SARAH E. O'CONNOR
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Department of Natural Product Biosynthesis
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Education

2001 PhD, Organic Chemistry, Massachusetts Institute of Technology, Cambridge, MA
1995 BS, Chemistry, University of Chicago, Chicago, IL

Positions held

2019-	Director, Department of Natural Product Biosynthesis, Max Planck Institute of Chemical Ecology, Jena, Germany
2022-	Honorary Professor of Chemistry, Friedrich Schiller University, Jena, Germany
2011-2019	Project Leader, The John Innes Centre, Department of Biological Chemistry, Norwich, UK
2011-2019	The University of East Anglia, School of Chemistry, Norwich, UK (Honorary Professor (2015-2019), Professor (2012-2014), Lecturer (2011-2012)
2007-2011	Associate Professor of Chemistry, Massachusetts Institute of Technology, Cambridge, USA
2003-2007	Assistant Professor of Chemistry, Massachusetts Institute of Technology, Cambridge, USA
2000-2003	Post-doctoral Fellow in Biochemistry, Harvard Medical School, Boston, USA

Honours and Prizes

2026	Elected Member of the American Academy of Arts and Sciences
2024	Honoris causa, University of Tours
2024	Prelog Medal
2024	Elected Member of the Germany Academy of Sciences Leopoldina
2023	Gottfried Wilhelm Leibniz-Preis
2023	Elected Fellow of the Royal Society
2023	Elected Fellow of the American Society of Pharmacognosy
2022	ACS Ernest Guenther Award in the Chemistry of Natural Products
2019	RSC Perkin Prize for Organic Chemistry
2017	Elected to EMBO membership
2017	ERC Advanced Grant
2013	Wain Medal
2012	ERC Consolidator Grant
2011	Royal Society Wolfson Research Merit Award
2011	ACS Pfizer Award in Enzyme Chemistry
2007	Sloan Research Fellowship
2007	Arthur Neisch Award of the North American Phytochemical Society
2007	American Cancer Society Research Scholar
2005	Beckman Young Investigator
2004	Latham Family Career Development Professor
2003	Smith Family Medical Foundation New Investigator
2000	ACS Irving S. Sigal Postdoctoral Fellowship, Harvard Medical School
1998	ACS Organic Division Graduate Fellowship, California Institute of Technology
1998	Distinguished Graduate Student Everhart Lecture, California Institute of Technology

Panels and Committees
Chair of the Perspective Committee, BMS Section, Max Planck Society (2024-2027)
Associate Editor, Journal of Biological Chemistry (2022-)
Advisory Board, VIB (Ghent), (2025-present), HKI Leibniz Institute (2024- present)
Panel Member, ERC Consolidator Grant (2017-2023)
Associate Editor, Science Advances (2018-2023)
Associate Editor ACS Synthetic Biology (2017- 2019)
Editorial Advisory Board ACS Central Science
Editorial Advisory Board ACS Chemical Biology
Editorial Advisory Board ACS Bioorganic and Medicinal Chemistry
Editorial Advisory Board Natural Products Reports
Editorial Advisory Board Metabolic Engineering
Editorial Advisory Board ChemBioChem
Scientific Advisory Board, Ayana (2022-)
Scientific Advisory Board, Entheos (2022-)
Scientific Advisory Board, Terpnet (2015-)
Scientific Advisory Board, Helmholtz Foundation, Karlsruhe Institute of Technology (2015-2018)
Member, European Research Council Grant Review Panel (2018-2024)
Member, Industrial Biotechnology and Bioenergy Strategy Advisory Panel (BBSRC) (2016-2019)
Member, Newton Foundation Fellowship Committee (2015-2021)
Member, BBSRC Panel D (2013-2016)
Chair of the Plant Metabolic Gordon Research Conference (2015)
Chair EMBL Symposium on Plant Metabolism (2024)

Invited Lectures (selected from 2023-2026)
• Fall ACS Meeting, Plenary Lecture, Natural Products as Inspiration, online, 08/2026
• University of Pennsylvania, Lucy Hirschmann Visiting Professor, Philadelphia, 09/2026
• Biocatalysis Gorden Research Conference, New Hampshire, 07/2026
• Directing Biosynthesis, Keynote Speaker, Manchester, 06/2026
• International Synthetic Biology Conference, EMBO Keynote Speaker, Barcelona, 06/2026
• University of Cambridge, Department of Plant Sciences, Enid MacRobbie Lecture, 06/2026
• Department of Chemistry Princeton, Princeton, 05/2026
• Groningen Molecular Chemistry Symposium, Keynote Speaker, Groningen, 05/2026
• TUM Department of Chemistry. Munich. 04/2026
• ACS Spring Meeting, Division of Medicinal Chemistry, Invited Speaker, online, 03/2026
• Frontiers in Medicinal Chemistry, Keynote Speaker, Münster, 03/2026
• CDLab Symposium, University of Vienna, Department of Chemistry, 03/2026
• SNP2Prot Seminar series, Halle, 01/2026
• Leibniz Plant Sciences Institute, Gatersleben, 01/2026
• Emerging Applications of Microbes (VIB) Plenary Speaker, Leuvan, 11/2025
• Yale University, Chemical Biology Retreat, Keynote Speaker, New Haven,10/2025
• 5th Virtual ChemBio Symposium, Keynote Speaker, online, 10/2025
• University of Cardiff, Keynote Speaker, Chemistry Symposium, 05/2025
• Peking University, Department of Chemistry, 05/2025
• Peking University, Department of Biology, 05/2025
• University of Hannover, Department of Chemistry, 04/2025
• Cold Spring Harbour Laboratories, 04/2025
• German Mass Spectrometry Conference, Göttingen, Plenary Lecture, 03/2025
• 2024 International Conference of the Korean Society for Molecular and Cellular Biology, 10/24
• EMBL Chemical Biology Symposium, Keynote Speaker, Heidelberg, 09/24
• LMU, Department of Biology, Munich, 06/24
• Academic Lecture Program of the Carl Friedrich von Siemens Stiftung, Munich, 06/24
• University of Leiden, Department of Plant Biology, 05/24
• ETH, Department of Plant Biology, Zurich, 05/24
• Invited Speaker, ACS Meeting, New Orleans, 03/24
• University of York, Department of Biology, 03/24

• University of North Texas, BioDiscovery Institute Distinguished Lecture series, Denton, 02/24
• IMPRS-LM Distinguished Guests Seminar Series 2023/2024 at the MPI in Dortmund 01/24
• Cold Spring Harbour Conference, Plant Genomes, Systems Biology & Engineering, Keynote, 12/23
• Groupe d'Etude en Chimie Organique, Vanne, 08/23
• 2023 GRC for Natural Products, Andover, 7/23
• Helmholtz Institute of Infection Biology, Saarbrucken, 05/23
• University Wisconsin-Madison, Chemistry Department, 04/23
• ACS Medicinal Chemistry Workshop, Keynote, Bonn, 03/23
• 2023 GRC for Plant Herbivore Interactions, Keynote, Ventura, 03/23

Current and Past Group Members

PhD students

2003-2008	Elizabeth McCoy (BA Hamline College)
2005-2010	Peter Bernhardt (MS University of Minnesota)
2005-2011	Lesley Ann Giddings (BS Smith College)
2005-2011	Nancy Yerkes (BS Columbia University)
2006-2011	Weerawat Ricky Runguphan (BS Harvard University)
2007-2011	Johnathan Cheng (BS University of Hawaii)
2008-2013	Weslee Glenn (BS Hampton College)
2012-2015	Richard Payne (Degree Oxford)
2012-2016	Anna Stavrindes (Diploma Montpellier)
2012-2015	Franziska Kellner (Diploma University of Applied Sciences Dresden)
2018-2022	Lira Palmer (BS University of California Irvine)
2019-2023	Dagny Grzech (BS University of East Anglia)
2019-2023	Chloe Langley (BS University of Leicester)
2019-2023	Mohamed Omar Kamileen (BS University of East Anglia)
2020-2024	Marianna Boccia (MS University of Naples)
2021-2025	Mathilde Florean (MS University of Padua)
2021-2025	Anh Hai Vu (MS Uppsula University)
2022-2026	Maithili Datta (MS IISER Kolkata)
2023-2027	Sönke Beewen (MS University of Gottingen)
2023-2027	Angeliki Stathaki (MS Athens)
2024-2028	Tingan Zhou (MS Imperial)
2025-2029	Susan Schlüter (MS University of Jena)
2026-2030	Jianlin Zou (MS Peking University)

Post-Doctorals

2005-2006	Carman Galan (PhD University of Georgia)
2005-2007	Shi Chen (PhD Shanghai Jiaotong University)
2004-2008	Justin Maresh (PhD University of Chicago)
2007-2008	Xudong Qu (PhD Shanghai Institute of Organic Chemistry)
2007- 2010	Aimee Usera (PhD Johns Hopkins University)
2008- 2010	Hyang Yeol Lee (PhD University of Michigan)
2008- 2011	Nathan Nims (PhD UMass Amherst)
2009- 2011	David Liscombe (PhD University of Calgary)
2011-2013	John Cheng (PhD MIT)
2010-2014	Fernando Geu-Flores (PhD University of Copenhagen)
2011-2016	Nat Sherden (PhD Caltech)
2012-2016	Stephanie Brown (PhD Harvard)
2013-2014	Fionn O'Hara (PhD University of Cambridge)
2014-2016	Hajo Kries (PhD ETH)
2013-2017	Dorota Jakubczyk (PhD Universitat Karlsruhe)
2013-2017	Evangelos Tatsis (PhD University of Ioannina)
2015-2018	Jakob Franke (PhD HKI, University of Jena)
2015-2018	Thuy Dang (PhD University of Calgary)
2016-2018	Don Nguyen (PhD University of Calgary)

2016-2018	Benjy Lichman (PhD University College London)
2016-2019	Scott Farrow (PhD University of Calgary)
2020- 2021	Yindi Jiang (PhD UT Southwestern)
2019-2022	Francesco Trenti (PhD University of Hamburg)
2018-2022	Quentin Dudley (PhD Northwestern University)
2017-2022	Carlos Carlos Rodríguez-López (PhD Universidad de Monterrey)
2017-2022	Kotaro Yamamoto (PhD University of Kobe)
2019-2022	Nestor Hernandaez (PhD University of Wisconsin)
2021-present	Maricel Santoro (PhD Universidad Nacional de Río Cuarto)
2018-present	Matt Demars (PhD University of Michigan)
2020-present	Benke Hong (PhD Peking University)
2021-present	Prashant Sonawane (PhD Pune) (Junior Group Leader)
2021-present	Maite Colinas Martinez (PhD University of Geneva)
2021-present	Carsten Schotte (PhD University of Hamburg)
2022-present	Blaise Kimbali Lombe (PhD University of Würzburg)
2023-present	Allwin McDonald (PhD University of Wisconsin)
2023-present	Gabriel Tichiner (PhD University of Manchester)
2023-present	Ryan Alam (PhD University College Cork)
2023-present	Moonyoung Kang (PhD Seoul, KAIST)
2023-present	Ling Chuang (PhD University of Hannover)
2024-present	Houchao Xu (PhD University of Bonn)
2024-present	Sam Carr (PhD University of Calgary)
2024-present	Qi Ding (PhD Peking University)
2025-present	Gyumin Kang (PhD Seoul, KAIST)
2025-present	Mohamed Omar Kamileen (PhD Y University of ork)
2025-present	Song Wu (PhD SIPPE, Shanghai)
2026-present	Shivansh Mahajan (PhD Caltech)
2026-present	Shenyu Liu (PhD University of Hannover)
2026-present	Xu Lu (PhD University of British Columbia)

Staff Scientists/Group Leaders

2013-present	Lorenzo Caputi, scientist (PhD University of York)
2019-	Stefan Bartram (PHD Universitat Bonn)
2020-present	Tobias Köllner (PhD Friedrich Schiller University)
2021-present	Yoko Nakamura (PhD Friedrich Schiller University) (joint with NMR Group)
2022-present	Klaus Gase (PhD Friedrich Schiller University)

Technicians and Engineers

Kati Bartel
Anja David
Katrin Luck
Sarah Heinicke
Maritta Kunert
Jens Wurlitzer
Kerstin Ploß

Publications

* denotes corresponding author

2026

Lombe, B. K., Zhou, T., Kang, G., Wood, J. C., Hamilton, JP, Gase, K., Nakamura, Y., Alam, R. M., Dirks, R. P., Caputi, L., Buell, C. R.*, O'Connor, S. E.* (2026) Biosynthesis of cinchona alkaloids. *Nature.* 2026 doi: 10.1038/s41586-026-10227-x.

