: 939–951.

Featured in: [The Hill](#), [Slate](#), [Blavity](#), [Cornell Chronicle](#)

Wickell, D., L.-Y. Kuo, H.-P. Yang, A.D. Ashok, I. Irisarri, A. Dadras, S. de Vries, J. de Vries, Y.-M. Huang, Z. Li, M.S. Barker, N.T. Hartwick, T.P. Michael, **F.-W. Li**. 2021. Underwater CAM photosynthesis elucidated by *Isoetes* genome. **Nature Communications** 12: 6348.

Rahmatpour, N., D.A. Hauser, J.M. Nelson, P.Y. Chen, J.C. Villarreal, M.-Y. Ho, **F.-W. Li**. 2021. A novel thylakoid-less isolate fills a billion-year gap in the evolution of Cyanobacteria. **Current Biology** 31: 2857–2867. **Cover**

Featured in: [Current Biology Dispatch](#)

Szövényi, P., **A. Gunadi, F.-W. Li**. 2021. Charting the genomic landscape of seed-free plants. **Nature Plants** 7: 554–565.

Nelson, J.M., D.A. Hauser, F.-W. Li. 2021. The diversity and community structure of symbiotic cyanobacteria in hornworts inferred from long-read amplicon sequencing. **American Journal of Botany** 108: 1731–1744.

Li, F.-W., T. Nishiyama, M. Waller, E. Frangedakis, J. Keller, Z. Li, N. Fernandez-Pozo, M.S. Barker, T. Bennett, M.A. Blázquez, S. Cheng, A.C. Cuming, J. de Vries, S. de Vries, P.-M. Delaux, I.S. Diop, J. Harrison, **D. Hauser**, J. Hernández-García, A. Kirbis, J.C. Meeks, I. Monte, S.K. Mutte, A. Neubauer, D. Quandt, **T. Robison**, M. Shimamura, S.A. Rensing, J.C. Villarreal, D. Weijers, S. Wicke, G.K.-S. Wong, K. Sakakibara, P. Szövényi. 2020. *Anthoceros* genomes illuminate the origin of land plants and the unique biology of hornworts. **Nature Plants** 6: 259–272.

Li, F.-W., P. Brouwer, L. Carretero-Paulet, S. Cheng, J. de Vries, P.-M. Delaux, A.N. Eily, N. Koppers, **L.-Y. Kuo**, Z. Li, M. Simenc, I. Small, E. Wafula, S. Angarita, M.S. Barker, A. Braeutigam, C. dePamphilis, S. Gould, P.S. Hosmani, Y.-M. Huang, B. Huettel, Y. Kato, X. Liu, S. Maere, R. McDowell, L.A. Mueller, K.G.J. Nierop, S.A. Rensing, T. Robison, C.J. Rothfels, E.M. Sigel, Y. Song, P.R. Timilsina, Y. Van de Peer, H. Wang, P. K.I. Wilhelmsson, P.G. Wolf, X. Xu, J.P. Der, H. Schluepmann, G.K.-S. Wong, and K.M. Pryer. 2018. Fern genomes elucidate land plant evolution and cyanobacterial symbioses. **Nature Plants** 4: 460–472. **Cover**

Featured in: [Discover Magazine](#), [Mongabay](#), [Faculty of 1000](#), [Nature Plants News & Views](#), [Der Spiegel](#)

Li, F.-W., J.C. Villarreal, P. Szovenyi. 2017. Hornworts, an overlooked window into carbon-concentrating mechanism. **Trends in Plant Science** 22: 275–277.

Li, F.-W., M. Melkonian, C.J. Rothfels, J.C. Villareal, D. Stevenson, S.W. Graham, G.K.-S. Wong, K.M. Pryer, S. Mathews. 2015. Phytochrome diversity in green plants and the origin of canonical plant phytochromes. **Nature Communications** 6: 7852.

Li, F.-W., J.C. Villarreal, S. Kelly, C.J. Rothfels, M. Melkonian, E. Frangedakis, M. Ruhsam, E. M. Sigel, J.P. Der, J. Pittermann, D.O. Burge, L. Pokorny, A. Larsson, T. Chen, S. Weststrand, P. Thomas, E. Carpenter, Y. Zhang, Z. Tian, L. Chen, Z. Yan, Y. Zhu, X. Sun, J. Wang, D.W. Stevenson, B.J. Crandall-Stotler, A.J. Shaw, M.K. Deyholos, D.E. Soltis, S.W. Graham, M.D. Windham, J.A. Langdale, G.K.S. Wong, S. Mathews & K.M. Pryer. 2014. Horizontal transfer of an adaptive chimeric photoreceptor from bryophytes to ferns.

Proceedings of the National Academy of Sciences USA 111: 6672–6677.

Featured in: [New York Times](#), [The Economist](#), [National Geographic](#), [Scientific American](#), [Faculty of 1000](#), [Current Biology](#), [Nature Reviews Genetics](#)

Li, F.-W., K.M. Pryer, M.D. Windham. 2012. *Gaga*, a new genus segregated from *Cheilanthes* (Pteridaceae). **Systematic Botany** 37: 845-860.

Featured in: [New York Times](#), [Rolling Stone](#), [Huffington Post](#), [Wired](#), [The Guardian](#)

COMPLETE PUBLICATION LIST (lab members in **bold**)

IN PRESS/IN REVIEW

Robison, T.A., Z.G. Oh, **D. Lafferty**, **X. Xu**, J.C.A. Villarreal, L.H. Gunn#, **F.-W. Li**#. Hornworts reveal a spatial model for pyrenoid-based CO₂-concentrating mechanisms in land plants. **Nature Plants** in press.
#Corresponding authors

Schafraan, P.#, **D.A. Hauser**, **J.M. Nelson**, **X. Xu**, L.A. Mueller, S. Kulshrestha, I. Smalley, S. de Vries, I. Irisarri, J. de Vries, K. Davies, J.C.A. Villarreal, **F.-W. Li**#. Pan-phylum genomes of hornworts reveal conserved autosomes but dynamic accessory and sex chromosomes. **Nature Plants** in press.
#Corresponding authors

Oh, Z.G., **T.A. Robison**, **D.H. Loh**, **W.S.L. Ang**, J. Ng, **F.-W. Li**#, L.H. Gunn#. A synthetic biology window to probe hornwort Rubisco divergent biogenesis requirements and kinetics. **Molecular Plant** in press.
#Corresponding authors

Uveges, B., K.L. Sparks, **W.S. Ang**, H. Monti, **F.-W. Li**, J.P. Sparks. Contamination of commercial ¹⁵N₂: potential impacts on nitrogen fixation assays and a simple method for quantification. in review.

Peñaloza-Bojacá, G., A. Maciel-Silva, D.C. Cargill, D. Bell, E.B. Sessa, **F.-W. Li**, J.G. Burleigh, S.F. McDaniel, E.C. Davis, L. Endara, N. Salazar, **P. Schafraan**, S. Chantanaorrapint, J. Duckett, S. Pressel, C. Solís-Lemus, K. Renzaglia, J.C. Villarreal. Ancient reticulation, incomplete lineage sorting and the evolution of the pyrenoid at the dawn of hornwort diversification. **Annals of Botany** in review.

Song, M.J., **F.-W. Li**, F. Freund, C.M. Tribble, E. Toffelmier, C. Miller, H.B. Shaffer, C.J. Rothfels. The nitrogen-fixing fern *Azolla* has a complex microbiome characterized by multiple modes of transmission. **American Journal of Botany** in review.

Song, M.J., **F.-W. Li**, F. Freund, M. Escalona, E. Toffelmier, C. Miller, H.B. Shaffer, O. Nguyen, M.P.A. Marimuthu, N. Chumchim, C.M. Tribble, C.W. Fairbairn, W. Seligmann, C.J. Rothfels. The genome assembly of the duckweed fern, *Azolla caroliniana*. **Journal of Heredity**, in review.

