

Curriculum Vitae

Joseph H. Lynch

Division of Plant and Soil Science
Davis College of Agriculture, Natural Resources and Design
West Virginia University | Morgantown, WV

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EDUCATION

PhD, Molecular Plant Sciences (via the Institute of Biological Chemistry) July 2013
Washington State University, Pullman, WA
Dissertation: Characterization of Enzymes Involved in Flavin Cofactor Metabolism

BS, Biology (Minor: Chemistry) May 2008
Gonzaga University, Spokane, WA

ACADEMIC APPOINTMENTS

Assistant Professor 2021-Present
Division of Plant and Soil Science

Associate Research Scientist 2018-2021
Department of Biochemistry, Purdue University

Postdoctoral Research Associate 2013-2017
Department of Biochemistry, Purdue University
Advisor: N. Dudareva

Postdoctoral Research Associate 2013
Institute of Biological Chemistry, Washington State University
Advisor: S. Roje

Graduate Research Assistant 2008-2013
Institute of Biological Chemistry, Washington State University
Advisor: S. Roje

Undergraduate Research Assistant 2006-2008
Department of Biology, Gonzaga University
Advisor: W. Ettinger

FUNDING

USDA-NIFA Foundational and Applied Science Program (\$500,000)
Principle Investigator: N Dudareva*, Senior Personnel: JH Lynch*
Title: *Deciphering regulatory restrictions on flux towards shikimate pathway-derived high value natural products*
*N Dudareva and JH Lynch both contributed to project design, development, and writing

USDA-NIFA Postdoctoral Fellowship Grant Program (\$129,585)
FUNDED 01/16-12/17

Project Director: JH Lynch, Mentor: N Dudareva

Title: *Elucidation of the Cytosolic Shikimate Pathway in Plants: Characterization of Shikimate Pathway Enzymes and Evaluation of Metabolic Engineering Potential*

PUBLICATIONS

- Lynch, Joseph H.**, Huang, X.Q., and Dudareva, N. (2021) Silent constraints: the hidden challenges faced in plant metabolic engineering. *Current Opinion in Biotechnology*, 69: 112-117.
- Liao, Pan, Ray, S., Boachon, B., **Lynch, J.H.**, Deshpande, A., McAdam, S., Morgan, J.A., and Dudareva, N. (2021) Cuticle thickness affects dynamics of volatile emission from petunia flowers. *Nature Chemical Biology*, 17: 138-145. (Cover)
- Lynch, Joseph H.**, Pichersky, E., and Dudareva, N. (2020) "Floral scent metabolic pathways and their regulation," in *Biology of Plant Volatiles*, ed. E. Pichersky and N. Dudareva (Boca Raton, FL: CRC Press).
- Lynch, Joseph H.***, Qian, Y.*, Guo, L., Maoz, I, Huang, X., Garcia, A., Louie, G., Bowman, M.E., Noel, J.P., Morgan, J.A., and Dudareva, N. (2020) Modulation of auxin formation by the cytosolic phenylalanine biosynthetic pathway. *Nature Chemical Biology*, 16(8): 850-856 (*Equal Contributors)
- Lynch, Joseph H.** and Dudareva, N. (2020) Aromatic amino acid metabolism in plants: An intercompartmental network ripe for exploration. *TRENDS in Plant Science*, 25(7): 670-681.
- Jantzen, Friederike, **Lynch, J.H.**, Kappel, C., Höfflin, J., Skaliter, O., Wozniak, N., Sicard, A., Sas, C., Adebessin, F., Ravid, J., Vainstein, A., Hilker, M., Dudareva, N., and Lenhard, M. (2019) Retracing the molecular basis and evolutionary history of the loss of benzaldehyde emission in the genus *Capsella*. *New Phytologist*, 224(3): 1349-1360.
- Boachon, Benoit, **Lynch, J.H.**, Ray, S., Yuan, J., Caldo, K.M.P., Junker, R.R., Kessler, S.A., Morgan, J.A., and Dudareva, N. (2019) Natural fumigation as a mechanism for volatile transport between flower organs. *Nature Chemical Biology*, 15(6): 583. (Cover)
- Qian, Yichun*, **Lynch, J.H.***, Guo, L., Rhodes, D., Morgan, J.A., and Dudareva, N. (2019) Completion of the cytosolic post-chorismate phenylalanine biosynthetic pathway in plants. *Nature Communications*, 10(1): 15. (*Equal contributors)
- Henry, Laura K., Thomas, S.T., Widhalm, J.R., **Lynch, J.H.**, Davis, T.C., Kessler, S.A., Bohlman, J., Noel, J.P., and Dudareva, N. (2018) Contribution of Isopentenyl Phosphate to Plant Terpenoid Metabolism. *Nature Plants*, 4(9): 721. (Featured Hero)
- Lynch, Joseph H.**, Sa, N., Raffaelli, N., and Roje, S. (2018) A Non-Nudix FAD Pyrophosphatase Modulates Flavin Homeostasis in *Saccharomyces cerevisiae*. *PLOS One*, 13(6): e0198787.

Curriculum Vitae

Adebesin, Funmi, Widhalm, J.R., **Lynch, J.H.**, McCoy, R., and Dudareva, N. (2018) A Peroxisomal Thioesterase Plays Auxiliary Roles in Plant β -Oxidative Benzoic Acid Metabolism. *The Plant Journal*, 93(5): 905-916.

