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Education

2001 PhD, Organic Chemistry, Massachusetts Institute of Technology, Cambridge, MA

1995 BS, Chemistry, University of Chicago, Chicago, IL

Posts held

2011-present	Project Leader, The John Innes Centre, Department of Biological Chemistry, Norwich, UK
2011-present	The University of East Anglia, School of Chemistry, Norwich, UK (Honorary Professor (2015-present), 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

2017	Elected to EMBO membership
2013	Wain Medal
2011	Royal Society Wolfson Research Merit Award
2011	ACS Pfizer Award in Enzyme Chemistry
2007-2009	Sloan Research Fellowship
2007	Arthur Neisch Young Investigator Award of the North American Phytochemical Society
2007-2010	American Cancer Society Research Scholar
2005-2008	Beckman Young Investigator
2004-2007	Latham Family Career Development Professor
2003-2005	Smith Family Medical Foundation New Investigator
2000-2002	American Chemical Society Irving S. Sigal Postdoctoral Fellowship, Harvard Medical School
1998-1999	American Chemical Society Organic Division Graduate Fellowship, California Institute of Technology
1998	Distinguished Graduate Student Everhart Lecture Series, California Institute of Technology

External Panels and Committees

Member, Industrial Biotechnology and Bioenergy Strategy Advisory Panel (BBSRC) (2016-present)

External Advisory Board, Helmholtz Foundation, Karlsruhe Institute of Technology (2015-present)

Member, Newton Foundation Fellowship Committee (2015-2021)

Advisory Board, Terpnet (2015-present)

Advisory Board, Alkion (2013-present)

Member, BBSRC Panel D (2013-2016)

ad hoc Member, BBSRC Panel B (2016)

Chair of the Plant Metabolic Gordon Research Conference (2015)

Review Panel for Helmholtz Foundation (2014)

Associate Editor ACS Synthetic Biology (2017- present)

Editorial Board Metabolic Engineering (2016- present)

Editorial Advisory Board Phytochemistry (2015-present)

Editorial Advisory Board RSC ChemBioChem (2015-present)

Editorial Advisory Board ACS Chemical Advances (2015-present)

Editorial Advisory Board Natural Products Reports (2011-present)

Editorial Advisory Board ACS Chemical Biology (2012-present)
 Editorial Advisory Board ACS Synthetic Biology (2012-present)
 Member of the Scientific Advisory Board of Alkion (2011-present)
 Organizing Committee for European Conference on Natural Products (2013)
 Organizing Committee for Banff (2012)

Internal Panels and Committees

Chair of the Faculty (2017-present)
 Academic Lead for Mass Spectrometry (Line manager for Lionel Hill, Paul Brett and Gerhard Saalbach) (2015-present)
 Chair of Student Recruiting Committee (2017-present)
 Chair of SIFT Committee (2016-present)
 Member of Finance Committee (2016-2017)
 Member of Scientific Resources Committee (2016-2017)
 Member of Annual Science Meeting Committee (2015-2016)
 Performance Review Panel (2014-2016)

Research Funding

Current Support

ERC Advanced Grant (O'Connor, PI)	07/18-07/23
ERC 788301	€2,499,000
Harnessing the Molecules of Medicinal Plants	
BBSRC (O'Connor, PI)	02/16-02/19
BB/N007905/1	£600,000
Unlocking the Chemical Diversity of Plant Natural Product Pathways: Dehydrogenases in Alkaloid Biosynthesis	

NSF Genome Grant (Buell, PI; Dudavera, O'Connor, Soltis, Soltis, co-PIs)	04/15-04/20
NSF 1444499	\$1,200,000
Evolution Of Specialized Metabolite Biosynthetic Pathways In The Lamiaceae: Sources Of Chemical Diversity For Molecules Essential For Human Health, And Plant Fitness	

Past Support

ERA-1B	09/14-09/17
(van Pee, PI: O'Connor, Goss, Judwig, Pollmann, Lachlan, co-PIs)	
7th EU Framework Programme	€461,000 (€1,539,000 total for consortium)
Production of New Bioactive Compounds by Plants and Bacteria using New and Improved Halogenases	