Calderini, O.*, Kamileen, M. O., Nakamura, Y., Heinicke, S., Alam, R. M., Hong, B., Jiang, Y., Gutierrez-Vences, A., Alagna, F., Paolocci, F., Valeri, M. C., Franco, E., Mousavi, S., Mariotti, R., Caputi, L., O'Connor, S. E.*, & Rodriguez-Lopez, C. E.* (2026). Comparative transcriptomic and co-expression analyses enable the discovery of key enzymes responsible for oleuropein biosynthesis in olive (*Olea europaea*). *Plant Communications,* 101713. doi:10.1016/j.xplc.2026.101713.

Florean, M., Schultz, H., Grabe, V., Luck, K., O'Connor, S. E.*, & Köllner, T. G.* (2026). A pseudoenzyme enables indole biosynthesis in eudicot plants. *Nature Chemical Biology, 22*, 120-127. doi:10.1038/s41589-025-01943-y.

Datta, M., Luck, K., Wu, S., Chen, F., Ulrich, Y., O'Connor, S. E.*, & Köllner, T. G.* (2026). Independent evolution of geraniol-8-hydroxylase activity involved in iridoid formation in the Argentine ant (*Linepithema humile*). *Insect Biochemistry and Molecular Biology, 186*: 104441. doi:10.1016/j.ibmb.2025.104441.

Carr, S. C., McDonald, A., Langley, C., Grabe, V., Gase, K., & O'Connor, S. E.* (2026). Protein-protein interactions modulate a key branch point in monoterpene indole alkaloid biosynthesis. *ACS Chemical Biology, 21*(1), 8-13. doi:10.1021/acschembio.5c00485.

Morweiser, C., Heinicke, S., O'Connor, S. E., & Colinas, M.* (2026). Discovery of a plant pictet-spenglerase with R-stereoselectivity. *Angew. Chem. Intl. Ed. in press.*

2025

Vu, H. A., Caputi, L.*, & O'Connor, S. E.* (2025). Isotopic labeling analysis using single cell mass spectrometry. *Analyst, 150*(22), 4918-4924. doi:10.1039/d5an00657k.

Colinas, M., Tymen, C., Wood, J. C., David, A., Wurlitzer, J., Morweiser, C., Gase, K., Alam, R. M., Titchiner, G. R., Hamilton, J. P., Heinicke, S., Dirks, R. P., Lopes, A. A., Caputi, L., Buell, C. R., & O'Connor, S. E.* (2025). Discovery of iridoid cyclase completes the iridoid pathway in asterids. *Nature Plants, 111*, 2204-2216. doi:10.1038/s41477-025-02122-6.

Frey, M.*, Gohr, S. T., Köllner, T. G., Bathe, U., Lackus, N. D., Padilla-Gonzalez, F., Ro, D.-K., O'Connor, S. E., Degenhardt, J. O. l., & Tissier, A. (2025). Biosynthesis of biologically active terpenoids in the mint family (Lamiaceae). *Natural Product Reports, 42*(11), 1887-1908. doi:10.1039/d5np00026b.

Kang, M., Vu, H. A., Casper, A. L., Kim, R., Wurlitzer, J., Heinicke, S., Yeroslaviz, A., Caputi, L.*, & O'Connor, S. E.* (2025). Single-cell metabolome and RNA-seq multiplexing on single plant cells. *Proceedings of the National Academy of Sciences of the United States of America, 122*(43): e2512828122. doi:10.1073/pnas.2512828122.

Alam, R. M.*, Nakamura, Y., Bartram, S., Ueberschaar, N., Zetzsche, T., Ulrich, Y., O'Connor, S. E.*, & Köllner, T. G.* (2025). Identification and stereoselective total synthesis of an insect homosesquiterpene from the clonal raider ant *Ooceraea biroi*. *Journal of Natural Products, 88*(9), 2107-2116. doi:10.1021/acs.jnatprod.5c00656.

O'Connor, S. E.* (2025). Sarah E. O'Connor. *New Phytologist, 247*(6), 2514-2516. doi:10.1111/nph.70394.

Schotte, C., Florean, M., Czechowski, T., Gilday, A., Alam, R. M., Ploß, K., Wurlitzer, J., Li, Y., Sonawane, P.*, Graham, I. A.*, & O'Connor, S. E.* (2025). Identification of BAHD-acyltransferase enzymes involved in ingenane diterpenoid biosynthesis. *New Phytologist, 247*(6), 2591-2600. doi:10.1111/nph.70388.

Laezza, C., Heinicke, S., Wurlitzer, J., D'Amelia, V., Caputi, L.*, Rigano, M. M.*, & O'Connor, S. E.* (2025). Single-cell mass spectrometry reveals heterogeneous triterpenic acid accumulation in apple callus-derived cells. *Plant Biotechnology Journal, 23*(8), 3414-3416. doi:10.1111/pbi.70174.

Colinas, M.*, Morweiser, C., Dittberner, O., Chioca, B., Alam, R. M., Leucke, H., Nakamura, Y., Serna Guerrero, D. A., Heinicke, S., Kunert, M., Wurlitzer, J., Ploss, K., Hong, B., Grabe, V., Lopes, A. A., & O'Connor, S. E.* (2025). Ipecac alkaloid biosynthesis in two evolutionarily distant plants. *Nature Chemical Biology, 23*(8), 3414-3416. doi:10.1038/s41589-025-01926-z.

McDonald, A., Nakamura, Y., Schotte, C., Titchiner, G. R., Lau, K., Alam, R. M., Lopes, A. A., Buell, C. R., & O'Connor, S. E.* (2025). Enzymatic epimerization of monoterpene indole alkaloids in Kratom. *Nature Chemical Biology, 22*, 229-238. doi:10.1038/s41589-025-01970-9.

Zschoche, N., Schober, S., Walther, K., Chadeayne, A. R., Gressler, M., Bartram, S., O'Connor, S. E., & Hoffmeister, D.* (2025). Clade III synthases add cyclic and linear terpenoids to the *Psilocybe* metabolome. *ChemBioChem: A European Journal of Chemical Biology, 26*(13): e202500167. doi:10.1002/cbic.202500167.

Carr, S. C., & O'Connor, S. E.* (2025). A tight-knit family: The medium-chain dehydrogenase/reductases of monoterpene indole alkaloid biosynthesis. *Biochemistry, 64*(13), 2712-2726. doi:10.1021/acs.biochem.5c00234.

Kamileen, M. O., Hong, B., Gase, K., Kunert, M., Caputi, L., Lichman, B. R., & O'Connor, S. E.* (2025). Oxidative rearrangements of the alkaloid intermediate geissoschizine. *Angewandte Chemie, International Edition in English, 64*(24): e202501323. doi:10.1002/anie.202501323.

Caputi, L.*, & O'Connor, S. E. (2025). Flowers with bad breath: How an old gene acquired a new function to exploit an insect's sense of smell. *Science, 388*(6747), 586-587. doi:10.1126/science.adx4375.

Stathaki, A., Alam, R. M., Köllner, T. G.*, & O'Connor, S. E.* (2025). Engineering of insect juvenile hormone III biosynthesis in the plant *Nicotiana benthamiana*. *Metabolic Engineering, 88*, 77-84. doi:10.1016/j.ymben.2024.12.005.

Kamileen, M. O., Nakamura, Y., Siegmund, M., Keshan, R., Grabe, V., Heinicke, S., Kunert, M., Hong, B., Alam, R. M., Kang, G., Caputi, L., & O'Connor, S. E.* (2025). Conserved early steps of stemmadenine biosynthesis. *Journal of Biological Chemistry, 302*(2): 111120. doi:10.1016/j.jbc.2025.111120.

Kimbadi Lombe, B., Zhou, T., Caputi, L., Ploss, K., & O'Connor, S. E.* (2025). Biosynthetic origin of the methoxy group in quinine and related alkaloids. *Angewandte Chemie International Edition, 64*(5): e202418306. doi:10.1002/anie.202418306.

Florean, M., Schultz, H., Wurlitzer, J., O'Connor, S. E.*, & Köllner, T. G.* (2025). Independent evolution of plant natural products: Formation of benzoxazinoids in *Consolida orientalis* (Ranunculaceae). *Journal of Biological Chemistry, 301*(1): 108019. doi:10.1016/j.jbc.2024.108019.

Grzech, D., Smit, S. J., Alam, R. M., Boccia, M., Nakamura, Y., Hong, B., Barbole, R., Heinicke, S., Kunert, M., Seibt, W., Grabe, V., Caputi, L., Lichman, B. R., O'Connor, S. E.*, Aharoni, A.*, & Sonawane, P. D.* (2025). Incorporation of nitrogen in antinutritional *Solanum* alkaloid biosynthesis. *Nature Chemical Biology, 21*, 131-142. doi:10.1038/s41589-024-01735-w.

Li, C., Colinas, M., Wood, J. C., Vaillancourt, B., Hamilton, J. P., Jones, S. L., Caputi, L.*, O'Connor, S. E.*, & Buell, C. R.* (2025). Cell-type-aware regulatory landscapes governing monoterpene indole alkaloid biosynthesis in the medicinal plant *Catharanthus roseus*. *New Phytologist, 245*(1), 347-362. doi:10.1111/nph.20208.

2024

Chen, X., Urban, J. M., Wurlitzer, J., Wei, X., Han, J., O'Connor, S. E., Rudolf, J. D., Köllner, T. G., & Chen, F.* (2024). Canonical terpene synthases in arthropods: Intraphylum gene transfer. *Proceedings of the*

National Academy of Sciences of the United States of America, 121(51): e2413007121. doi:10.1073/pnas.2413007121.

Lezin, E., Durand, M., Williams, C. B., Vazquez, A. L. L., Perrot, T., Gautron, N., Petrignet, J., Cuello, C., Jansen, H., Magot, F., Szwarc, S., Le Pogam, P., Beniddir, M., Koudounas, K., Oudin, A., St-Pierre, B., Giglioli-Guivarch, N., Sun, C., Papon, N., Jensen, M. K., Dirks, R., O'Connor, S. E., Besseau, S.*, & Courdavault, V.* (2024). Genome-based discovery of pachysiphine synthases in *Tabernaemontana elegans*. *The Plant Journal, 120*(5), 1880-1900. doi:10.1111/tpj.17085.