Lynch, Joseph H., Orlova, I., Zhao, C., Guo, L., Jaini, R., Maeda, H., Akhtar, T., Cruz-Lebron, J., Rhodes, D., Morgan, J., Pilot, G., Pichersky, E., and Dudareva, N. (2017). Multifaceted Plant Responses to Circumvent Phe Hyperaccumulation by Downregulation of Flux through the Shikimate Pathway and by Vacuolar Phe Sequestration. *The Plant Journal*. 92 (5): 939-950.

Adebesin, Funmi, Widhalm, J. R., Boachon, B., Lefèvre, F., Pierman, B., **Lynch, J.H.**, Alam, I., Junqueira, B., Benke, R., Ray, S., Porter, J.A., Yanagisawa, M., Wetzstein, H.Y., Morgan, J.A., Boutry, M., Schuurink, R.C., and Dudareva, N. (2017). Emission of volatile organic compounds from petunia flowers is facilitated by an ABC transporter. *Science*, 356(6345), 1386-1388. (Cover)

Widhalm, Joshua R., Gutensohn, M., Yoo, H., Adebesin, F., Qian, Y., Guo, L., Jaini, R., **Lynch, J.H.**, McCoy, R.M., Shreve, J.T., Thimmapuram, J., Rhodes, D., Morgan, J.A., and Dudareva, N. (2015) Identification of a plastidial phenylalanine exporter that influences flux distribution through the phenylalanine biosynthetic network. *Nature Communications*, 6:8142.

Yurgel, Svetlana N., **Lynch, J.**, Rice, J., Adhikari, N., & Roje, S. (2014). Quantification of Flavin Production by Bacteria. *Bio-Protocol*, 4(15): e1197.

Yurgel, Svetlana N., Rice, J., Domreis, E., **Lynch, J.**, Sa, N., Qamar, Z., Rajamani, S., Gao, M., Roje S., and Bauer W. (2014) Sinorhizobium meliloti flavin secretion and bacteria-host interaction: Role of the bifunctional RibBA protein. *Molecular Plant-Microbe Interactions*, 27(5): 437-445.

MENTORING AND TEACHING EXPERIENCE

Supervisor of Student Projects

Natalia Dudareva Lab, Purdue University 2013 – 2021

Mentored 11 undergraduate, 3 graduate, and 6 rotation students

Responsibilities: Teach techniques, assist in experimental design, evaluate progress, and refine scientific writing and presenting skills

Sanja Roje Lab, Washington State University 2008 – 2013

Mentored 4 undergraduate and 2 high school students

Responsibilities: Teach techniques, assist in experimental design, evaluate progress, and refine scientific writing and presenting skills

Guest Lecturer

BCHM 640/Hort 640 – Plant Metabolic Biochemistry, Purdue University 2020

- “Aromatic Amino Acids”

BCHM 640/Hort 640 – Plant Metabolic Biochemistry, Purdue University 2018

- “The Citric Acid Cycle”

Curriculum Vitae

- “Branched Chain Amino Acids”

Hort 640 – Plant Metabolic Biochemistry, Purdue University

2015

- “Carbohydrate Metabolism; Sucrose and Starch Synthesis”
- “Structure and Function of Lipids; Fatty Acid Biosynthesis”

SERVICE

Manuscript Reviewer	<i>Journal of Experimental Botany, Frontiers in Plant Science, Plant Physiology, Journal of Integrative Plant Biology, PNAS (w/ N. Dudareva), Nature Communications (w/ N. Dudareva), Nature Chemical Biology (w/ N. Dudareva)</i>
Grant Reviewer	NSF (w/ N. Dudareva)
Institutional Service	WVU Davis College Special Events Committee (2021) Purdue Center for Plant Biology Ambassador (2019-2021) Purdue Department of Biochemistry Safety Committee (2015-2021) Biochemistry Student-Invited Seminar Committee (2016-2017)
Outreach	Lafayette Regional Science Fair Judge (2017-2020) Purdue Summer Undergraduate Research Fellowship (SURF) Symposium Professional Judge (2016, 2018, 2019) Purdue Research Experiences for Undergraduates (REU) Poster Session Judge (2015, 2016, 2018)

PRESENTATIONS

Talks

- Biochemical Horizons Symposium, March 2020, West Lafayette, IN
- American Floral Endowment, Purdue University Tour. August 2019, West Lafayette, IN
- American Society of Plant Biologists, Midwest Regional Meeting. March 2019, Morgantown, WV
- Purdue Biochemistry Department Graduate and Postdoc Seminar Series. October 2017, West Lafayette, IN
- Purdue Biochemistry Club Meeting. September 2016, West Lafayette, IN
- Purdue Biochemistry Department Annual Retreat. August 2016, West Lafayette, IN
- Purdue Biochemistry Department Graduate and Postdoc Seminar Series. January 2016, West Lafayette, IN
- Purdue Biochemistry Department Graduate and Postdoc Seminar Series. September 2014, West Lafayette, IN
- Washington State University Plant Sciences Retreat. March 2013, Pullman, WA
- Washington State University Molecular Plant Sciences Seminar Series. February 2013, Pullman, WA
- Washington State University Molecular Plant Sciences Seminar Series. February 2012, Pullman, WA

Curriculum Vitae

- Washington State University Plant Sciences Retreat. February 2012, Pullman, WA
- Washington State University Integrated Plant Sciences Retreat. February 2010, Pullman, WA

AWARDS

Linda Siersema Staff Excellence Award, Department of Biochemistry, Purdue University, 2020 Recipient

Don Carlson Award, Department of Biochemistry, Purdue University, 2018 recipient

Loyal H. Davis Fellowship, Institute of Biological Chemistry, Washington State University, 2012-2013 Recipient