ERC Starting Grant (Consolidator) (O'Connor, PI)	02/13-02/18
ERC	€1,497,920
Synthetic Metabolism in Plants: Elucidating Vinblastine Biosynthesis and Implementing Strategies to Overproduce Complex Plant Metabolites	

BB/J018171/1 (O'Connor, PI)	09/13-09/16
BBSRC	£477,627
Redox Enzymes Required for Construction of the Ergot Alkaloid Framework	

EP/J012947/1(O'Connor, PI)	12/12-12/15
EPSRC	£454,536
Generation of Alkaloid Structural Diversity Using Biocatalysts	

BB/J009091/1 (O'Connor, PI)	08/12-08/15
BBSRC	£478,866
Towards Plant Synthetic Biology: Elucidating the Novel Enzymology of Iridoid Biosynthesis	

RO1-GM074820-04 (O'Connor, PI)	04/07-02/13
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NIH	\$1,466,142	
Early Steps in Alkaloid Biosynthesis		
1RC2GM092521 (Chappell, U. KY, Program Director; Della Penna, MSU; O'Connor, MIT co-Program Directors)		
		09/09-09/12
NIH	\$595,681	
Advancing Drug Development in Medicinal Plants Using Transcriptomics and Metabolomics		
RO1-GM074820-03S1 (O'Connor, PI)		07/09-06/10
NIH	\$106,458	
Early Steps in Alkaloid Biosynthesis		
RSG-07-025-01 (O'Connor, PI)		01/07-12/10
American Cancer Society	\$720,000	
Production of Vinblastine Analogues in Madagascar Periwinkle		
MCB-0719120 (O'Connor, PI)		10/07-09/10
NSF	\$445,856	
Combinatorial Biosynthesis of New Alkaloids in Periwinkle		
(O'Connor, PI)		12/03-11/05
Smith Family Foundation	\$200,000	
Human Biosynthesis of Alkaloids		

Selected Invited/Plenary Lectures

- ERC Synthetic Biology Session, Toulouse, France, 07/18
- Mosbacher Kolloquium, Synthetic Biology, Mosbach, Germany, 03/18
- Keystone Symposia on Natural Products and Synthetic Biology, Olympia Valley, USA, 01/18
- Brazilian Conference on Natural Products, Vittoria, Brazil, 11/17
- Botanikertagung, German Botanical Society, Kiel University, Germany, 09/17
- Secondary Metabolite Conference 2017 (JBEI), Walnut Creek, USA, 07/17
- Tetrahedron Symposium in Organic Chemistry, Hungary, 07/17
- Synthetic Biology: Engineering, Evolution & Design Meeting, Vancouver, CA, 06/17
- UPenn Biophysics Seminar Series, USA, 04/17
- MiCom Workshop, Jena, 03/17
- Workshop on Plant Synthetic Biology, Lausanne, 03/17
- Irseer Naturstofftage 2017, Irsee, Germany, 02/17
- Copenhagen Plant Science Centre, University of Copenhagen, Denmark, 09/16
- Gordon Research Conference on Heterocyclic Compounds, Newport, USA, 06/16
- 15th Annual Life Sciences Institute Symposium, University of Michigan, Ann Arbor, USA, 05/16
- University of Chicago, Department of Chemistry, 04/16
- ASBMB, San Diego, USA, 04/16
- Gordon Conference on Marine Natural Products, Ventura, USA, 03/16
- Annual Symposium on Biological Complexity, Salk Institute, La Jolla, USA, 01/16
- University of Basel, Department of Chemistry, Basel, Switzerland, 12/15
- Leibniz Plant Biochemistry Symposium 2015, Halle, Germany, 09/15
- Elliott Lecture, Rothamsted Research, Harpendon, UK, 06/15
- ISACS 16, Challenges in Chemical Biology, Zurich, 06/15
- Terpnet, Vancouver, Canada, 6/15
- Directing Biosynthesis, Norwich, UK, 03/15
- HIPS Talk, Helmholtz-Institute for Pharmaceutical Research, Saarland, Germany, 01/15
- Synthetic Pathways and Synthetic Enzyme Cascades, Frankfurt, Germany, 01/15

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 Stavrinides (Diploma Montpellier)
2012-2015	Franziska Kellner (Diploma University of Applied Sciences Dresden)
2018-2022	Dagny Grzech (BS University of East Anglia)
2018-2022	Chloe Langley (BS University of Leicester)
2018-2022	Lira Palmer (BS University of California Irvine)
2019-2013	Mohamed Omar Kamileen (BS University of East Anglia)