Boccia, M., Ploß, K., Kunert, M., Keshan, R., Hatam, M., Grabe, V., O'Connor, S. E.*., & Sonawane, P. D.* (2024). Metabolic engineering of vitamin D3 in Solanaceae plants. *Plant Biotechnology Journal, 22*(12), 3389-3391. doi:10.1111/pbi.14459.

Boccia, M., Kessler, D., Seibt, W., Grabe, V., Rodriguez Lopez, C. E., Grzech, D., Heinicke, S., O'Connor, S. E.*, & Sonawane, P. D.* (2024). A scaffold protein manages the biosynthesis of steroidal defense metabolites in plants. *Science, 386*(6728), 1366-1372. doi:10.1126/science.ado3409.

Yang, C.*, Halitschke, R., O'Connor, S. E., & Baldwin, I. T.* (2024). Roles of three cytochrome P450 monooxygenases in triterpene biosynthesis and their potential impact on growth and development. *Plant Physiology, 196*(2), 1407-1425. doi:10.1093/plphys/kiae399.

Kamileen, M. O., Nakamura, Y., Luck, K., Heinicke, S., Hong, B., Colinas, M., Lichman, B. R., & O'Connor, S. E.* (2024). Streamlined screening platforms lead to the discovery of pachysiphine synthase from *Tabernanthe iboga*. *New Phytologist, 244*(4), 1437-1449. doi:10.1111/nph.20133.

Lucier, R., Kamileen, M. O., Nakamura, Y., Serediuk, S., Barbole, R., Wurlitzer, J., Kunert, M., Heinicke, S., O'Connor, S. E.*, & Sonawane, P. D.* (2024). Steroidal scaffold decorations in *Solanum* alkaloid biosynthesis. *Molecular Plant, 17*(8), 1236-1254. doi:10.1016/j.molp.2024.06.013.

Vu, A. H., Kang, M., Wurlitzer, J., Heinicke, S., Li, C., Wood, J. C., Grabe, V., Buell, C. R., Caputi, L.*, & O'Connor, S. E.* (2024). Quantitative single-cell mass spectrometry provides a highly resolved analysis of natural product biosynthesis partitioning in plants. *Journal of the American Chemical Society, 146*(34), 23891-23900. doi:10.1021/jacs.4c06336.

O'Connor, S. E.* (2024). Reduction hits the sweet spot: A revised biosynthesis of dolichol. *Cell, 187*(14), 3502-3503. doi:10.1016/j.cell.2024.05.006.

Uzaki, M., Mori, T., Sato, M., Wakazaki, M., Takeda-Kamiya, N., Yamamoto, K., Murakami, A., Guerrero, D. A. S., Shichijo, C., Ohnishi, M., Ishizaki, K., Fukaki, H., O'Connor, S. E., Toyooka, K., Mimura, T.*, & Hirai, M. Y.* (2024). Integration of cell differentiation and initiation of monoterpenoid indole alkaloid metabolism in seed germination of *Catharanthus roseus*. *New Phytologist, 242*(3), 1156-1171. doi:10.1111/nph.19662.

Lezin, E., Carqueijeiro, I., Cuello, C., Durand, M., Jansen, H. J., Vergès, V., Williams, C. B., Oudin, A., Dugé de Bergonville, T., Petrignet, J., Celton, N., St-Pierre, B., Papon, N., Sun, C., Dirks, R. P., O'Connor, S. E., Jensen, M. K., Besseau, S.*, & Courdavault, V.* (2024). A chromosome-scale genome assembly of *Rauvolfia tetraphylla* facilitates the identification of the complete ajmaline biosynthetic pathway. *Plant Communications, 5*(4): 100784. doi:10.1016/j.xplc.2023.100784.

Cuello, C., Jansen, H. J., Abdallah, C., Mbadinga, D.-L.-Z., Williams, C. B., Durand, M., Oudin, A., Papon, N., Giglioli-Guivarc'h, N., Dirks, R. P., Jensen, M. K., O'Connor, S. E., Besseau, S.*, & Courdavault, V.* (2024). The Madagascar palm genome provides new insights on the evolution of Apocynaceae specialized metabolism. *Heliyon, 10*(6): e28078. doi:10.1016/j.heliyon.2024.e28078.

DeMars II, M. D., & O'Connor, S. E.* (2024). Evolution and diversification of carboxylesterase-like [4+2] cyclases in *Aspidosperma* and iboga alkaloid biosynthesis. *Proceedings of the National Academy of Sciences of the United States of America, 121*(7): e2318586121. doi:10.1073/pnas.2318586121.

Dror, M. J., Misa, J., Yee, D. A., Chu, A. M., Yu, R. K., Chan, B. B., Aoyama, L. S., Chaparala, A. P., O'Connor, S. E., & Tang, Y.* (2024). Engineered biosynthesis of plant heteroyohimbine and corynantheine alkaloids in *Saccharomyces cerevisiae*. *Journal of Industrial Microbiology & Biotechnology, 51*: kuad047. doi:10.1093/jimb/kuad047.

Yang, C.*, Halitschke, R., & O'Connor, S. E.* (2024). OXIDOSQUALENE CYCLASE 1 and 2 influence triterpene biosynthesis and defense in *Nicotiana attenuata*. *Plant Physiology, 194*(4), 2580-2599. doi:10.1093/plphys/kiad643.

Stander, E. A., Lehka, B., Carqueijeiro, I., Cuello, C., Hansson, F. G., Jansen, H. J., Dugé de Bergonville, T., Williams, C. B., Vergès, V., Lezin, E., Lorensen, M. D. B. B., Dang, T.-T., Oudin, A., Lanoue, A., Durand, M., Giglioli-Guivarch, N., Janfelt, C., Papon, N., Dirks, R. P., O'Connor, S. E.*, Jensen, M. K.*, Besseau, S.*, & Courdavault, V.* (2023). The *Rauvolfia tetraphylla* genome suggests multiple distinct biosynthetic routes for yohimbane monoterpene indole alkaloids. *Communications Biology, 6*: 1197. doi:10.1038/s42003-023-05574-8.

Schäfer, E., Seibold, P. S., Bartram, S., Trottmann, F., Haensch, V. G., Gressler, M., Chadeayne, A. R., Hertweck, C., O'Connor, S. E., & Hoffmeister, D.* (2023). A „magic mushroom" multi-product sesquiterpene synthase. *ChemBioChem: A European Journal of Chemical Biology, 24*(21): e202300511. doi:10.1002/cbic.202300511.

2023

Bradley, S. A., Lehka, B. J., Hansson, F. G., Adhikari, K. B., Rago, D., Rubaszka, P., Haidar, A. K., Chen, L., Hansen, L. G., Gudich, O., Giannakou, K., Lengger, B., Gill, R. T., Nakamura, Y., Dugé de Bergonville, T., Koudounas, K., Romero-Suarez, D., Ding, L., Qiao, Y., Frimurer, T. M., Petersen, A. A., Besseau, S., Kumar, S., Gautron, N., Melin, C., Marc, J., Jeanneau, R., O'Connor, S. E., Courdavault, V., Keasling, J. D., Zhang, J.*, & Jensen, M. K.* (2023). Biosynthesis of natural and halogenated plant monoterpene indole alkaloids in yeast. *Nature Chemical Biology, 19*, 1551-1560. doi:10.1038/s41589-023-01430-2.

Florean, M., Luck, K., Hong, B., Nakamura, Y., O'Connor, S. E.*, & Köllner, T. G.* (2023). Reinventing metabolic pathways: Independent evolution of benzoxazinoids in flowering plants. *Proceedings of the National Academy of Sciences of the United States of America, 120*(42): e2307981120. doi:10.1073/pnas.2307981120.

Kunert, M., Langley, C., Lucier, R., Ploß, K., Rodriguez Lopez, C. E., Serna Guerrero, D. A., Rothe, E., O'Connor, S. E.*, & Sonawane, P. D.* (2023). Promiscuous CYP87A enzyme activity initiates cardenolide biosynthesis in plants. *Nature Plants, 9*, 1607-1617. doi:10.1038/s41477-023-01515-9.

Stephan, P., Langley, C., Winkler, D., Basquin, D. J., Caputi, L., O'Connor, S. E., & Kries, D. H.* (2023). Gerichtete Evolution von Piperazinsäureeinbau durch eine Nichtribosomale Peptidsynthetase. *Angewandte Chemie, 135*(35): e202304843. doi:10.1002/ange.202304843.

Stephan, P., Langley, C., Winkler, D., Basquin, J., Caputi, L., O'Connor, S. E., & Kries, H.* (2023). Directed evolution of piperazic acid incorporation by a nonribosomal peptide synthetase. *Angewandte Chemie International Edition, 62*(35): e202304843. doi:10.1002/anie.202304843.

Li, C., Wood, J. C., Vu, H. A., Hamilton, J. P., Lopez, C. E. R., Payne, R. M. E., Serna Guerrero, D. A., Gase, K., Yamamoto, K., Vaillancourt, B., Caputi, L.*., O'Connor, S. E.* & Buell, C. R.* (2023). Single-cell multi-omics in the medicinal plant *Catharanthus roseus*. *Nature Chemical Biology, 19*(8), 1031-1041. doi:10.1038/s41589-023-01327-0.

Sonawane, P. D.*, Gharat, S. A., Jozwiak, A., Barbole, R., Heinicke, S., Almekias-Siegl, E., Meir, S., Rogachev, I., O'Connor, S. E., Giri, A. P., & Aharoni, A.* (2023). A BAHD-type acyltransferase concludes the biosynthetic pathway of non-bitter glycoalkaloids in ripe tomato fruit. *Nature Communications, 14*: 4540. doi:10.1038/s41467-023-40092-5.

Lawas, L. M. F., Kamileen, M. O., Buell, C. R., O'Connor, S. E., & Leisner, C. P.* (2023). Transcriptome-based identification and functional characterization of iridoid synthase involved in monotropein biosynthesis in blueberry. *Plant Direct, 7*(7): e512. doi:10.1002/pld3.512.

Laforest, L. C., Kuntz, M. A., Kanumuri, S. R. R., Mukhopadhyay, S., Sharma, A., O'Connor, S. E., McCurdy, C. R., & Nadakuduti, S. S.* (2023). Metabolite and molecular characterization of *Mitragyna speciosa* identifies developmental and genotypic effects on monoterpene indole and oxindole alkaloid composition. *Journal of Natural Products, 86*(4), 1042-1052. doi:10.1021/acs.jnatprod.3c00092.

Lorensen, M. D. B. B., Bjarnholt, N., St-Pierre, B., Heinicke, S., Courdavault, V., O'Connor, S. E., & Janfelt, C.* (2023). Spatial localization of monoterpenoid indole alkaloids in *Rauvolfia tetraphylla* by high resolution mass spectrometry imaging. *Phytochemistry, 209*: 113620. doi:10.1016/j.phytochem.2023.113620.

Schotte, C., Jiang, Y., Grzech, D., Dang, T.-T.-T., Laforest, L. C., León, F., Mottinelli, M., Nadakuduti, S. S., McCurdy, C. R., & O'Connor, S. E.* (2023). Directed biosynthesis of mitragynine stereoisomers. *Journal of the American Chemical Society, 145*(9), 4957-4963. doi:10.1021/jacs.2c13644.