Ang, W.S.L., M.M. Blaszyński, J.B. Cai, L.M. Markowitz, E.A. Maunders, A. Norlin, H.R. Womack, **F.-W. Li**. Genome sequences of two *Nostoc* strains isolated from hornworts. **Microbiology Resource Announcements**, in review.

2024

Suissa, J.S., **F.-W. Li**, C.S. Moreau. 2024. Convergent evolution of nectaries in ferns and the co-option of ant bodyguards from flowering plants. **Nature Communications** 15: 4392.

Li, C.* , **D. Wickell***, **L.-Y. Kuo**, X. Chen, B. Nie , X. Liao, D. Peng, J. Ji, J. Jenkins, M. Williams, S. Shu, C. Plott, K. Barry, S. Rajasekar, J. Grimwood, X. Han, S. Sun, Z. Hou, W. He, G. Dai, C. Sun, J. Schmutz , J.H. Leebens-Mack, **F.-W. Li#**, L. Wang#. 2024. Extraordinary preservation of gene collinearity over three hundred million years revealed in homosporous lycophytes. **Proceedings of the National Academy of Sciences USA** 121: e2312607121.

*Equally contributed; #Corresponding authors

Wickell, D., J. Landis, E. Zimmer. **F.-W. Li**. 2024. Population genomics of the *Isoetes appalachiana* (Isoetaceae) complex supports a ‘diploids-first’ approach to conservation. **Annals of Botany** 133: 261–272.

Lafferty, D.C., **T.A. Robison**, **A. Gunadi**, P.W. Schafran, L.H. Gunn, J. Van Eck, **F.-W. Li**. 2024. Biolistic-mediated transformation of hornworts and its application to study pyrenoid protein localization. **Journal of Experimental Botany** 65: 243.

Feng, X., J. Zheng, I. Irisarri, H. Yu, B. Zheng, Z. Ali, S. de Vries, J. Keller, J.M.R. Fürst-Jansen, A. Dadras, J.M.S. Zegers, T.P. Rieseberg, A.D. Ashok, T. Darienko, M.J. Bierenbroodspot, L. Gramzow, R. Petroll, F.B. Haas, N. Fernandez-Pozo, O. Nousias, T. Li, E. Fitzek, W.S. Grayburn, N. Rittmeier, C. Permann, F. Rümpler, J. M. Archibald, G. Theißen, J. P. Mower, M. Lorenz, H. Buschmann, K. von Schwartzberg, L. Boston, R.D. Hayes, C. Daum, K. Barry, I.V. Grigoriev, X. Wang, **F.-W. Li**, S.A. Rensing, J.B. Ari, N. Keren, A. Mosquna, A. Holzinger, P.-M. Delaux, C. Zhang, J. Huang, M. Mutwil, J. de Vries, Y. Yin. 2024. Chromosome-level genomes of multicellular algal sisters to land plants illuminate signaling network evolution. **Nature Genetics** 56: 1018–1031.

Lane, C, Y.A. Shoffe, **P. Schafran**, **F.-W. Li**, J. Kao-Kniffin, C. Watkins. 2024. Amplicon sequencing and shotgun metagenomics reveal functional impacts of aminoethoxyvinylglycine-mediated ripening and cold storage on the microbiome of ‘NY1’ apples. **Postharvest Biology and Technology** 213: 112969.

2023

Li, F.-W. 2023. The chromosome hoarding syndrome of (some) ferns and lycophytes. **Nature Reviews Genetics** 24: 735–737.

Rahmatpour, N., **L.-Y. Kuo**, J. Kang, E. Herman, L. Lei, M. Li, S. Srinivasan, R. Z, S.M. Wolniak, C. Delwiche, S. Mount, **F.-W. Li**. 2023. Analyses of *Marsilea vestita* genome and transcriptomes do not support widespread intron retention during spermatogenesis. **New Phytologist** 237: 1490–1494.

Schafran, P., **F.-W. Li**, C.J. Rothfels. 2023. PURC: a program for improved sequence inference for polyploid phylogenetics and other manifestations of the multiple-copy problem. **Methods in Molecular Biology** 2545: 189–206.

Hisanaga, T., S. Wu, **P. Schafran**, E. Axelsson S. Akimcheva, L. Dolan, **F.-W. Li**, F. Berger. 2023. The ancestral chromatin landscape of land plants. **New Phytologist** 240: 2085–2101.

Jiang, H.-W., H.-Y. Wu, C.-H. Wang, C.-H. Yang, J.-T. Ko, H.-C. Ho, M.-D. Tsai, D. Bryant, **F.-W. Li**, M.-C. Ho. M.-Y. Ho. A relict phycobilisome structure discovered from a thylakoid-free cyanobacterium. **Nature Communications** 14: 8009.

Kumar, S., Y. Wang, Y. Zhou, L. Dillard, **F.-W. Li**, C. Sciandra, N. Sui, R. Zentella, M. Borgnia, A. Bartesaghi, T.-p. Sun, P. Zhou. 2023. Structure and dynamics of the Arabidopsis O-fucosyltransferase SPINDLY. **Nature Communications** 14: 1538.

De La Cerda, G.Y., J.B. Landis, E. Eifler, A. Hernandez, **F.-W. Li**, J. Zhang, C.M. Tribble, N. Karimi, P. Chan, T. Givnish, S. Strickler, C.D. Specht. 2023. Balancing read length and sequencing depth: optimizing Nanopore sequencing for monocots with an emphasis on Liliales. **Applications in Plant Sciences** 11: e11524.

de Vries, S., C. Herrfurth, **F.-W. Li**, I. Feussner, J. de Vries. 2023. An ancient route towards salicylic acid and its implications for the perpetual *Trichormus–Azolla* symbiosis. **Plant, Cell & Environment** 46: 2884–2908.

Song, M.J., C.J. Rothfels, E. Schuettpelez, J. Nitta, L. Huiet, **F.-W. Li**, K.M. Wefferling. 2023. Resolving deep relationships and revealing ancient whole-genome duplications in Pteridaceae using transcriptomic data. **American Fern Journal** 113: 191–210.

Ang, W.S.L.*, O. Burleigh*, S. Frail*, Y.V.S. Santos*, B. Tyagi*, **F.-W. Li**. 2023. Genome sequence of a symbiotic cyanobacterium from the flowering plant *Gunnera tinctoria*. **Microbiology Resource Announcements** 12: e00563-23.

*Course participants of Molecular and Cell Biology of Symbiosis at Marine Biological Laboratory

Rizzieri, Y.C., A. Lipari*, L.H. Gunn, **F.-W. Li**. 2023. Twelve new bacterial genomes from a non-axenic culture of *Griffithsia monilis* (Rhodophyta). **Microbiology Resource Announcements**, in press.

*Summer REU student

2022

Huang, X.*, W. Wang*, T. Gong*, **D. Wickell***, L.-Y. Kuo, X. Zhang, J. Wen, H. Kim, F. Lu, H. Zhao, S. Chen, H. Li, W. Wu, C. Yu, S. Chen, W. Fan, S. Chen, X. Bao, L. Li, D. Zhang, L. Jiang, X. Yan, Z. Liao, G. Zhou, Y. Guo, J. Ralph, R.R. Sederoff, H. Wei#, P. Zhu#, **F.-W. Li#**, R. Ming#, Q. Li#. 2022. The flying spider-monkey tree fern genome provides insights into fern evolution and arborescence. **Nature Plants** 8: 500–512.