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	Thuy Dang (PhD Calgary)
2016-2018	Benjy Lichman (PhD UCL)
2015-2018	Jakob Franke (PhD Leibnitz, Jena)
2016-2018	Don Nguyen (PhD Calgary)
2016-present	Scott Farrow (PhD Calgary)
2017-present	Kotaro Yamamoto (PhD Kobe)
2017-present	Carlos Carlos Rodríguez-López
2013-present	Lorenzo Caputi, RA/lab manager (PhD University of York)
2018-present	Matt Demars (PhD University of Michigan)
2019-present	Nestor Hernandez (PhD University of Wisconsin)

MS and Project Students

2012	Greg Mann (MChem, UEA)
2013	Chris Delaforce (MChem, UEA)
2014	Sarah Hayes (MChem, UEA)
2015	Omar Kamileen (BS BIO, UEA)
2016	Jessica Meade (BS BIO, UEA)
2017	Dagny Grzech (BS BIO, UEA)

Visiting Students

2008-2009	Anne Friedrich (PhD student Universitat Karlsruhe)
2010-2011	Bettina Ruff (PhD student Universitat Karlsruhe)
2013	Stephanie Lindner (PhD student Universitat Karlsruhe)
2016	Chloe Langley (BS Leicester)
2016-2017	Katy David (BS York)
2016-present	Dagny Grzech (BS UEA)
2017	Belinda Ameyaw (BS Lancaster)

2017	Gabriel Titchiner (BS Keele)
2017-2018	Miu Iijima (JSPS Research Fellow University of Toyama)
2017-2019	Fen Li (Rothamsted)
2017-2019	Shang Wang (Rothamsted)

Courses Taught**University of East Anglia****BIO-6019Y Plant Biotechnology** (10 enrollment)

Taught S16, S17

This module will identify the major challenges for sustainable crop production, highlight the role of plant biotechnology and current plant breeding strategies. Taught two lectures each year on medicinal plants.

CHE-2FY8 Medicinal Chemistry (100 enrollment)

Taught S12, F12, F13-S14 (module organizer F13-S14)

This course introduces medicinal chemistry using chemical principles established during the first year. Topics discussed include the mode of action and synthesis of β -lactams; sulphonamides, amino acids and proteins and their significance in medicinal chemistry; biosynthesis and properties of alkaloids such as manzamine; the mode of action of enzymes and chemotherapy discussed in the context of bacterial and viral infections.

CHE-3H16 Medicinal Chemistry (40 enrollment)

Taught S13

This course introduces medicinal chemistry using chemical principles established during the first year. Topics discussed include the mode of action and synthesis of β -lactams; sulphonamides, amino acids and proteins and their significance in medicinal chemistry; biosynthesis and properties of alkaloids such as manzamine; the mode of action of enzymes and chemotherapy discussed in the context of bacterial and viral infections.

MIT**5.12 Organic Chemistry I** (110-160 enrollment in Fall; 280-300 enrollment in Spring)

Taught S05, F05, S07, F07, F08, F09

This is an introductory organic chemistry course for undergraduates at MIT. Acidity, Alkanes, Stereochemistry, Alkyl Halides, Nucleophilic Substitution and Elimination, Chemistry of Alkenes and Alkynes, Electrophilic Aromatic Substitution, Alcohols, Aldehydes and Ketones, Carboxylic Acids and Derivatives, and Enol/Enolate Chemistry are covered during this course.

5.451 Chemistry of Biomolecules (20-30 enrollment)

Taught F03, F04, F05, F07

This graduate class is designed to teach entering organic and biological chemistry graduate students modern chemical biology, bioengineering and reaction/enzyme mechanism within the context of natural product biosynthesis.

5.54/7.540/20.554 Frontiers in Chemical Biology (20 enrollment)

Taught F08, F09

Developed with Professor B. Imperiali in Fall of 2008. The syllabus is designed to provide an introduction to current research at the interface of chemistry, biology, and bioengineering.

Chemistry Tutorial (5-10 enrollment)

Taught F03, F04

This intense, 3-week graduate class is designed to teach incoming organic graduate students how to work through organic mechanism problems.