Grzech, D., Hong, B., Caputi, L., Sonawane, P. D., & O'Connor, S. E.* (2023). Engineering the biosynthesis of late-stage vinblastine precursors precondylocarpine acetate, catharanthine, tabersonine in *Nicotiana benthamiana*. *ACS Synthetic Biology, 12*(1), 27-34. doi:10.1021/acssynbio.2c00434.

2022

Cuello, C., Stander, E. A., Jansen, H. J., Dugé de Bergonville, T., Oudin, A., Williams, C. B., Lanoue, A., Guivarc'h, N. G., Papon, N., Dirks, R. P., Jensen, M. K., O'Connor, S. E., Besseau, S., & Courdavault, V.* (2022). An updated version of the Madagascar periwinkle genome. *F1000Research, 11*: 1541. doi:10.12688/f1000research.129212.1.

Stander, E. A., Cuello, C., Birer-Williams, C., Kulagina, N., Jansen, H., Carqueijeiro, I., Méteignier, L.-V., Vergès, V., Oudin, A., Papon, N., Dirks, R., Jensen, M. K., O'Connor, S. E., Dugé de Bergonville, T., Besseau, S., & Courdavault, V.* (2022). The *Vinca minor* genome highlights conserved evolutionary traits in monoterpene indole alkaloid synthesis. *G3: Genes, Genomes, Genetics, 12*(12): jkac268. doi:10.1093/g3journal/jkac268.

Langley, C., Tatsis, E. E., Hong, B., Nakamura, Y., Paetz, C., Stevenson, C. E. M., Basquin, J., Lawson, D. M., Caputi, L.*, & O'Connor, S. E.* (2022). Expansion of the catalytic repertoire of alcohol dehydrogenases in plant metabolism. *Angewandte Chemie, International Edition in English, 61*(48): e202210934. doi:10.1002/anie.202210934.

Kamileen, M. O., DeMars II, M. D., Hong, B., Nakamura, Y., Paetz, C., Lichman, B. R., Sonawane, P. D., Caputi, L.*, & O'Connor, S. E.* (2022). Recycling upstream redox enzymes expands the regioselectivity of cycloaddition in Pseudo-*Aspidosperma* alkaloid biosynthesis. *Journal of the American Chemical Society, 144*(43), 19673-19579. doi:10.1021/jacs.2c08107.

Cuello, C., Stander, E. A., Jansen, H. J., Dugé de Bernonville, T., Lanoue, A., Giglioli-Guivarch, N., Papon, N., Dirks, R. P., Jensen, M. K., O'Connor, S. E., Bessau, S., & Courdavault, V.* (2022). Genome assembly of the medicinal plant *Voacanga thouarsii*. *Genome Biology and Evolution, 14*(11): evac158. doi:10.1093/gbe/evac158.

Palmer, L., Chuang, L., Siegmund, M., Kunert, M., Yamamoto, K., Sonawane, P. D., & O'Connor, S. E.* (2022). In vivo characterization of key iridoid biosynthesis pathway genes in catnip (*Nepeta cataria*). *Planta, 256*(5): 99. doi:10.1007/s00425-022-04012-z.

Köllner, T. G.*, David, A., Luck, K., Beran, F., Kunert, G., Zhou, J.-J., Caputi, L., & O'Connor, S. E.* (2022). Biosynthesis of iridoid sex pheromones in aphids. *Proceedings of the National Academy of Sciences of the United States of America, 119*(42): e2211254119. doi:10.1073/pnas.2211254119.

Dudley, Q. M., Jo, S., Serna Guerrero, D. A., Chhetry, M., Smedley, M. A., Harwood, W. A., Sherden, N. H., O'Connor, S. E., Caputi, L.*, & Patron, N. J.* (2022). Reconstitution of monoterpene indole alkaloid biosynthesis in genome engineered *Nicotiana benthamiana*. *Communications Biology, 5*: 949. doi:10.1038/s42003-022-03904-w.

Zhang, J., Hansen, L. G., Gudich, O., Viehrig, K., Lassen, L. M. M., Schrübbers, L., Adhikari, K. B., Rubaszka, P., Carrasquer-Alvarez, E., Chen, L., D'Ambrosio, V., Lehka, B., Haidar, A. K., Nallapareddy, S., Giannakou, K., Laloux, M., Arsovska, D., Jørgensen, M. A. K., Chan, L. J. G., Kristensen, M., Christensen, H. B., Sudarsan, S., Stander, E. A., Baidoo, E., Petzold, C. J., Wulff, T., O'Connor, S. E., Courdavault, V., Jensen, M. K.*, & Keasling, J. D.* (2022). A microbial supply chain for production of the anti-cancer drug vinblastine. *Nature, 609*, 341-347. doi:10.1038/s41586-022-05157-3.

Hernández-Lozada, N. J., Hong, B., Wood, J. C., Caputi, L., Basquin, J., Chuang, L., Kunert, M., Rodriguez Lopez, C. E., Langley, C., Zhao, D., Buell, C. R., Lichman, B. R., & O'Connor, S. E.* (2022). Biocatalytic routes to stereo-divergent iridoids. *Nature Communications, 13*: 4718. doi:10.1038/s41467-022-32414-w.

Hong, B., Grzech, D., Caputi, L., Sonawane, P. D., Rodriguez Lopez, C. E., Kamileen, M. O., Hernández-Lozada, N. J., Grabe, V., & O'Connor, S. E.* (2022). Biosynthesis of strychnine. *Nature, 607*, 617-622. doi:10.1038/s41586-022-04950-4.

Yamamoto, K.*, Takahashi, K., O'Connor, S. E., & Mimura, T.* (2022). Imaging MS analysis in Catharanthus roseus. In V. Courdavault, & S. Besseau (Eds.), *Catharanthus roseus: Methods and Protocols* (pp. 33-43). Totowa, New Yersey: Humana Press. doi:10.1007/978-1-0716-2349-7_2.

Boccia, M., Grzech, D., Lopes, A. A., O'Connor, S. E.*, & Caputi, L.* (2022). Directed biosynthesis of new to nature alkaloids in a heterologous *Nicotiana benthamiana* expression host. *Frontiers in Plant Science, 13*: 919443. doi:10.3389/fpls.2022.919443.

Kulagina, N., Méteignier, L.-V., Papon, N., O'Connor, S. E.*, & Courdavault, V.* (2022). More than a *Catharanthus* plant: A multicellular and pluri-organelle alkaloid-producing factory. *Current Opinion in Plant Biology, 67*: 102200. doi:10.1016/j.pbi.2022.102200.

DeMars, M., Nakamura, Y., Kamileen, M. O., Sanders, J. N., Paetz, C., Houk, K. N., & O'Connor, S. E.* (2022). Mechanism and evolution of [4+2] cyclases in monoterpene indole alkaloid biosynthesis. *Faseb Journal, 36*(S1). doi:10.1096/fasebj.2022.36.S1.R4486.

Rodriguez Lopez, C. E.*, Jiang, Y., Kamileen, M. O., Lichman, B. R., Hong, B., Vaillancourt, B., Buell, C. R., & O'Connor, S. E.* (2022). Phylogeny-aware chemoinformatic analysis of chemical diversity in Lamiaceae enables iridoid pathway assembly and discovery of aucubin synthase. *Molecular Biology and Evolution, 39*(4): msac057. doi:10.1093/molbev/msac057.

Koudounas, K., Guirimand, G., Hoyos, L. F. R., Carqueijeiro, I., Cruz, P. L., Stander, E., Kulagina, N., Perrin, J., Oudin, A., Besseau, S., Lanoue, A., Atehortùa, L., St-Pierre, B., Giglioli-Guivarc'h, N., Papon, N., O'Connor, S. E., & Courdavault, V.* (2022). Tonoplast and peroxisome targeting of gamma-tocopherol N-methyltransferase homologs involved in the synthesis of monoterpene indole alkaloids. *Plant and Cell Physiology, 63*(2): pcab160, pp. 200-216. doi:10.1093/pcp/pcab160.

2021

Courdavault, V.*, O'Connor, S. E., Jensen, M. K., & Papon, N. (2021). Metabolic engineering for plant natural products biosynthesis: new procedures, concrete achievements and remaining limits. *Natural Product Reports, 38*(12), 2145-2153. doi:10.1039/D0NP00092B.

Yamamoto, K., Grzech, D., Koudounas, K., Stander, E. A., Caputi, L., Mimura, T., Courdavault, V., & O'Connor, S. E.* (2021). Improved virus-induced gene silencing allows discovery of a serpentine synthase gene in *Catharanthus roseus*. *Plant Physiology, 187*(2), 846-857. doi:10.1093/plphys/kiab285.

Bat-Erdene, U., Billingsley, J. M., Turner, W. C., Lichman, B. R., Ippoliti, F. M., Garg, N. K., O'Connor, S. E., & Tang, a. Y.* (2021). Cell-free total biosynthesis of plant terpene natural products using an orthogonal cofactor regeneration system. *ACS Catalysis, 11*(15), 9898-9903. doi:10.1021/acscatal.1c02267.

Brose, J., Lau, K. H., Dang, T. T. T., Hamilton, J. P., do Vale Martins, L., Hamberger, B., Hamberger, B., Jiang, J., O'Connor, S. E., & Buell, C. R.* (2021). The *Mitragyna speciosa* (Kratom) Genome: a resource for data-mining potent pharmaceuticals that impact human health. *G3: Genes, Genomes, Genetics, 11*(4): jkab058. doi:10.1093/g3journal/jkab058.

Trenti, F., Yamamoto, K., Hong, B., Paetz, C., Nakamura, Y., & O'Connor, S. E.* (2021). Early and late steps of quinine biosynthesis. *Organic Letters, 23*(5), 1793-1797. doi:10.1021/acs.orglett.1c00206.

Carqueijeiro, I., Koudounas, K., Dugé de Bergonville, T., Sepúlveda, L. J., Mosquera, A., Bomzan, D. P., Oudin, A., Lanoue, A., Besseau, S., Cruz, P. L., Kulagina, N., Stander, E. A., Eymieux, S., Burlaud-Gaillard, J., Blanchard, E., Clastre, M., Atehortùa, L., St-Pierre, B., Giglioli-Guivarc'h, N., Papon, N., Nagegowda, D. A., O'Connor, S. E., & Courdavault, V.* (2021). Alternative splicing creates a pseudo-strictosidine beta-D-glucosidase modulating alkaloid synthesis in *Catharanthus roseus*. *Plant Physiology, 185*(3), 836-856. doi:10.1093/plphys/kiaa075.

Rodríguez-López, C. E., Hong, B., Paetz, C., Nakamura, Y., Koudounas, K., Passeri, V., Baldoni, L., Alagna, F.*, Calderini, O.*, & O'Connor, S. E.* (2021). Two bi-functional cytochrome P450 CYP72 enzymes from olive (*Olea europaea*) catalyze the oxidative C-C bond cleavage in the biosynthesis of secoxy-iridoids – flavor and quality determinants in olive oil. *New Phytologist, 229*(4), 2288-2301. doi:10.1111/nph.16975.

O'Connor, S. E.* (2021). Symbionts, peptides, and (no) iron: How ants defend their fungal crop. *ACS Central Science, 7*(2), 225-227. doi:10.1021/acscentsci.1c00097.