Cover

*Equally contributed; #Corresponding authors

Featured in: [New York Times](#), [Scientific American](#), [Science](#)

Marchant, D.B., G. Chen, S. Cai, F. Chen, **P. Schafran**, J. Jenkins, S. Shu, C. Plott, J. Webber, J. Lovell, G. He, L. Sandor, M. Williams, S. Rajasekar, A. Healey, K. Barry, Y. Zhang, E. Sessa, R. Dhakal, P. Wolf, A. Harkess, **F.-W. Li**, C. Rössner, A. Becker, L. Gramzow, D. Xue, Y. Wu, T. Tong, Y. Wang, F. Dai, S. Hua, H. Wang, S. Xu, F. Xu, H. Duan, G. Theißen, R.J. Schmitz, D. Stevenson, C. Zumajo-Cardona, B.A. Ambrose, J.H. Leebens-Mack, J. Grimwood, J. Schmutz, P.S. Soltis, D.E. Soltis, Z.H. Chen. 2022. Dynamic genome evolution in a model fern. **Nature Plants** 8: 1038–1051.

Robison, T.A., J.M. Nelson, D.A. Hauser, L.A. Lewis, **F.-W. Li**. 2022. Dynamic plastid and mitochondrial genomes in Chaetopeltidales (Chlorophyceae) and characterization of a new chlorophyte taxon. **American Journal of Botany** 6: 939–951.

Featured in: [The Hill](#), [Slate](#), [Blavity](#), [Cornell Chronicle](#)

Petlewski, A.R., D.A. Hauser, M. Kim, J. Schmutz, J. Grimwood, **F.-W. Li**. 2022. Re-evaluating the systematics of *Dendrolycopodium* using restriction-site associated DNA-sequencing. **Frontiers in Plant Science** 13: 912080.

Ke, B.-F., G.-J. Wang, P.H. Labiak, G. Rouhan, Goflag Consortium, C.-W. Chen, L. Shepherd, D.J. Ohlsen, M.A.M. Renner, K.G. Karol, **F.-W. Li**, **L.-Y. Kuo**. 2022. Systematics and plastome evolution in Schizaeaceae. **Frontiers in Plant Science** 13: 885501.

Gunadi, A., F.-W. Li, J. Van Eck. 2022. Accelerating the gametophyte growth of the model hornwort *Anthoceros agrestis* (Anthocerotaceae). **Applications in Plant Sciences** 10: e11460.

Neubauer, A., S. Ruaud, M. Waller, E. Frangedakis, **F.-W. Li**, S.I. Nötzold, S. Wicke, A. Bailly, P. Szövényi. 2022. Step-by-step protocol for isolation and transient transformation of hornwort protoplasts. **Applications in Plant Sciences** 10: e11456.

Petlewski, A.R., A. Patterson*, F.-W. Li. 2022. Characterizing culturable bacterial endophytes of five Lycopodiaceae species. **American Fern Journal** 112: 79–92.

*Summer REU student

Trigoboff, N. and **F.-W. Li.** 2022. *Crepidomanes intricatum* (Hymenophyllaceae), a sporophyte-less filmy fern new to Central New York. **American Fern Journal** 112: 139–141.

Powell, A.F. J. Zhang, **D.A. Hauser**, J. Vilela, A. Hu, D.J. Gates, L.A. Mueller, **F.-W. Li**, S. Strickler, S.D. Smith. 2022. Genome sequence for the blue-flowered Andean shrub *Ichroma cyaneum* reveals extensive discordance across the berry clade of Solanaceae. **The Plant Genome** e20223.

Chatterjee, P., **P. Schafran, F.-W. Li**, J.C. Meeks. *Nostoc* talks back: Differential gene expression during nitrogen starvation of *Anthoceros* and establishment of its symbiosis with *Nostoc*. **Molecular Plant-Microbe Interactions** 35: 917–932.

2021

Wickell, D., L.-Y. Kuo, H.-P. Yang, A.D. Ashok, I. Irisarri, A. Dadras, S. de Vries, J. de Vries, Y.-M. Huang, Z. Li, M.S. Barker, N.T. Hartwick, T.P. Michael, **F.-W. Li.** 2021. Underwater CAM photosynthesis elucidated by *Isoetes* genome. **Nature Communications** 12: 6348.

Featured in: [Cornell Chronicle](#)

Rahmatpour, N., D.A. Hauser, J.M. Nelson, P.Y. Chen, J.C. Villarreal, M.-Y. Ho, **F.-W. Li.** 2021. A novel thylakoid-less isolate fills a billion-year gap in the evolution of Cyanobacteria. **Current Biology** 31: 2857–2867. [Cover](#)

Featured in: [Current Biology Dispatch](#), [Cornell Chronicle](#)

Szövényi, P., **A. Gunadi, F.-W. Li.** 2021. Charting the genomic landscape of seed-free plants. **Nature Plants** 7: 554–565.

Li, F.-W. 2021. Decolonizing botanical genomics. **Nature Plants** 7: 1542–1543.

Yang, H.-P., M. Wenzel, D.A. Hauser, J.M. Nelson, X. Xu, M. Eliáš, **F.-W. Li.** 2021. *Monodopsis* and *Vischeria* genomes shed new light on the biology of eustigmatophyte algae. **Genome Biology and Evolution** 13: evab233.

Nelson, J.M., D.A. Hauser, F.-W. Li. 2021. The diversity and community structure of symbiotic cyanobacteria in hornworts inferred from long-read amplicon sequencing. **American Journal of Botany** 108: 1731–1744.

Featured in: [AJB News and Views](#)

Frangedakis, E., M. Waller, T. Nishiyama, H. Tsukaya, **X. Xu**, Y. Yue, M. Tjahjadi, **A. Gunadi**, J. Van Eck, **F.-W. Li**, P. Szövényi, K. Sakakibara. 2021. An *Agrobacterium*-mediated stable transformation technique for the hornwort model *Anthoceros agrestis*. **New Phytologist** 232: 1488–1505. [Cover](#)

Frangedakis, E., M. Shimamura, J.C. Villarreal, **F.-W. Li**, M. Tomaselli, M. Waller, K. Sakakibara, K.S. Renzaglia, and P. Szövényi. 2021. The hornworts: morphology, evolution and development. **New Phytologist** 229: 735–754. [Cover](#)

2020

Li, F.-W., T. Nishiyama, M. Waller, E. Frangedakis, J. Keller, Z. Li, N. Fernandez-Pozo, M.S. Barker, T. Bennett, M.A. Blázquez, S. Cheng, A.C. Cuming, J. de Vries, S. de Vries, P.-M. Delaux, I.S. Diop, J. Harrison, **D. Hauser**, J. Hernández-García, A. Kirbis, J.C. Meeks, I. Monte, S.K. Mutte, A. Neubauer, D. Quandt, **T. Robison**, M. Shimamura, S.A. Rensing, J.C. Villarreal, D. Weijers, S. Wicke, G.K.-S. Wong, K. Sakakibara, P. Szövényi. 2020. *Anthoceros* genomes illuminate the origin of land plants and the unique biology of hornworts. **Nature Plants** 6: 259–272.

Featured in: [Cornell Chronicle](#)

Radhakrishnan, G.V, J. Keller, M.K. Rich, T. Vernié, D.L. Mbaginda, N. Vigneron, L. Cottret, H.S. Clemente, C. Libourel, J. Cheema, A.-M. Linde, D.M. Eklund, S. Cheng, G.K.-S. Wong, U. Lagercrantz, **F.-W. Li**, G.E.D. Oldroyd, P.-M. Delaux. 2020. An ancestral signalling pathway is conserved in plant lineages forming intracellular symbioses. **Nature Plants** 6: 280–289.

Kuo, L.-Y., Y.-H. Chang, Y.-H. Huang, W. Testa, A. Ebihara, G. Rouhan, L.G. Quintanilla, J.E. Watkins Jr, Y.-M. Huang, **F.-W. Li**. 2020. A global phylogeny of *Stegnogramma* ferns (Thelypteridaceae): generic and sectional revision, historical biogeography and evolution of leaf architecture. **Cladistics** 36: 164–183.

[Cover](#)

Wickell, D.A. and **F.-W. Li**. 2020. On the evolutionary significance of horizontal gene transfers in plants. **New Phytologist** 225: 113–117.