2020

Stander, E. A., Sepúlveda, L. J., Dugé de Bergonville, T., Carqueijeiro, I., Koudounas, K., Cruz, P. L., Besseau, S., Lanoue, A., Papon, N., Giglioli-Guivarc'h, N., Dirks, R., O'Connor, S. E., Atehortùa, L., Oudin, A.*, & Courdavault, V.* (2020). Identifying genes involved in alkaloid biosynthesis in *Vinca minor* through transcriptomics and gene co-expression analysis. *Biomolecules, 10*(12): 1595. doi:10.3390/biom10121595.

Davis, K., Gkotsi, D. S., Smith, D. R. M., Goss, R. J. M., Caputi, L., & O'Connor, S. E.* (2020). *Nicotiana benthamiana* as a transient expression host to produce auxin analogs. *Frontiers in Plant Science, 11*: 581675. doi:10.3389/fpls.2020.581675.

Dugé de Bernonville, T., Maury, S., Delaunay, A., Daviaud, C., Chaparro, C., Tost, J., O'Connor, S. E., & Courdavault, V.* (2020). Developmental methylome of the medicinal plant *Catharanthus roseus* unravels the tissue-specific control of the monoterpene indole alkaloid pathway by DNA methylation. *International Journal of Molecular Sciences, 21*(17): 6028. doi:10.3390/ijms21176028.

Chung, K., & O'Connor, S. E.* (2020). Biosynthesis of Vinblastine. In H.-W. Liu, & T. P. Begley (Eds.), *Comprehensive Natural Products III: Chemistry and Biology* (pp. 642-685). Amsterdam: Elsevier.

Nguyen, T.-D., & O'Connor, S. E.* (2020). The progesterone 5 beta-reductase/iridoid synthase family: A catalytic reservoir for specialized metabolism across land plants. *ACS Chemical Biology, 15*(7), 1780-1787. doi:10.1021/acschembio.0c00220.

Walia, M., Teijaro, C. N., Gardner, A., Tran, T., Kang, J., Zhao, S., O'Connor, S. E., Courdavault, V., & Andrade, R. B.* (2020). Synthesis of (−)-melodinine K: A case study of efficiency in natural product synthesis. *Journal of Natural Products, 83*(8), 2425-2433. doi:10.1021/acs.jnatprod.0c00310.

Neumann, M., Prahl, S., Caputi, L., Hill, L., Kular, B., Walter, A., Patallo, E. P., Milbredt, D., Aires, A., Schöpe, M., O'Connor, S. E., van Pée, K.-H., & Ludwig-Müller, J.* (2020). Hairy root transformation of *Brassica rapa* with bacterial halogenase genes and regeneration to adult plants to modify production of indolic compounds. *Phytochemistry, 175*: 112371. doi:10.1016/j.phytochem.2020.112371.

Courdavault, V.*, Besseau, S., Oudin, A., Papon, N., & O'Connor, S. E.* (2020). Virus-induced gene silencing: hush genes to make them talk. *Trends in Plant Science, 25*(7), 714-715. doi:10.1016/j.tplants.2020.02.013.

Dávila-Lara, A., Rodríguez-López, C. E., O'Connor, S. E., & Mithöfer, A.* (2020). Metabolomics analysis reveals tissue-specific metabolite compositions in leaf blade and traps of carnivorous *Nepenthes* plants. *International Journal of Molecular Sciences, 21*(12): 4376. doi:10.3390/ijms21124376.

Courdavault, V.*, O'Connor, S. E.*, Oudin, A., Besseau, S., & Papon, N. (2020). Towards the microbial production of plant-derived anticancer drugs. *Trends in Cancer, 6*(6), 444-448. doi:10.1016/j.trecan.2020.02.004.

Lichman, B. R.*, Godden, G. T., Hamilton, J. P., Palmer, L., Kamileen, M. O., Zhao, D., Vaillancourt, B., Wood, J. C., Sun, M., Kinser, T. J., Henry, L. K., Rodriguez Lopez, C. E., Dudareva, N., Soltis, D. E., Soltis, P. S., Buell, C. R.*, & O'Connor, S. E.* (2020). The evolutionary origins of the cat attractant nepetalactone in catnip. *Science Advances, 6*(20): eaba0721. doi:10.1126/sciadv.aba0721.

Walter, A., Caputi, L., O'Connor, S., van Pée, K.-H., & Ludwig-Müller, J.* (2020). Chlorinated auxins–how does *Arabidopsis thaliana* deal with them? *International Journal of Molecular Sciences, 21*(7): 2567. doi:10.3390/ijms21072567.

Dugé de Bergonville, T., Papon, N., Clastre, M., O'Connor, S. E.*, & Courdavault, V.* (2020). Identifying missing biosynthesis enzymes of plant natural products. *Trends in Pharmacological Sciences, 41*(3), 142-146. doi:10.1016/j.tips.2019.12.006.

Palmer, L., & O'Connor, S. E.* (2020). Virus-induced gene silencing in Nepeta. In V. Courdavault, & S. Besseau (Eds.), *Virus-Induced Gene Silencing in Plants* (pp. 111-121). Luxemburg: Springer Science+Business Media. doi:10.1007/978-1-0716-0751-0_9.

Carqueijeiro, I., Langley, C., Grzech, D., Koudounas, K., Papon, N., O'Connor, S. E.*, & Courdavault, V.* (2020). Beyond the semi-synthetic artemisinin: metabolic engineering of plant-derived anti-cancer drugs. *Current Opinion in Biotechnology, 65*, 17-24. doi:10.1016/j.copbio.2019.11.017.

Caputi, L., Franke, J., Bussey, K., Farrow, S. C., Curcino Vieira, I. J., Stevenson, C. E. M., Lawson, D. M.*, & O'Connor, S. E.* (2020). Structural basis of cycloaddition in biosynthesis of iboga and *Aspidosperma* alkaloids. *Nature Chemical Biology, 16*, 383-386. doi:10.1038/s41589-019-0460-x.

2019

Yamamoto, K., Takahashi, K., Caputi, L., Mizuno, H., Rodriguez-Lopez, C. E., Iwasaki, T., Ishizaki, K., Fukaki, H., Ohnishi, M., Yamazaki, M., Masujima, T., O'Connor, S. E., & Mimura, T.* (2019). The complexity of intercellular localisation of alkaloids revealed by single-cell metabolomics. *New Phytologist, 224*(2), 848-859. doi:10.1111/nph.16138.

Lichman, B. R., O'Connor, S. E., & Kries, H.* (2019). Biocatalytic strategies towards [4+2] cycloadditions. *Chemistry – A European Journal, 25*(28), 6864-6877. doi:10.1002/chem.201805412.

Lichman, B. R., Kamileen, M. O., Titchiner, G. R., Saalbach, G., Stevenson, C. E. M., Lawson, D. M., & O'Connor, S. E.* (2019). Uncoupled activation and cyclization in catmint reductive terpenoid biosynthesis. *Nature Chemical Biology, 15*, 71-79. doi:10.1038/s41589-018-0185-2.

Farrow, S. C., Kamileen, M. O., Caputi, L., Bussey, K., Mundy, J. E. A., McAtee, R. C., Stephenson, C. R. J., & O'Connor, S. E.* (2019). Biosynthesis of an anti-addiction agent from the iboga plant. *Journal of the American Chemical Society, 141*(33), 12979-12983. doi:10.1021/jacs.9b05999.

Franke, J., Kim, J., Hamilton, J. P., Zhao, D., Pham, G. M., Wiegert-Rininger, K., Crisovan, E., Newton, L., Vaillancourt, B., Tatsis, E., Buell, C. R.*, & O'Connor, S. E.* (2019). Gene discovery in *Gelsemium* highlights conserved gene clusters in monoterpene indole alkaloid biosynthesis. *Chembiochem, 20*(1), 83-87. doi:10.1002/cbic.201800592.

Johnson, S. R., Bhat, W. W., Bibik, J., Turmo, A., Hamberger, B., Mint Evolutionary Genomics Consortium, & Hamberger, B. (2019). A database-driven approach identifies additional diterpene synthase activities in the mint family (Lamiaceae). *The Journal of Biological Chemistry, 294*(4), 1349-1362. doi:10.1074/jbc.RA118.006025.

2018

Stavrinides, A. K., Tatsis, E. C., Dang, T.-T., Caputi, L., Stevenson, C. E. M., Lawson, D. M., Schneider, B., & O'Connor, S. E.* (2018). Discovery of a short-chain dehydrogenase from *Catharanthus roseus* that produces a new monoterpene indole alkaloid. *Chembiochem, 19*(9), 940-948. doi:10.1002/cbic.201700621.

Carqueijeiro, I., Dugé de Bernonville, T., Lanoue, A., Dang, T.-T., Teijaro, C., Paetz, C., Billet, K., Mosquera, A., Oudin, A., Besseau, S., Papon, N., Glévarec, G., Atehortùa, L., Clastre, M., Giglioli-Guivarc'h, N., Schneider, B., St-Pierre, B., Andrade, R. B., O'Connor, S. E., & Courdavault, V.* (2018). A BAHD acyltransferase catalyzing 19-O-acetylation of tabersonine derivatives in roots of *Catharanthus roseus* enables combinatorial synthesis of monoterpene indole alkaloids. *The Plant Journal, 49*(3), 469-484. doi:10.1111/tpj.13868.

Mint Evolutionary Genomics Consortium (2018). Phylogenomic mining of the mints: elucidating evolution in a chemically diverse clade. *Molecular Plant, 11*(8), 1084-1096. doi:10.1016/j.molp.2018.06.002.

Dang, T.-T.-T., Franke, J., Carqueijeiro, I. S. T., Langley, C., Courdavault, V., & O'Connor, S. E.* (2018). Sarpagan bridge enzyme has substrate-controlled cyclization and aromatization modes. *Nature Chemical Biology, 14*(8), 760-763. doi:10.1038/s41589-018-0078-4.

Casini, A., Chang, F.-Y., Eluere, R., King, A. M., Young, E. M., Dudley, Q. M., Karim, A., Pratt, K., Bristol, C., Forget, A., Ghodasara, A., Warden-Rothman, R., Gan, R., Cristofaro, A., Borujeni, A. E., Ryu, M.-H., Li, J., Kwon, Y.-C., Wang, H., Tatsis, E., Rodriguez-Lopez, C., O'Connor, S. E., Medema, M. H., Fischbach, M. A., Jewett, M. C., Voigt, C.*, & Gordon, D. B.* (2018). A pressure test to make 10 molecules in 90 days: external evaluation of methods to engineer biology. *Journal of the American Chemical Society, 140*(12), 4302-4316. doi:10.1021/jacs.7b13292.

Carqueijeiro, I., Brown, S., Chung, K., Dang, T.-T., Walia, M., Besseau, S., Dugé de Bernonville, T., Oudin, A., Lanoue, A., Billet, K., Munsch, T., Koudounas, K., Melin, C., Godon, C., Razafimandimby, B., de Craene, J.-O., Glévarec, G., Marc, J., Giglioli-Guivarc'h, N., Clastre, M., St-Pierre, B., Papon, N., Andrade, R. B., O'Connor, S. E.*, & Courdavault, V.* (2018). Two tabersonine 6,7-epoxidases start synthesis of lochnericine-type alkaloids in *Catharanthus roseus*. *Plant Physiology, 177*(4), 1473-1486. doi:10.1104/pp.18.00549.

Carqueijeiro, I., Sepúlveda, L. J., Mosquera, A., Payne, R., Corbin, C., Papon, N., Dugé de Bernonville, T., Besseau, S., Lanoue, A., Glévarec, G., Clastre, M., St-Pierre, B., Atehortùa, L., Giglioli-Guivarc'h, N., O'Connor, S. E., Oudin, A., & Courdavault, V.* (2018). Vacuole-targeted proteins: ins and outs of subcellular localization studies. In C. Pereira (Ed.), *Plant Vacuolar Trafficking* (pp. 33-54). New York City: Humania Press. doi:10.1007/978-1-4939-7856-4_4.

Caputi, L., Franke, J., Farrow, S. C., Chung, K., Payne, R. M. E., Nguyen, T.-D., Dang, T.-T.-T., Carqueijeiro, I. S. T., Koudounas, K., Dugé de Bernonville, T., Ameyaw, B., Jones, D. M., Vieira, I. J. C., Courdavault, V.*, & O'Connor, S. E.* (2018). Missing enzymes in the biosynthesis of the anticancer drug vinblastine in Madagascar periwinkle. *Science, 360*(6394), 1235-1238. doi:10.1126/science.aat4100.

Farrow, S. C., Kamileen, M. O., Meades, J., Ameyaw, B., Xiao, Y., & O'Connor, S. E.* (2018). Cytochrome P450 and O-methyltransferase catalyze the final steps in the biosynthesis of the anti-addictive alkaloid ibogaine from *Tabernanthe iboga*. *The Journal of Biological Chemistry, 293*(36), 13821-13833. doi:10.1074/jbc.RA118.004060.

Sherden, N. H., Lichman, B., Caputi, L., Zhao, D., Kamileen, M. O., Buell, C. R., & O'Connor, S. E.* (2018). Identification of iridoid synthases from Nepeta species: Iridoid cyclization does not determine nepetalactone stereochemistry. *Phytochemistry, 145*, 48-56. doi:10.1016/j.phytochem.2017.10.004.

2017

O'Connor, S. E.* (2017). Raising the BAR of specificity. *Nature Plants, 3*, 924-925. doi:10.1038/s41477-017-0074-9.

Tatsis, E. C., Carqueijeiro, I., Dugé de Bernonville, T., Franke, J., Dang, T.-T.-T., Oudin, A., Lanoue, A., Lafontaine, F., Stavrinides, A. K., Clastre, M., Courdavault, V.*, & O'Connor, S. E.* (2017). A three enzyme system to generate the *Strychnos* alkaloid scaffold from a central biosynthetic intermediate. *Nature Communications, 8*: 316. doi:10.1038/s41467-017-00154-x.

Kries, H., Kellner, F., Kamileen, M. O., & O'Connor, S. E.* (2017). Inverted stereocontrol of iridoid synthase in snapdragon. *The Journal of Biological Chemistry, 292*(35), 14659-14667. doi:10.1074/jbc.M117.800979.

Patallo, E. P., Walter, A., Milbredt, D., Thomas, M., Neumann, M., Caputi, L., O'Connor, S. E., Ludwog-Müller, J., & van Pée, K.-H.* (2017). Strategies to produce chlorinated indole-3-acetic acid and indole-3-acetic acid intermediates. *ChemistrySelect, 2*(34), 11148-11153. doi:10.1002/slct.201701933.

Larsen, B., Fuller, V. L., Pollier, J., Moerkercke, A. V., Schweizer, F., Payne, R., Colinas, M., O'Connor, S. E., Goossens, A., & Halkier, B. A.* (2017). Identification of iridoid glucoside transporters in *Catharanthus roseus*. *Plant and Cell Physiology, 58*(9), 1507-1518. doi:10.1093/pcp/pcx097.

Payne, R. M. E., Xu, D., Foureau, E., Carqueijeiro, M. I. S. T., Oudin, A., Dugé de Bernonville, T. , Novak, V., Burow, M., Olsen, C.-E., Jones, D. M., Tatsis, E. C., Pendle, A., Halkier, B. A., Geu-Flores, F., Courdavault, V., Nour-Eldin, H. H., & O'Connor, S. E.* (2017). An NPF transporter exports a central monoterpene indole alkaloid intermediate from the vacuole. *Nature, 3*: 16208. doi:10.1038/nplants.2016.208.

Dang, T.-T.-T., Franke, J., Tatsis, E., & O'Connor, S. E.* (2017). Dual catalytic activity of a cytochrome P450 controls bifurcation at a metabolic branch point of alkaloid biosynthesis in *Rauwolfia serpentina*. *Angewandte Chemie International Edition, 56*(32), 9440-9444. doi:10.1002/anie.201705010.

Leisner, C. P.*, Kamileen, M. O., Conway, M. E., O'Connor, S. E., & Buell, C. R. (2017). Differential iridoid production as revealed by a diversity panel of 84 cultivated and wild blueberry species. *PLoS One, 12*(6): e0179417. doi:10.1371/journal.pone.0179417.

Dugé de Bergonville, T., Carqueijeiro, I., Lanoue, A., Lafontaine, F., Bel, P. S., Liesecke, F., Musset, K., Oudin, A., Glevarec, G., Pichon, O., Besseau, S., Clastre, M., St-Pierre, B., Flors, V., Maury, S., Huguet, E., O'Connor, S. E., & Courdavault, V.* (2017). Folivory elicits a strong defense reaction in *Catharanthus roseus*: metabolomic and transcriptomic analyses reveal distinct local and systemic responses. *Scientific Reports, 7*: 40453. doi:10.1038/srep40453.

2016

O'Connor, S. E.* (2016). *Synthetic biology and metabolic engineering in plants and microbes. Part B. Metabolism in plants*.

O'Connor, S. E.* (2016). *Synthetic biology and metabolic engineering in plants and microbes. Part A: Metabolism in microbes*.

Kries, H., Caputi, L., Stevenson, C. E. M., Kamileen, M. O., Sherden, N. H., Geu-Flores, F., Lawson, D. M., & O'Connor, S. E.* (2016). Structural determinants of reductive terpene cyclization in iridoid biosynthesis. *Nature Chemical Biology, 12*(1), 6-8. doi: 10.1038/nchembio.1955.

Stavrinides, A., Tatsis, E. C., Caputi, L., Foureau, E., Stevenson, C. E. M., Lawson, D. M., Courdavault, V.*, & O'Connor, S. E.* (2016). Structural investigation of heteroyohimbine alkaloid synthesis reveals active site elements that control stereoselectivity. *Nature Communications, 7*: 12116. doi:10.1038/ncomms12116.

Tatsis, E. C., & O'Connor, S. E.* (2016). New developments in engineering plant metabolic pathways. *Current Opinion in Biotechnology, 42*, 126-132. doi:10.1016/j.copbio.2016.04.012.

Kries, H., & O'Connor, S. E.* (2016). Biocatalysts from alkaloid producing plants. *Current Opinion in Chemical Biology, 31*, 22-30. doi:10.1016/j.cbpa.2015.12.006.

Parage, C., Foureau, E., Kellner, F., Burlat, V., Mahroug, S., Lanoue, A., Dugé de Bergonville, T., Arias Londono, M., Carqueijeiro, I., Oudin, A., Besseau, S., Papon, N., Glevarec, G., Atehortua, L., Giglioli-Guivarc'h, N., St-Pierre, B., Clastre, M., O'Connor, S. E.*, & Courdavault, V.* (2016). Class II cytochrome P450 reductase governs the biosynthesis of alkaloids. *Plant Physiology, 172*(3), 1563-1577. doi:10.1104/pp.16.00801.

Jakubczyk, D., Caputi, L., Stevenson, C. E. M., Lawson, D. M., & O'Connor, S. E.* (2016). Structural characterization of EasH (*Aspergillus japonicus*) - an oxidase involved in cycloclavine biosynthesis. *Chemical Communications, 52*(99), 14306-14309. doi:10.1039/c6cc08438a.

Alagna, F.*, Geu-Flores, F., Kries, H., Panara, F., Baldoni, L., O'Connor, S. E., & Osbourn, A. (2016). Identification and characterization of the iridoid synthase involved in oleuropein biosynthesis in olive (*Olea europaea*) fruits. *The Journal of Biological Chemistry, 291*(11), 5542-5554. doi:10.1074/jbc.M115.701276.

2015

O'Connor, S. E.* (2015). Engineering of secondary metabolism. In *Annual Review of Genetics* (pp. 71-94). Palo Alto, Calif.: Annual Reviews, Inc.

Van Moerkercke, A., Steensma, P., Schweizer, D., Pollier, J., Gariboldi, I., Payne, A., Bossche, R. V., Miettinen, K., Espoz, J., Purnama, P. C., Kellner, F., Seppänen-Laakso, T., O'Connor, S. E., Rischer, H., Memelink, J., & Goossens, A.* (2015). The bHLH transcription factor BIS1 controls the iridoid branch of the monoterpenoid indole alkaloid pathway in *Catharanthus roseus*. *Proceedings of the National Academy of Sciences of the United States of America, 112*(26), 8130-8135. doi:10.1073/pnas.1504951112.

Munkert, J., Pollier, J., Miettinen, K., Van Moerkercke, A., Payne, R., Mueller-Uri, F., Burlat, V., O'Connor, S. E., Memelink, J., Kreis, W.*, & Goossens, A.* (2015). Iridoid synthase activity is common among the plant progesterone 5β-reductase family. *Molecular Plant, 8*(1), 136-152. doi:10.1016/j.molp.2014.11.005.

Brown, S., & O'Connor, S. E.* (2015). Halogenase engineering for the generation of new natural product analogues. *Chembiochem, 16*(15), 2129-2135. doi:10.1002/cbic.201500338.

Stavrinides, A., Tatsis, E. C., Foureau, E., Caputi, L., Kellner, F., Courdavault, V.*, & O'Connor, S. E.* (2015). Unlocking the diversity of alkaloids in *Catharanthus roseus*: nuclear localization suggests metabolic channeling in secondary metabolism. *Chemistry & Biology, 22*(3), 336-341. doi:10.1016/j.chembiol.2015.02.006.

Patron, N.*, Orzaez, D., Marillonnet, S., Warzecha, H., Matthewman, C., Youles, M., Raitskin, O., Leveau, A., Farre, G., Rogers, C., Smith, A., Hibberd, J., Webb, A. A. R., Locke, J., Schornack, S., Ajioka, J., Baulcombe, D. C., Zipfel, C., Kamoun, S., Jones, J. D. G., Kuhn, H., Robatzek, S., Van Esse, H. P., Sanders, D., Oldroyd, G., Martin, C., Field, R., O'Connor, S. E., Fox, S., Wulff, B., Miller, B., Breakspear, A., Radhakrishnan, G., Delaux, P.-M., Loque, D., Granell, A., Tissier, A., Shih, P., Brutnell, T. P., Quick, W. P., Rischer, H., Fraser, P. D., Aharoni, A., Raines, C., South, P. F., Ane, J.-M., Hamberger, B. R., Langdale, J., Stougaard, J., Bouwmeester, H., Udvardi, M., Murray, J. A. H., Ntoukakis, V., Schaefer, P., Denby, K., Edwards, K. J., Osbourn, A., & Haseloff, J. (2015). Standards for plant synthetic biology: a common syntax for exchange of DNA parts. *New Phytologist, 208*(1), 13-19. doi:10.1111/nph.13532.