Windham, M.D., K.M. Pryer, D.B. Poindexter, **F.-W. Li**, C.J. Rothfels, and J.B. Beck. 2020. A step-by-step protocol for meiotic chromosome counts in flowering plants: A powerful and economical technique revisited. **Applications in Plant Sciences** 8: e11342.

Bell, D., Q. Lin, W.K. Gerelle, S. Joya, Y. Chang, Z.N. Taylor, C.J. Rothfels, A. Larsson, J.C. Villarreal, **F.-W. Li**, L. Pokorny, P. Szövényi, B. Crandall-Stotler, L. DeGironimo, S.K. Floyd, D.J. Beerling, M.K. Deyholos, M. von Konrat, S. Ellis, A.J. Shaw, T. Chen, G.K.-S. Wong, D.W. Stevenson, J.D. Palmer, S.W. Graham. 2020. Organellomic data sets confirm a cryptic consensus on (unrooted) land-plant relationships, and provide new insights into bryophyte molecular evolution. **American Journal of Botany** 107: 91–115.

Bouchard, R., Peñaloza-Bojacá, G., S. Toupin, Y. Guadalupe, J. Gudiño, N. Salazar Allen, **F.-W. Li**, J.C. Villarreal. 2020. Contrasting bacteriome of the hornwort *Leiosporoceros dussii* in two nearby sites with emphasis on the hornwort-cyanobacterial symbiosis. **Symbiosis** 81: 39–52.

Dawes, T., J.C. Villarreal, P. Szövényi, I. Bisang, **F.-W. Li**, **D.A. Hauser**, D. Quandt, D.C. Cargill, L.L. Forrest. 2020. Extremely low genetic diversity in the European clade of the model bryophyte *Anthoceros agrestis*. **Plant Systematics and Evolution** 306: 49.

Henkhaus, N., M. Bartlett, D. Gang, R. Grumet, I. Jordon-Thaden, A. Lorence, R. Lyons, S. Miller, S. Murray, A. Nelson, C. Specht, B. Tyler, T. Wentworth, D. Ackerly, D. Baltensperger, P. Benfey, J. Birchler, S. Chellamma, R. Crowder, M. Donoghue, J. Pablo Dundore-Arias, J. Fletcher, V. Fraser, K. Gillespie, L. Guralnick, E. Haswell, M. Hunter, S. Kaeppler, S. Kepinski, **F.-W. Li**, S. Mackenzie, L. McDade, Y. Min, J. Nemhauser, B. Pearson, P. Petracek, K. Rogers, A. Sakai, D. Sickler, C. Taylor, L. Wayne, O. Wendroth, F. Zapata, D. Stern. 2020. Plant science decadal vision 2020–2030: Reimagining the potential of plants for a healthy and sustainable future. **Plant Direct** 4: e00252.

2019

One Thousand Plants Initiative. 2019. One thousand plant transcriptomes and the phylogenomics of green plants. **Nature** 574: 679–685.

[Cover](#) (cover image taken by graduate student Alaina Petlewski)

Nelson, J.M., D.A. Hauser, J.A. Gudiño, Y.A. Guadalupe, J.C. Meeks, N. Salazar, J.C. Villarreal, F.-W. Li. 2019. Complete genomes of symbiotic cyanobacteria clarify the evolution of Vanadium-nitrogenase. **Genome Biology and Evolution** 11: 1959–1964.

Petlewski, A.R. and F.-W. Li. 2019. Ferns: the final frond-tier in plant model systems. **American Fern Journal** 109: 192–211.

Kuo, L.-Y. and F.-W. Li. 2019. A roadmap for fern genome sequencing. **American Fern Journal** 109: 212–223.

Eily, A.N., K.M. Pryer, **F.-W. Li.** 2019. A first glimpse at genes important to the *Azolla–Nostoc* symbiosis. **Symbiosis** 78: 149–162.

Kuo, L.-Y., T.-C. Hsu, Y.-S. Chao, W.-T. Liou, H.-M. Chang, C.-W. Chen, Y.-M. Huang, F.-W. Li, Y.-F. Huang, W. Shao, P.-F. Lu, C.-W. Chen, Y.-H. Chang, W.-L. Chiou. 2019. Updating Taiwanese pteridophyte checklist: a new phylogenetic classification. **Taiwania** 64: 367–395.

Li, F.-W. and S. Mathews. 2019. Phylogenetic method to study light signaling. In A. Hiltbrunner (Ed.), *Phytochromes: Methods and Protocols*. Springer Nature (New York).

Wu, C.-C., **F.-W. Li**, E.M. Kramer. 2019. Large-scale phylogenomic analysis suggests three ancient superclades of the WUSCHEL-RELATED HOMEODOMAIN transcription factor family in plants. **PLoS ONE** 14: e0223521.

Yang, E. J., C. Y. Yoo, J. Liu, H. Wang, J. Cao, **F.-W. Li**, K.M. Pryer, T.-P. Sun, D. Weigel, P. Zhu, M. Chen. 2019. NCP activates chloroplast transcription by controlling phytochrome-dependent dual nuclear and plastidial switches. **Nature Communications** 10: 2630.

Delaux, P.-M., A.J. Hetherington, Y. Coudert, C. Delwiche, C. Dunand, S. Gould, P. Kenrick, **F.-W. Li**, H. Philippe, S.A. Rensing, M. Rich, C. Strullu-Derrien, J. de Vries. 2019. Reconstructing trait evolution: A guideline for plant evo-devo studies (and beyond). **Current Biology** 29: R1105–R1121.

2018

Li, F.-W., P. Brouwer, L. Carretero-Paulet, S. Cheng, J. de Vries, P.-M. Delaux, A.N. Eily, N. Koppers, L.-Y. Kuo, Z. Li, M. Simenc, I. Small, E. Wafula, S. Angarita, M.S. Barker, A. Braeutigam, C. dePamphilis, S. Gould, P.S. Hosmani, Y.-M. Huang, B. Huettel, Y. Kato, X. Liu, S. Maere, R. McDowell, L.A. Mueller, K.G.J. Nierop, S.A. Rensing, T. Robison, C.J. Rothfels, E.M. Sigel, Y. Song, P.R. Timilsina, Y. Van de Peer, H. Wang, P. K.I. Wilhelmsson, P.G. Wolf, X. Xu, J.P. Der, H. Schluepmann, G.K.-S. Wong, and K.M. Pryer. 2018. Fern genomes elucidate land plant evolution and cyanobacterial symbioses. **Nature Plants** 4: 460–472. [Cover](#)

Featured in: [Discover Magazine](#), [Mongabay](#), [Cosmos](#), [Earth.com](#), [Quartz](#), [Yale Environmental 360](#), [Cornell Chronicle](#), [Faculty of 1000](#), [Nature Plants News & Views](#)

Li, F.-W., and A. Harkess. 2018. A guide to sequence your favorite plant genomes. **Applications in Plant Sciences** 6: e1030.

Kuo, L.-Y., X Qi, H. Ma, F.-W. Li. 2018. Order-level fern plastome phylogenomics: new insights from Hymenophyllales. **American Journal of Botany** 105: 1545–1555.

Song, M*, L.-Y. Kuo*, L. Huiet, K.M. Pryer, C.J. Rothfels, F.-W. Li. 2018. A novel chloroplast gene reported for flagellate plants. **American Journal of Botany** 105: 117–121.

*Equally contributed

Featured in: [AJB News and Views](#)

Huiet, L., F.-W. Li, T.-T. Kao, J. Prado, A.R. Smith, E. Schuettpelz, K.M. Pryer. 2018. A worldwide phylogeny of *Adiantum* (Pteridaceae) reveals remarkable convergent evolution in leaf blade architecture. **Taxon** 67: 488–502.

Cheng, S., M. Melkonian, S. Smith, S. Brockington, J.M. Archibald, P.-M. Delaux, F.-W. Li, B. Melkonian, E.V. Mavrodiev, W. Sun, Y. Fu, H. Yang, D.E. Soltis, S.W. Graham, P.S. Soltis, X. Liu, X. Xu, G.K.-S. Wong. 2018. 10KP: A phylodiverse genome sequencing plan. **GigaScience** 7: giy013.

Kuo L.-Y., T.-Y. Tang, F.-W. Li, H.-J. Su, W.-L. Chiou, Y.-M. Huang, C.-N. Wang. 2018. Organelle genome inheritance in *Deparia* ferns (Athyriaceae, Aspleniineae, Polypodiales). **Frontiers in Plant Science** 9: 486.

Dijkhuizen, L., P. Brouwer, H. Bolhuis, G.-J. Reichart, N. Koppers, B. Huettel, A. Bolger, F.-W. Li, S. Cheng, X. Liu, G.K.-S. Wong, K.M. Pryer, A. Weber, A. Bräutigam, H. Schluempmann. 2018. Is there foul play in the leaf pocket? The metagenome of floating fern *Azolla* reveals endophytes that do not fix N₂ but may denitrify. **New Phytologist** 217: 453–466.

Villarreal, J.C., M. Turmel, M. Bourgouin-Couture, J. Laroche, N. Salazar, F.-W. Li, S. Chen, K. Renzaglia, C. Lemieux. 2018. Genome-wide organellar analyses from the hornwort *Leiosporoceros dussii* show low frequency of RNA editing and its increase during hornwort diversification. **PLoS ONE** 13: e0200491.

Schilling, M.P., Z. Gompert, F.-W. Li, M.D. Windham, P.G. Wolf. 2018. Admixture, evolution, and variation in reproductive isolation in the *Boechera puberula* clade. **BMC Evolutionary Biology** 18: 61.

Lang, D., K. Ullrich, F. Murat, J. Fuchs, J. Jenkins, F. Haas, M. Piednoel, H. Gundlach, M. Van Bel, R. Meyberg, C. Vives, J. Morata, A. Symeonidi, M. Hiss, W. Muchero, Y. Kamisugi, O. Saleh, G. Blanc, E. Decker, N. van Gessel, J. Grimwood, R. Hayes, S. Graham, L. Gunter, S. McDaniel, S. Hoernstein, A. Larsson, F.-W. Li, P.-F. Perroud, J. Philipps, P. Ranjan, D. Rokhsar, C.J. Rothfels, L. Schneider, S. Shu, D. Stevenson, F. Thümmel, M. Tillich, J.C. Villarreal, T. Widiez, G.K.-S. Wong, A. Wymore, Y. Zhang, A. Zimmer, R. Quatrano, K. Mayer, D. Goodstein, J. Casacuberta, K. Vandepoele, R. Reski, A. Cuming, G. Tuskan, F. Maumus, J. Salse, J. Schmutz, S. Rensing. 2018. The *Physcomitrella patens* chromosome-scale assembly reveals moss genome structure and evolution. **Plant Journal** 93: 515–533.

2017

Li, F.-W., J.C. Villarreal, P. Szovenyi. 2017. Hornworts, an overlooked window into carbon-concentrating mechanism. **Trends in Plant Science** 22: 275–277.

Li, F.-W., C.A. Rushworth, J.B. Beck, M.D. Windham. 2017. *Boechera* Microsatellite Website: an online portal for species identification and hybrid relationship resolution. **Database** 1: baw169.

Rothfels, C.J., K.M. Pryer, F.-W. Li. 2017. Next-generation polyploid phylogenetics: Rapid resolution of hybrid polyploid complexes using PacBio single-molecule sequencing. **New Phytologist** 213: 413–429.

Rockwell, N.C., S.S. Martin, F.-W. Li, S. Mathews, J.C. Lagarias. 2017. The phycocyanobilin chromophore of streptophyte algal phytochromes is synthesized by HY2. **New Phytologist** 214: 1145–1157.

2016

Li, F.-W., L.-Y. Kuo, K.M. Pryer, C.J. Rothfels. 2016. Genes translocated into the plastid inverted repeat show a marked deceleration in substitution rates and an elevated GC content. **Genome Biology and Evolution** 8: 2452–2458. [Cover](#)

Li, F.-W., L.Y. Kuo, Y.H. Chang, T.C. Hsu, H.C. Hung, W.L. Chiou, C.J. Rothfels, Y.M. Huang. 2016. *Asplenium pifongiae* (Aspleniaceae: Polypodiales), a new species from Taiwan. **Systematic Botany** 41: 24–31.

Hsu, P.Y., L. Calviello, H.-Y. L. Wu*, F.-W. Li*, C.J. Rothfels, U. Ohler, P.N. Benfey. 2016. Super-resolution ribosome profiling reveals unannotated translation events in *Arabidopsis*. **Proceedings of the National Academy of Sciences USA** 113: E7126–E7135.

*Equally contributed

Jia, Q., G. Li, T.G. Köllner, J. Fu, X. Chen, W. Xiong, B.J. Crandall-Stotler, J.L. Bowman, D.J. Weston, Y. Zhang, L. Chen, Y. Xie, F.-W. Li, C.J. Rothfels, A. Larsson, S.W. Graham, D.W. Stevenson, G.K.-S. Wong, J. Gershenzon, F. Chen. 2016. Microbial-type terpene synthase genes occur widely in nonseed land plants, but not in seed plants. **Proceedings of the National Academy of Sciences USA** 113: 12328–12333.

Stevenson, S.R., Y. Kamisugi, J. Schmutz, J.W. Jenkins, J. Grimwood, W. Muchero, G.A. Tuskan, S.A. Rensing, D. Lang, R. Reski, C. Trinh, M. Melkonian, C.J. Rothfels, F.-W. Li, A. Larsson, G.K.S. Wong, T. Edwards, A.C. Cuming. 2016. Genetic analysis of *Physcomitrella patens* identifies ABSCISIC ACID NON-RESPONSIVE (ANR): a regulator of ABA responses unique to basal land plants, required for desiccation tolerance. **Plant Cell** 28 1310–1327.

Pryer, K.M., L. Huiet, F.-W. Li, C.J. Rothfels, E. Schuettpelz. 2016. Maidenhair ferns, *Adiantum*, are indeed monophyletic, and sister to the shoestring ferns, vittaroids (Pteridaceae). **Systematic Botany** 41: 14–23.

The Pteridophyte Phylogeny Group. 2016. A community-derived classification for extant lycophytes and ferns. **Journal of Systematics and Evolution** 54: 563–603.

2015

Li, F.-W., M. Melkonian, C.J. Rothfels, J.C. Villareal, D. Stevenson, S.W. Graham, G.K.-S. Wong, K.M. Pryer, S. Mathews. 2015. Phytochrome diversity in green plants and the origin of canonical plant phytochromes. **Nature Communications** 6: 7852.

Li, F.-W., C.J. Rothfels, M. Melkonian, J.C. Villarreal, D.W. Stevenson, S.W. Graham, G.K.-S. Wong, S. Mathews, and K.M. Pryer. 2015. The origin and evolution of phototropins in plants. **Frontiers in Plant Science** 6: 637.

Li, F.-W., S. Mathews. 2015. Evolutionary aspects of plant photoreceptors. **Journal of Plant Research** 129: 115–122.

Rothfels C.J., F.-W. Li, E.M. Sigel., L. Huiet, A. Larsson, D.O. Burge, M. Ruhsam, M. Deyholos, D. Soltis, N. Stewart, S. Shaw, L.M. Pokorny, T. Chen, C. dePamphilis, L. DeGironimo, D.W. Stevenson, S.W. Graham, G.K.-S. Wong, and K.M. Pryer. 2015. The evolutionary history of ferns inferred from 25 single-copy nuclear genes. **American Journal of Botany** 102: 1089–1107.