Kellner, F., Geu-Flores, F., Sherden, N. H., Brown, S., Foureau, E., Courdavault, V., & O'Connor, S. E.* (2015). Discovery of a P450-catalyzed step in vindoline biosynthesis: a link between the *Aspidosperma* and eburnamine alkaloids. *Chemical Communications, 51*(36), 7626-7628. doi:10.1039/c5cc01309g.

Jakubczyk, D., Caputi, L., Hatsch, A., Nielsen, C. A. F., Diefenbacher, M., Klein, J., Molt, A., Schroeder, H., Cheng, J. Z., Naesby, M.*, & O'Connor, S. E.* (2015). Discovery and reconstitution of the cycloclavine biosynthetic pathway—enzymatic formation of a cyclopropyl group. *Angewandte Chemie International Edition, 54*(17), 5117-5121. doi:10.1002/anie.201410002.

Brown, S., Clastre, M., Courdavault, V.*, & O'Connor, S. E.* (2015). De novo production of the plant-derived alkaloid strictosidine in yeast. *Proceedings of the National Academy of Sciences of the United States of America, 112*(11), 3205-3210. doi:10.1073/pnas.1423555112.

Kellner, F., Kim, J., Clavijo, B. J., Hamilton, J. P., Childs, K. L., Vaillancourt, B., Cepela, J., Habermann, M., Steuernagel, B., Clissold, L., McLay, K., Buell, C. R.*, & O'Connor, S. E.* (2015). Genome-guided investigation of plant natural product biosynthesis. *The Plant Journal, 82*(4), 680-692. doi:10.1111/tpj.12827.

Dugé de Bergonville, T., Foureau, E., Parage, C., Lanoue, A., Clastre, M., Londono, M. A., Oudin, A., Houille, B., Papon, N., Besseau, S., Glevarec, G., Atehortua, L., Giglioli-Guivarc'h, N., St-Pierre, B., De Luca, V., O'Connor, S. E., & Courdavault, V.* (2015). Characterization of a second secologanin synthase isoform producing both secologanin and secoxyloganin allows enhanced de novo assembly of a *Catharanthus roseus* transcriptome. *BMC Genomics, 16*: 619. doi:10.1186/s12864-015-1678-y.

Jakubczyk, D., & O'Connor, S. E.* (2015). Ergot alkaloids. In *Privileged Scaffolds in Medicinal Chemistry: Design, Synthesis, Evaluation* (pp. 379-397).

2014

Nielsen, C. A. F., Folly, C., Hatsch, A., Molt, A., Schroeder, H., O'Connor, S. E., & Naesby, M.* (2014). The important ergot alkaloid intermediate chanoclavine-I produced in the yeast *Saccharomyces cerevisiae* by the combined action of EasC and EasE from *Aspergillus japonicus*. *Microbial Cell Factories, 13*: 95. doi:10.1186/s12934-014-0095-2.

Lindner, S., Geu-Flores, F., Braese, S., Sherden, N. H.*, & O'Connor, S. E.* (2014). Conversion of substrate analogs suggests a Michael cyclization in iridoid biosynthesis. *Chemistry & Biology, 21*(11), 1452-1456. doi:10.1016/j.chembiol.2014.09.010.

O'Connor, S. E., & Brutnell, T. P.* (2014). Editorial overview: Growing the future: synthetic biology in plants. *Current Opinion in Plant Biology, 19*, IV-V. doi:10.1016/j.pbi.2014.05.005.

Jakubczyk, D., Cheng, J. Z., & O'Connor, S. E.* (2014). Biosynthesis of the ergot alkaloids. *Natural Product Reports, 31*(10), 1328-1338. doi:10.1039/c4np00062e.

2013

O'Connor, S. E.*, & Gibbons, S. (2013). Editorial: Modern methods in plant natural products themed issue. *Natural Product Reports, 30*(4), 483-484. doi:10.1039/c3np90008h.

Glenn, W. S., Runguphan, W., & O'Connor, S. E.* (2013). Recent progress in the metabolic engineering of alkaloids in plant systems. *Current Opinion in Biotechnology, 24*(2), 354-365. doi:10.1016/j.copbio.2012.08.003.

Runguphan, W., & O'Connor, S. E.* (2013). Diversification of monoterpene indole alkaloid analogs through cross-coupling. *Organic Letters, 15*(11), 2850-2853. doi:10.1021/ol401179k.

Besseau, S., Kellner, F., Lanoue, A., Thamm, A. M., Salim, V., Schneider, B., Geu-Flores, F., Höfer, R., Guirimand, G., Guihur, A., Oudin, A., Glevarec, G., Foureau, E., Papon, N., Clastre, M., Giglioli-Guivarc'h, N., St-Pierre, B., Werck-Reichhart, D., Burlat, V., Luca, V. D., O'Connor, S. E., & Courdavault, V.* (2013). A pair of tabersonine 16-hydroxylases initiates the synthesis of vindoline in an organ dependent manner in *Catharanthus roseus*. *Plant Physiology, 163*(4), 1792-1803. doi:10.1104/pp.113.222828.

2012

O'Connor, S. E.* (2012). Strategies for engineering plant natural products: the iridoid-derived monoterpene indole alkaloids of *Catharanthus roseus*. In D. A. Hopwood (Ed.), *Natural Product Biosynthesis by Microorganisms and Plant* (Pt A, pp. 189-206). San Diego: Academic Press Inc.

O'Connor, S. E.* (2012). Alkaloids. In N. Civjan (Ed.), *Natural Products in Chemical Biology Biosynthesis of Natural Products* (pp. 209-237). Hoboken, New Jersey, Vereinigte Staaten: John Wiley & Sons, Inc.

Ruff, B. M., Braese, S., & O'Connor, S. E.* (2012). Biocatalytic production of tetrahydroisoquinolines. *Tetrahedron Letters, 53*(9), 1071-1074. doi:10.1016/j.tetlet.2011.12.089.

Gongora-Castillo, E., Childs, K. L., Fedewa, G., Hamilton, J. P., Liscombe, D. K., Magallanes-Lundback, M., Mandadi, K. K., Nims, E., Runguphan, W., Vaillancourt, B., Varbanova-Herde, M., DellaPenna, D., McKnight, T. D., O'Connor, S. E., & Buell, C. R.* (2012). Development of transcriptomic resources for interrogating the biosynthesis of monoterpene indole alkaloids in medicinal plant species. *PLoS One, 7*(12): e52506. doi:10.1371/journal.pone.0052506.

DellaPenna, D., & O'Connor, S. E.* (2012). Plant gene clusters and opiates. *Science, 336*(6089), 1648-1649. doi:10.1126/science.1225473.

Panjikar, S.*, Stoeckigt, J., O'Connor, S. E., & Warzecha, H. (2012). The impact of structural biology on alkaloid biosynthesis research. *Natural Product Reports, 29*(10), 1176-1200. doi:10.1039/c2np20057k.

Geu-Flores, F., Sherden, N. H., Courdavault, V., Burlat, V., Glenn, W. S., Wu, C., Nims, E., Cui, Y., & O'Connor, S. E.* (2012). An alternative route to cyclic terpenes by reductive cyclization in iridoid biosynthesis. *Nature, 492*(7427), 138-142. doi:10.1038/nature11692.

Runguphan, W., Glenn, W. S., & O'Connor, S. E.* (2012). Redesign of a dioxygenase in morphine biosynthesis. *Chemistry & Biology, 19*(6), 674-678. doi:10.1016/j.chembiol.2012.04.017.

2011

Giddings, L.-A., Liscombe, D. K., Hamilton, J. P., Childs, K. L., DellaPenna, D., Buell, C. R., & O'Connor, S. E.* (2011). A stereoselective hydroxylation step of alkaloid biosynthesis by a unique cytochrome P450 in *Catharanthus roseus*. *The Journal of Biological Chemistry, 286*(19), 16751-16757. doi:10.1074/jbc.M111.225383.

Liscombe, D. K., & O'Connor, S. E.* (2011). A virus-induced gene silencing approach to understanding alkaloid metabolism in *Catharanthus roseus*. *Phytochemistry, 72*(16), 1969-1977. doi:10.1016/j.phytochem.2011.07.001.

Hicks, M. A., Barber II, A. E., Giddings, L.-A., Caldwell, J., O'Connor, S. E., & Babbitt, P. C.* (2011). The evolution of function in strictosidine synthase-like proteins. *Proteins: Structure, Function, and Bioinformatics, 79*(11), 3082-3098. doi:10.1002/prot.23135.

Glenn, W. S., Nims, E., & O'Connor, S. E.* (2011). Reengineering a tryptophan halogenase to preferentially chlorinate a direct alkaloid precursor. *Journal of the American Chemical Society, 133*(48), 19346-19349. doi:10.1021/ja2089348.

Goetz, K. E., Coyle, C. M., Cheng, J. Z., O'Connor, S. E., & Panaccione, D. G.* (2011). Ergot cluster-encoded catalase is required for synthesis of chanoclavine-I in *Aspergillus fumigatus*. *Current Genetics, 57*(3), 201-211. doi:10.1007/s00294-011-0336-4.

2010

Liscombe, D. K., Usera, A. R., & O'Connor, S. E.* (2010). Homolog of tocopherol C methyltransferases catalyzes N methylation in anticancer alkaloid biosynthesis. *Proceedings of the National Academy of Sciences of the United States of America, 107*(44), 18793-18798. doi:10.1073/pnas.1009003107.

Cheng, J. Z., Coyle, C. M., Panaccione, D. G., & O'Connor, S. E.* (2010). Controlling a structural branch point in ergot alkaloid biosynthesis. *Journal of the American Chemical Society, 132*(37), 12835-12837. doi:10.1021/ja105785p.

Bernhardt, P., Usera, A. R., & O'Connor, S. E.* (2010). Biocatalytic asymmetric formation of tetrahydro-beta-carbolines. *Tetrahedron Letters, 51*(33), 4400-4402. doi:10.1016/j.tetlet.2010.06.075.

Cheng, J. Z., Coyle, C. M., Panaccione, D. G.*, & O'Connor, S. E.* (2010). A role for old yellow enzyme in ergot alkaloid biosynthesis. *The Journal of Physical Chemistry B, 132*(6), 1776-1777. doi:10.1021/ja910193p.

Coyle, C. M., Cheng, J. Z., O'Connor, S. E., & Panaccione, D. G.* (2010). An old yellow enzyme gene controls the branch point between *Aspergillus fumigatus* and *Claviceps purpurea* ergot alkaloid pathways. *Applied and Environmental Microbiology, 76*(12), 3898-3903. doi:10.1128/AEM.02914-09.

O'Connor, S. E.* (2010). Alkaloids. In H.-W. Ling (Ed.), *Comprehensive Natural Products II: Chemistry and Biology* (pp. 977-1007). Amsterdam: Elsevier.

Runguphan, W., Qu, X., & O'Connor, S. E.* (2010). Integrating carbon-halogen bond formation into medicinal plant metabolism. *Nature, 468*, 461-464. doi:10.1038/nature09524.

2009

Runguphan, W., Maresh, J. J., & O'Connor, S. E.* (2009). Silencing of tryptamine biosynthesis for production of nonnatural alkaloids in plant culture. *Proceedings of the National Academy of Sciences of the United States of America, 106*(33), 13673-13678. doi:10.1073/pnas.0903393106.