Windham, M.D., J.B. Beck, F.-W. Li, A. Allphin, J.G. Carman, C.A. Rushworth, E.M. Sigel, P.J. Alexander, C.D. Bailey, I.A. Al-Shehbaz. 2015. Searching for diamonds in the apomictic rough: A case study involving *Boecheera lignifera* (Brassicaceae). **Systematic Botany** 40: 1031–1044.

Wolf, P.G., E.B. Sessa, D.B. Marchant, **F.-W. Li**, C.J. Rothfels, E.M. Sigel, M.A. Gitzendanner, C.J. Visger, J.A. Banks, D.E. Soltis, P.S. Soltis, K.M. Pryer, and J.P. Der. 2015. An exploration into fern genome space. **Genome Biology and Evolution** 7: 2533–2544.

2009-2014

Li, F.-W., J.C. Villarreal, S. Kelly, C.J. Rothfels, M. Melkonian, E. Frangedakis, M. Ruhsam, E. M. Sigel, J.P. Der, J. Pittermann, D.O. Burge, L. Pokorny, A. Larsson, T. Chen, S. Weststrand, P. Thomas, E. Carpenter, Y. Zhang, Z. Tian, L. Chen, Z. Yan, Y. Zhu, X. Sun, J. Wang, D.W. Stevenson, B.J. Crandall-Stotler, A.J. Shaw, M.K. Deyholos, D.E. Soltis, S.W. Graham, M.D. Windham, J.A. Langdale, G.K.S. Wong, S. Mathews & K.M. Pryer. 2014. Horizontal transfer of an adaptive chimeric photoreceptor from bryophytes to ferns. **Proceedings of the National Academy of Sciences USA** 111: 6672–6677.

Featured in: [New York Times](#), [The Economist](#), [National Geographic](#), [Scientific American](#), [Faculty of 1000](#), [Current Biology](#), [Nature Reviews Genetics](#)

Li, F.-W., K.M. Pryer. 2014. Crowdfunding the *Azolla* fern genome project: a grassroots approach. **GigaScience** 3: 16.

Featured in: GigaScience Editor's pick

Sessa, E.B., J.A. Banks, M.S. Barker, J.P. Der, A.M. Duffy, S.W. Graham, M. Hasebe, J. Langdale, **F.-W. Li**, D.B. Marchant, K.M. Pryer, C.J. Rothfels, S.J. Roux, M.L. Salmi, E.M. Sigel, D.E. Soltis, P.S. Soltis, D.W. Stevenson, P.G. Wolf. 2014. Between two fern genomes. **GigaScience** 3:15.

Zhang, W.Y., L.Y. Kuo, **F.-W. Li**, C.N. Wang, W.L. Chiou. 2014. The hybrid origin of *Adiantum meishanianum* (Pteridaceae): a rare and endemic species in Taiwan. **Systematic Botany** 39: 1034–1041.

Rothfels, C.J., A. Larsson, **F.-W. Li**, E.M. Sigel, L. Huiet, D.O. Burge, M. Ruhsam, S. Graham, D. Stevenson, G.K.S. Wong, P. Korall, K.M. Pryer. 2013. Transcriptome-mining for fern single-copy nuclear regions. **PLoS One** 8: e76957.

Li, F.-W., K.M. Pryer, M.D. Windham. 2012. *Gaga*, a new genus segregated from *Cheilanthes* (Pteridaceae). **Systematic Botany** 37: 845–860.

Featured in: [New York Times](#), [Rolling Stone](#), [Huffington Post](#), [Wired](#), [The Guardian](#)

Li, F.-W., L.Y. Kuo, C.J. Rothfels, A. Ebihara, W.L. Chiou, M.D. Windham, K.M. Pryer. 2011. *rbcL* and *matK* earn two thumbs up as the core DNA barcode for ferns. **PLoS One** 6: e26597.

Li, F.-W. 2011. Book review: Knapp, Ralf. 2011. Ferns and Fern Allies of Taiwan. **Taxon** 60: 1233–1234.

Kuo*, L.Y., **F.-W. Li***, W.L. Chiou, C.N. Wang. 2011. The first insight into fern *matK* phylogeny. **Molecular Phylogenetics and Evolution** 59: 556–566.

*Equally contributed

Li*, F.-W., L.Y. Kuo*, Y.M. Huang, W.L. Chiou, C.N. Wang. 2010. Tissue-Direct PCR, a rapid and extraction-free method for barcoding of ferns. **Molecular Ecology Resources** 10: 92–95.

*Equally contributed

Li, F.-W., B.C. Tan, V. Buchbender, R.C. Moran, G. Rouhan, C.N. Wang, D. Quandt. 2009. Identifying a mysterious aquatic fern gametophyte. **Plant Systematics and Evolution** 281: 77–86.

Popular Science Publication

FERNS - Lessons in Survival from Earth's Most Adaptable Plants | Fay-Wei Li & Jacob S Suissa, Illustrated by Laura Silburn. Hardie Grant Publishing. Coming in 2025.

FELLOWSHIPS AND AWARDS

- 2023 Humboldt Research Fellowship, Alexander von Humboldt Foundation
- 2016 Forschungskredit postdoc fellowship, University of Zurich
- 2015 Perry Price (best thesis in plant science), Duke University
- 2014 Edgar T. Wherry Award, Botanical Society of America
- 2014 NSF Doctoral Dissertation Improvement Grant
- 2012 NSF Graduate Research Fellowship

FUNDING

LEAD PI ON 5 FEDERAL GRANTS TOTALING \$4,758,694 (\$2,908,166 TO BTI)

Pending

USDA Foundational Knowledge of Plant Products | **Characterizing the cannabinoid biosynthesis pathway in the liverwort *Radula obconica***

\$645,155

PI: Fay-Wei Li

Current

NSF DEB PURSUIT | **Uncovering the hidden diversity of Gloeobacteria, an enigmatic lineage crucial for understanding the early evolution of cyanobacteria** (2426285)

\$1,063,529 (2024.8.1 – 2027.7.31), Li portion: \$595,531

PI: Fay-Wei Li, Christy Grettenberger (University of California Davis)

NSF MCB Cellular Dynamics and Function | **From phylogeny to biomolecules: a cross-scale approach to understand the making of a unique carbon-concentrating mechanism in hornworts** (2213841)

\$1,072,924 (2022.6.1 – 2025.5.31), Li portion: \$503,654

PI: Fay-Wei Li, Laura Gunn (Cornell Plant Biology)

Completed

NSF IOS EDGE | **Developing transformation capacity for *Anthoceros agrestis* to facilitate gene function studies in hornworts, a remarkable phylum of plants** (1923011)

\$548,419 (2019.9.1 – 2024.8.31)

PI: Fay-Wei Li, Co-PI: Joyce Van Eck (BTI)

NSF DEB Dimensions of Biodiversity | **Integrating phylogenetics, ecophysiology, and transcriptomics to understand the diversity of hornwort-cyanobacterium symbiosis** (1831428)

\$1,830,855 (2019.1.1 – 2024.12.31), Li portion: \$1,191,078

PI: Fay-Wei Li, John Meeks (University of California Davis), Jed Sparks (Cornell EEB)

Supplement #1 | Research Experience for Post-Baccalaureate Students (2139576)

\$40,750

Supplement #2 | Research Collaboration Opportunity in Europe (2034018)

\$27,005

DOE Large-Scale EMSL Research User Grant | **Understanding the genetic and structural bases of hornworts' carbon-concentrating mechanism**

\$118,888 in-kind support (2021.10.1 – 2023.9.30)

PI: Fay-Wei Li

Internal seed grants

Triad Foundation Award | **Understanding how ferns can withstand extreme desiccation**

\$100,000 (2021.9.1 – 2022.8.31)

PI: Fay-Wei Li, Sally Chambers (Marie Selby Botanical Gardens)

Triad Foundation Award | **An “EPYC” quest to search for the Rubisco tether protein in hornwort pyrenoids**

\$59,125 (2021.7.1 – 2022.6.30)

PI: Fay-Wei Li, Joyce Van Eck and Aleksandra Skirycz

Triad Foundation Award | **Biosynthesis of cannabinoids in liverworts**

\$75,000 (2020.9.1 – 2021.8.31)

PI: Fay-Wei Li, Georg Jander, Frank Schroeder

Industry grants

Corteva Agriscience | **Screening of insecticidal proteins from seed-free plants**

\$ cannot be disclosed

PI: Fay-Wei Li

INVITED SEMINARS AND SIGNIFICANT MEETING PRESENTATIONS

- 2025 **Harvard University**, Department of Organismic and Evolutionary Biology (scheduled)
- 2025 **Michigan State University**, Biochemistry & Molecular Biology (scheduled)
- 2024 **Gregor Mendel Institute of Molecular Plant Biology**, Vienna, Austria (scheduled)
- 2024 **CNRS Laboratoire de Recherche en Sciences Végétales**, Toulouse, France
- 2024 **University of Münster**, Institute of Plant Biology and Biotechnology
- 2024 **University of Goöttingen**, Albrecht-von-Haller-Institute for Plant Sciences, Germany
- 2024 **University of Connecticut**, Department of Ecology and Evolutionary Biology
- 2024 **Corteva Agriscience**
- 2024 **University of Edinburgh**, Institute of Molecular Plant Sciences
- 2023 **Friedrich Schiller University Jena**, Institute of Ecology and Evolution
- 2023 **Botany 2023**, Colloquium *Attack of the (haploid) clones: the resurgence of gametophyte biology across land plants*
- 2023 **Gordon Research Conference**, “Chloroplast Biotechnology”, Ventura Beach, CA
- 2023 **University of Arizona**, Department of Ecology & Evolutionary Biology
- 2022 **EMBO Workshop**, “An integrated view of early land plant evolution”, Bhubaneswar, India
- 2022 **Plant Genome Online**, keynote speaker
- 2021 **Louisiana State University**, Department of Biological Sciences
- 2021 **University of Maryland**, UMD Plant Virtual Minisymposium
- 2021 **University of California Davis**, Photosynthesis Mini-Symposium
- 2021 **Laboratoire Reproduction et Développement des Plantes**, Lyon
- 2021 **University of Goöttingen**, Institute for Microbiology and Genetics
- 2020 **Oxford University**, Oxford University Biological Society
- 2020 **Botany 2020**, Colloquium *Mechanisms of rapid adaptation through the expression of “heterogenomicity”*
- 2020 **Ithaca College**, Department of Biology
- 2019 **Smithsonian National Museum of Natural History (Botany)**, Washington DC

- 2019 **Smithsonian National Museum of Natural History** (“Phylopizza”), Washington DC
 2019 **Marine Biological Laboratory**, Woods Hole, MA
 2018 **Harvard University**, Herbarium Seminar Series
 2018 **EMBO Workshop**, “New shores in land plant evolution”, Lisbon, Portugal
 2018 **National Tsing Hua University** (Taiwan), Institute of Molecular and Cell Biology
 2018 **7th Asian Symposium of Ferns and Lycophyte**, Keynote speaker, Taipei, Taiwan
 2017 **University of Rochester**, Department of Biology
 2017 **Arizona State University**, The Life Science Cafe seminar series
 2017 **Iowa State University**, Department of Ecology, Evolution, and Organismal Biology
 2017 **Chicago Plant Science Symposium**
 2017 **Cornell University**, Plant Biology Section
 2016 **Utrecht University**, Institute of Environmental Biology
 2016 **University of Zurich**, Department of Systematic and Evolutionary Botany
 2016 **Université Laval**, Institute for Integrative Systems Biology
 2016 **Yale University**, Department of Ecology and Evolutionary Biology
 2015 **North Carolina State University**, Plant & Microbial Biology Seminar

TEACHING

Main Instructor

- Molecular and Cell Biology of Symbiosis**,
 Marine Biological Laboratory 2023
For graduate students and postdocs. I gave lectures and led lab projects symbiosis in plants.
- Concepts and Techniques in Plant Biology** (PLBIO 6831),
 Cornell University 2023
Graduate-level course.
- Problems in Plant Biology** (PLBIO 7410), Cornell University 2022 – 2023
Graduate-level seminar course.
- Plant Comparative and Evolutionary Genomics** (PLBIO 7420),
 Cornell University 2018
Graduate-level course.
- Practical Phylogenetics**, Duke University 2014
Graduate-level course, co-taught with Dave Swofford.

Guest Lectures

- CSI: Forensic Botany** (PLSCI 11500), Cornell University 2023
One lecture on the use of bryophytes in forensics
- Introductory Plant Diversity and Evolution** (PLBIO 2410), Cornell University
One lecture on bryophyte diversity 2022 – 2023
- Vascular Plant Systematics** (PLBIO 2480), Cornell University 2020 – 2022
Two lectures on the biology of algae, bryophytes, lycophytes, and ferns
- Problems in Plant Biology** (PLBIO 7410), Cornell University 2017 – 2021
One lecture around a paper of interest

Medical Ethnobotany (PLBIO 1100), Cornell University <i>One lecture on the medicinal use of ferns</i>	2017 – 2020
Topics in Plant Evolution (PLBIO 6560), Cornell University <i>Weekly paper discussion</i>	2017 – 2020
Faculty Research (PLBIO 7430), Cornell University <i>One lecture about my research program to the first-year graduate students</i>	2017 – 2019
Principles of Biology (BIO 110), SUNY Cortland <i>One lecture about seed-free plants</i>	2022

MENTORING

Graduate Students Advised

Yanã Rizzieri	Cornell Plant Biology	2023-present
Tanner Robison	Cornell Plant Biology	2019-present
David Wickell	Cornell Plant Biology	2018-2023
Alaina Petlewski	Cornell Plant Biology	2017-2021

Postdoctoral Researchers Advised

Warren Ang	2022-present
Sylvia Kinosian	2022-present (co-advised with Michael Barker, University of Arizona)
Peter Schafran	2019-present
Declan Lafferty	2022-present (co-advised with Joyce Van Eck, BTI); now Research Support Officer at University of Melbourne
Guillermo J. Aleman	2022-present (co-advised with Georg Jander, BTI); now Assistant Professor at New Jersey Institute of Technology
Jacob Suissa	2022-2023 (co-advised with Corrie Moreau, Cornell EEB); now Assistant Professor at University of Tennessee Knoxville
Andika Gunadi	2019-2021 (co-advised with Joyce Van Eck, BTI); now Plant Transformation and Genome-editing Scientist, J.R. Simplot Company
Nasim Nahmatpour	2019-2021; now Bioinformatics Scientist, Analytical Biosciences
Jessica Nelson	2017-2019; now Lecturer of Biology, Maastricht University (Netherlands)
Li-Yaung Kuo	2017-2019; now Assistant Professor, National Tsing Hua University (Taiwan)

Awards Received by Students

Yanã Rizzieri	Phycological Society of America Grants-in-Aid (\$1,500)
David Wickell	Smithsonian Graduate Student Fellowship, National Museum of Natural History (\$8,000)
David Wickell	Washington Biologists Field Club Research Awards (\$4,035)
David Wickell	Schmittau-Novak Integrative Plant Science Small Grants, Cornell (\$3,992)
Tanner Robison	Schmittau-Novak Integrative Plant Science Small Grants, Cornell (\$4,207)
Alaina Petlewski	R.C. Lewontin Early Award, Society for the Study of Evolution (\$2,500)
Alaina Petlewski	Andrew W. Mellon Student Research Grant, Cornell (\$780)
Alaina Petlewski	American Society of Plant Taxonomists Graduate Student Research Grant (\$1,200)

Awards Received by Postdocs

Jacob Suissa	NSF Postdoctoral Research Fellowship (Rules of Life track)
Sylvia Kinosian	NSF Postdoctoral Research Fellowship (Plant Genome track)
Peter Schafran	NSF Postdoctoral Research Fellowship (Plant Genome track)