O'Connor, S. E.* (2009). Methods for Molecular Identification of Biosynthetic Enzymes in Plants. In *Plant-derived Natural Products* (pp. 165-179). New York, NY: Springer. doi:10.1007/978-0-387-85498-4_7.

Bernhardt, P., Yerkes, N., & O'Connor, S. E.* (2009). Bypassing stereoselectivity in the early steps of alkaloid biosynthesis. *Organic & Biomolecular Chemistry, 7*(20), 4166-4168. doi:10.1039/b916027m.

Runguphan, W., & O'Connor, S. E.* (2009). Metabolic reprogramming of periwinkle plant culture. *Nature Chemical Biology, 5*(3), 151-153. doi:10.1038/nchembio.141.

Lee, H.-Y., Yerkes, N., & O'Connor, S. E.* (2009). Aza-tryptamine substrates in monoterpene indole alkaloid biosynthesis. *Chemistry & Biology, 16*(12), 1225-1229. doi:10.1016/j.chembiol.2009.11.016.

Friedrich, A., Brase, S., & O'Connor, S. E.* (2009). Synthesis of 4-, 5-, 6-, and 7-azidotryptamines. *Tetrahedron Letters, 50*(1), 75-76. doi:10.1016/j.tetlet.2008.10.091.

Bernhardt, P., & O'Connor, S. E.* (2009). Synthesis and biochemical evaluation of des-vinyl secologanin aglycones with alternate stereochemistry. *Tetrahedron Letters, 50*(51), 7118-7120. doi:10.1016/j.tetlet.2009.09.171.

Leonard, E., Runguphan, W., O'Connor, S. E., & Prather, K. J.* (2009). Opportunities in metabolic engineering to facilitate scalable alkaloid production. *Nature Chemical Biology, 5*(5), 292-300. doi:10.1038/nchembio.160.

Usera, A. R., & O'Connor, S. E.* (2009). Mechanistic advances in plant natural product enzymes. *Current Opinion in Chemical Biology, 13*(4), 492-498. doi:10.1016/j.cbpa.2009.06.019.

Bernhardt, P., & O'Connor, S. E.* (2009). Opportunities for enzyme engineering in natural product biosynthesis. *Current Opinion in Chemical Biology, 13*(1), 35-42. doi:10.1016/j.cbpa.2009.01.005.

2008

Maresh, J. J., Giddings, L.-A., Friedrich, A., Loris, E. A., Panjikar, S., Trout, B. L., Stöckigt, J., Peters, B., & O'Connor, S. E.* (2008). Strictosidine synthase: Mechanism of a Pictet-Spengler catalyzing enzyme. *Journal of the American Chemical Society, 130*(2), 710-723. doi:10.1021/ja077190z.

O'Connor, S. E.* (2008). *Alkaloid Biosynthesis*. doi:10.1002/9780470048672.

McCoy, E., & O'Connor, S. E.* (2008). Natural products from plant cell cultures. In F. Petersen, & R. Amstutz (Eds.), *Natural Compounds as Drugs, Vol. 1* (pp. 331-370). Basel – Boston – Berlin: Birkhäuser Verlag AG. doi:10.1007/978-3-7643-8117-2_9.

Yerkes, N., Wu, J. X., McCoy, E., Galan, M. C., Chen, S., & O'Connor, S. E.* (2008). Substrate specificity and diastereoselectivity of strictosidine glucosidase, a key enzyme in monoterpene indole alkaloid biosynthesis. *Bioorganic & Medicinal Chemistry Letters, 18*(10), 3095-3098. doi:10.1016/j.bmcl.2007.11.063.

2007

Bernhardt, P., McCoy, E., & O'Connor, S. E.* (2007). Rapid identification of enzyme variants for reengineered alkaloid biosynthesis in periwinkle. *Chemistry & Biology, 14*(8), 888-897. doi:10.1016/j.chembiol.2007.07.008.

Galan, M. C., McCoy, E., & O'Connor, S. E.* (2007). Chemoselective derivatization of alkaloids in periwinkle. *Chemical Communications, 21*(31), 3249-3251. doi:10.1039/b708919h.

2006

O'Connor, S. E.*, & Maresha, J. J. (2006). Chemistry and biology of monoterpene indole alkaloid biosynthesis. *Natural Product Reports, 23*(4), 532-547. doi:10.1039/b512615k.

O'Connor, S. E.*, & McCoy, E. (2006). Chapter one - Terpene indole alkaloid biosynthesis. *Recent Advances in Phytochemistry, 40*, 1-22. doi:10.1016/S0079-9920(06)80035-3.

O'Connor, S. E.* (2006). Cyclization of natural products. *Nature Chemical Biology, 2*(10), 511-512. doi:10.1038/nchembio1006-511.

Chen, S., Galan, M. C., Coltharp, C., & O'Connor, S. E.* (2006). Redesign of a central enzyme in alkaloid biosynthesis. *Chemistry & Biology, 13*(11), 1137-1141. doi:10.1016/j.chembiol.2006.10.009.

McCoy, E., & O'Connor, S. E.* (2006). Directed biosynthesis of alkaloid analogs in the medicinal plant *Catharanthus roseus*. *Journal of the American Chemical Society, 128*(44), 14276-14277. doi:10.1021/ja066787w.

McCoy, E., Galan, M. C., & O'Connor, S. E.* (2006). Substrate specificity of strictosidine synthase. *Bioorganic & Medicinal Chemistry Letters, 16*(9), 2475-2478. doi:10.1016/j.bmcl.2006.01.098.

Galan, M. C., & O'Connor, S. E.* (2006). Semi-synthesis of secologanin analogues. *Tetrahedron Letters, 47*(10), 1563-1565. doi:10.1016/j.tetlet.2006.01.009.

2005

Vaillancourt, F. H., Yeh, E., Vosburg, D. A., O'Connor, S. E., & Walsh, C. T.* (2005). Cryptic chlorination by a non-haem iron enzyme during cyclopropyl amino acid biosynthesis. *Nature, 436*, 1191-1194. doi:10.1038/nature03797.

2004

Hicks, L. M., O'Connor, S. E., Mazur, M. T., Walsh, C. T., & Kelleher, N. L.* (2004). Mass spectrometric interrogation of thioester-bound intermediates in the initial stages of epothilone biosynthesis. *Chemistry & Biology, 11*(3), 327-335. doi:10.1016/j.chembiol.2004.02.021.

O'Connor, S. E.* (2004). Aureolic acids: Similar antibiotics with different biosynthetic gene clusters. *Chemistry & Biology, 11*(1), 8-10. doi:10.1016/j.chembiol.2004.01.006.

Couch, R., O'Connor, S. E., Seidle, H., Walsh, C. T., & Parry, R.* (2004). Characterization of CmaA, an adenylation-thiolation didomain enzyme involved in the biosynthesis of coronatine. *Journal of Bacteriology, 186*(1), 35-42. doi:10.1128/JB.186.1.35-42.2004.

2003

O'Connor, S. E., Walsh, C. T.*, & Liu, F. (2003). Biosynthesis of epothilone intermediates with alternate starter units: engineering polyketide-nonribosomal interfaces. *Angewandte Chemie International Edition, 42*(33), 3917-3921. doi:10.1002/anie.200352077.

Walsh, C. T.*, O'Connor, S. E., & Schneider, T. L. (2003). Polyketide-nonribosomal peptide epothilone antitumor agents: the EpoA, B, C subunits. *Journal of Industrial Microbiology & Biotechnology, 30*(8), 448-455. doi:10.1007/s10295-003-0044-2.

2002

Schneider, T. L., Walsh, C. T.*, & O'Connor, S. E. (2002). Utilization of alternate substrates by the first three modules of the epothilone synthetase assembly line. *Journal of the American Chemical Society, 124*(38), 11272-3-11273. doi:10.1021/ja0274498.

O'Connor, S. E., Chen, H., & Walsh, C. T.* (2002). Enzymatic assembly of epothilones: the EpoC subunit and reconstitution of the EpoA-ACP/B/C polyketide and nonribosomal peptide interfaces. *Biochemistry, 41*(17), 5685-5694. doi:10.1021/bi020006w.

Chen, H., Hubbard, B. K., O'Connor, S. E., & Walsh, C. T.* (2002). Formation of beta-hydroxy histidine in the biosynthesis of nikkomycin antibiotics. *Chemistry & Biology, 9*(1), 103-112. doi:10.1016/s1074-5521(02)00090-x.

2001

Chen, H., O'Connor, S. E., Cane, D. E., & Walsh, C. T.* (2001). Epothilone biosynthesis: assembly of the methylthiazolylcarboxy starter unit on the EpoB subunit. *Chemistry & Biology, 8*(9), 899-912. doi:10.1016/s1074-5521(01)00064-3.

O'Connor, S. E., Pohlmann, J., Imperiali, B.*, Saskiawan, I., & Yamamoto, K. (2001). Probing the effect of the outer saccharide residues of N-linked glycans on peptide conformation. *Journal of the American Chemical Society, 123*(25), 6187-6188. doi:10.1021/ja010094s.

Chen, H., Thomas, M. G., O'Connor, S. E., Hubbard, B. K., Burkart, M. D., & Walsh, C. T.* (2001). Aminoacyl-S-enzyme intermediates in beta-hydroxylations and alpha,beta-desaturations of amino acids in peptide antibiotics. *Biochemistry, 40*(39), 11651-11659. doi:10.1021/bi0115434.

1999

Imperiali, B.*, O'Connor, S. E., Hendrickson, T., & Kellenberger, C. (1999). Chemistry and biology of asparagine-linked glycosylation. *Pure and Applied Chemistry, 71*(5), 777-787. doi:10.1351/pac199971050777.

Imperiali, B.*, & O'Connor, S. E. (1999). Effect of N-linked glycosylation on glycopeptide and glycoprotein structure. *Current Opinion in Chemical Biology, 3*(6), 643-649. doi:10.1016/S1367-5931(99)00021-6.

1998

O'Connor, S. E., & Imperiali, B.* (1998). A molecular basis for glycosylation-induced conformational switching. *Chemistry & Biology, 5*(8), 427-437. doi:10.1016/S1074-5521(98)90159-4.

Imperiali, B.*, & O'Connor, S. E. (1998). The conformational basis of asparagine-linked glycosylation. *Pure and Applied Chemistry, 70*(1), 33-40. doi:10.1351/pac199870010033.

1997

O'Connor, S. E., & Imperiali, B.* (1997). Conformational switching by asparagine-linked glycosylation. *Journal of the American Chemical Society, 119*(9), 2295-2296. doi:10.1021/ja963435o.

1996

O'Connor, S. E., & Imperiali, B.* (1996). Modulation of protein structure and function by asparagine-linked glycosylation. *Chemistry & Biology, 3*(10), 803-812. doi:10.1016/S1074-5521(96)90064-2.

Patents

Boccia, M., O'Connor, S. E., & Sonawane, P. D. (2024). *Use of utteroside B and derivates as pesticide for agriculture, food, cosmetics and pharma - Patent Application Nr.: MI 1602-6783-LI-JH*.

O'Connor, S. E., Caputi, L., & Payne, R. E. (2018). *Method (PAS/DPAS) - Patent Application Nr.: GB1804289.5 - United Kingdom Patent*.

O'Connor, S. E., & Lichman, B. R. (2018). *Method (NEPS) - Patent Application Nr.: GB1808663.7 - United Kingdom Patent*.