Dissertation/Exam Committee

Ryan Thummel	Cornell Plant Biology	Advisor: Alejandra Gandolfo
Ayress Grinage	Cornell Plant Biology	Advisor: Chelsea Specht
Joseph Cammarata	Cornell Plant Biology	Advisor: Michael Scanlon & Adrienne Roeder
Heather Phillips	Cornell Plant Biology	Advisor: Chelsea Specht
Thereis Choo	Cornell Plant Biology	Advisor: Kevin Nixon
Michael Song	UC Berkeley IB	Advisor: Carl Rothfels
Nikolai Hay	Duke Biology	Advisor: Kathleen Pryer
Blake Fauskee	Duke Biology	Advisor: Kathleen Pryer
Ariana Eily	Duke Biology	Advisor: Kathleen Pryer
Rizky Kafrawi	Hobart and William Smith Colleges	Advisor: Shannon Straub

Undergraduate/High School Students Advised

Alexander Fenlon	Arizona State University	2024
Isabel Smalley	University of Minnesota	2023
Evan Smith	University of Notre Dame	2023
Jenna Sins	Gannon University	2022
August Lipari	Grinnell College	2022
Makaila Weir	Ohio Wesleyan University	2021
Isa Johnson	Ohio Wesleyan University	2021
Ariel Patterson	Reeds College	2019 (Best poster; BTI REU symposium)
Victor Cai	Duke University	2019
Marazzano Colon	Duke University	2018
Harry Hou	Kimball Union Academy	2018

Other Contributions and Interactions

Graduate student admission committee, Plant Biology Field, Cornell University (2024)
 Graduate student recruitment committee, Plant Biology Field, Cornell University (2023)
 Graduate student recruitment committee, Plant Biology Field, Cornell University (2019)
 Graduate student admission committee, Plant Biology Field, Cornell University (2018)

PROFESSIONAL ACTIVITIES*Public Outreach*

- 2023 **Let's Botanize**, "Hornworts!"
Collaboration with Let's Botanize (>129K followers on Instagram) to introduce hornworts. Recording.
- 2021 **Art at BTI**, "Dead Plant Wisdom: Exploring identity, colonialism and climate change through art and herbaria"
Conversation with Zachari Logan and AJ Bouchie. Recording.
- 2020 **Fundraising campaign for Cayuga Lake harmful algal bloom research**
Working closely with Aly Evans to put together a fundraising proposal. We held four info sessions to engage with the local communities and pitch the project idea.

- 2020 **BTI Breaking Ground Discussion Series, “Spooky Plants”**
Recording.
- 2019 **Finger Lakes Native Plant Society, “Ferntastic Ferns and Lycophytes”**
Talked about the natural history of ferns and lycophytes.
- 2019 **Science on Screen: Little shop of horrors**
Gave a pre-show presentation “Killer Plants!” in Cinemapolis as a part of the Science on Screen program. Recording.
- 2018 **Sciencenter After Dark: Wicked Plants**
Engage with the public with hands-on activities
- 2018 **Sciencenter Members’ Night, “Wicked ferns—Ferns that killed the early Australian explorers”**
The opening talk for the Wicked Plants exhibition. 75% of the audience were children.
- 2018 **Judy’s Day** at Cornell Botanic Gardens
My lab has two booths: “Ferntastic Azolla and Lycophytes” and “Amazing Bryophytes”. Jessica Nelson (postdoc) did several botanical drawings for the stickers, and I helped make sure the tree of life figure (this year’s theme) is correct
- 2018 **Workshop on Pteridophyte Reproductive Biology** at Dr. Cecilia Koo Botanic Conservation Center (Taiwan)
A training workshop for researchers in Southeast Asia. I gave a lecture on “High-level classification of ferns and lycophytes”
- 2018 **NSF INCLUDE** at Cornell University, “Biodiversity!”
To high school students from underserved school districts
- 2017 **Ithaca Garden Club, “Ferntastic ferns and where to find them”**
To members of the garden club
- 2017 **NSF INCLUDE** at Cornell University, “Biodiversity!”
To high school students from underserved school districts
- 2017 **Art at BTI, “Tamed Wonders: Ferns and humans as seen from the BTI atrium”**
To artists and art-lovers; video recording
- 2017 **BTI Giving Tuesday Livestream**
Live video interview with Keith Hannon
- 2017 **Fascination of Plants Day Livestream**
Live video interview with Keith Hannon
- 2017 **BTI Science Bomb Podcast**
Audio interview with Keith Hannon

Media Appearance

- 2023 Quoted by Science “Fern proteins fight crop pests, could usher in potent new insecticides”
- 2022 Interviewed and featured by New Scientist “Horizontal gene transfer happens more often than anyone thought”
- 2022 Quoted by New Scientist “Genes from bacteria may have helped plants colonise the land”
- 2022 Quoted by Nature Plants Research Briefing “The evolutionary mechanisms of mycoheterotrophic orchids”
- 2019 Quoted by The Mercury News “Genetic code for California’s iconic trees uncovered”

Editorial Service

- 2018 – 2023 **Associate Editor**, Molecular Phylogenetics and Evolution (handled 74 manuscripts)

2021 – 2023 **Associate Editor**, American Fern Journal (handled 2 manuscript)

Symposium/workshop Organizer

- 2022 **Botany 2022 workshop: *de novo* genome Assembly and Annotation with an Emphasis on Phylogenetic and Population Genetic Studies**, co-organized with Suzy Strickler and Jacob Landis
- 2021 **Hornworts: the Next Generation**, Bryophytes and Lichens BL2021 (virtual)
- 2021 **Botany 2021 workshop: *de novo* genome Assembly and Annotation with an Emphasis on Phylogenetic and Population Genetic Studies**, co-organized with Suzy Strickler and Jacob Landis (virtual)
- 2020 **Botany 2020 workshop: *de novo* genome Assembly and Annotation with an Emphasis on Phylogenetic and Population Genetic Studies**, co-organized with Suzy Strickler and Jacob Landis (virtual)
- 2017 **Plant genome evolution from the very beginning**, co-organized with Charles Delwiche (University of Maryland), XIX International Botanical Congress, Shenzhen, China

Grant Proposal Reviewer

- 2024 Swiss National Science Foundation
- 2023 National Science Foundation
- 2023 European Research Council
- 2023 Dutch Research Council
- 2020 The Royal Society University Research Fellowship (UK)
- 2020 Czech Science Foundation
- 2020 Academia Sinica Thematic Research Program (Taiwan)
- 2020 American Society of Plant Taxonomists Graduate Student Research Grants
- 2020 Society for the Study of Evolution Rosemary Grant Awards
- 2018 Czech Science Foundation
- 2018 Society of Systematic Biologists Graduate Student Research Awards

Journal Reviewer

Nature Plants (x11), Nature Communications (x5), Nature Ecology and Evolution, Nature Genetics, Science Advances, PNAS (x6), Current Biology (x2), New Phytologist (x9), Molecular Plant, Plant Cell, Plant Communications, Plant Journal (x2), Molecular Biology and Evolution (x2), Genome Biology, ISME J, Genome Biology and Evolution (x2), American Journal of Botany (x3), American Fern Journal (x2), Annals of Botany (x2), Applications in Plant Sciences (x2), BMC Evolutionary Biology, BMC Plant Biology, BMC Research Notes, Current Genetics, Frontiers in Plant Science (x2), GigaScience (x2), Heredity, Horticulture Research, Journal of Molecular Evolution, Journal of Systematics and Evolution, Molecular Ecology Resources, Molecular Phylogenetics and Evolution (x4), PeerJ, Phytotaxa (x2), Plant and Cell Physiology, Plant Systematics and Evolution (x3), Plants People Planet, Review of Palaeobotany and Palynology, Scientific Reports (x3), Symbiosis, Systematic Botany, Taxon