Publications

- Lichman, B. R., Kamileen, M. O., Titchiner, G. R., Saalbach, G., Stevenson, C. E. M., Lawson, D. M., O'Connor, S. E. Uncoupled activation and cyclisation in catmint reductive terpenoid biosynthesis. *Nat. Chem. Biol.* *accepted*
- Franke, J., Kim, J., Hamilton, J. P., Zhao, D., Pham, G. M., Wiegert-Rininger, K., Crisovan, E., Newton, L., Vaillancourt, B., Tatsis, E. C., Buell, C. R., O'Connor, S. E. (2018) Conserved gene clusters in monoterpene indole alkaloid biosynthesis enable gene discovery in *Gelsemium sempervirens*. *ChemBioChem* (VIP paper) doi: 10.1002/cbic.201800592
- 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*. *J. Biol. Chem.* 293, 13821-13833.
- Carqueijeiro, I., Brown, S., Chung, K., Dang, T. T. T., 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., Atehortúa, L., Clastre, M., Giglioli-Guivarc'h, N., St Pierre, B., Andrade, R., O'Connor, S., Courdavault, V. (2018) Two tabersonine 6,7-epoxidases start synthesis of lochnericine-type alkaloids in *Catharanthus roseus*. *Plant Physiol.* 177, 1473-1486.
- Carqueijeiro, I., Sepúlveda, L. J., Mosquera, A., Payne, R., Corbin, C., Papon, N., de Bernonville, T. D., Besseau, S., Lanoue, A., Glévarec, G., Clastre, M., St-Pierre, B., Atehortúa, L., Giglioli-Guivarc'h, N., O'Connor, S. E., Oudin, A., Courdavault, V. (2018) Vacuole-Targeted Proteins: Ins and Outs of Subcellular Localization Studies. *Methods Mol. Biol.* 1789, 33-54.
- The Mint Consortium. (2018) Phylogenomic mining of the mints: elucidating evolution in a chemically diverse clade. *Mol. Plant.* 11, 1084-1096.
- Dang, T. T. T., Franke, J., Carqueijeiro, I., Langley, C., Courdavault, V., O'Connor, S. E. (2018) Cyclization vs. aromatization: The substrate-guided double face of cytochrome P450 homologues provides entry into both sarpagan and β -carboline alkaloids. *Nat. Chem. Biol.* 14, 760-763.
- 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, 1235-1239.
- Casini, A., Chang, F.-Y., Eluere, R., King, A., Young, E., Dudley, Q., Karim, A., Pratt, K., Bristol, C., Forget, A., Ghodasara, A., Warden-Rothman, R., Gan, R., Cristofaro, A., Espah Borujeni, A., Ryu, M.-H., Li, J., Kwon, Y., Wang, H., Tatsis, E., Rodriguez-Lopez, C., O'Connor, S., Medema, M., Fischbach, M., Jewett, M., Voigt, C., Gordon, D. B. (2018) A Pressure Test to Make 10 Molecules in 90 Days: External Evaluation of Methods to Engineer Biology. *J. Am. Chem. Soc.* 140, 4302-4316.
- 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., Atehortúa, L., Clastre, M., Giglioli-Guivarc'h, N., Schneider, B., St Pierre, B., Andrade, R., O'Connor, S., Courdavault, V. (2018) A novel BAHD acyltransferase catalyzing 19-O-acetylation of tabersonine derivatives in roots of *Catharanthus roseus* enables combinatorial synthesis of new-to-nature monoterpene indole alkaloids. *Plant J.* 94, 469-484
- Stavrínides, 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 novel monoterpene indole alkaloid. *ChemBioChem.* (VIP paper). 19, 940-948.
- 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.

- Patallo, E. P., Walter, A., Milbredt, D., Thomas, M., Neumann, M., Caputi, L., O'Connor, S., Ludwig-Müller, J., van Pée, K.-H. (2017) Strategies to Produce Chlorinated Indole-3-Acetic Acid and Indole-3-Acetic Acid Intermediates. *ChemistrySelect*. 2, 11148-11153.
- Kries, H., Franziska Kellner, F. Kamileen, M.O., O'Connor, S.E. (2017) Inverted stereocontrol of iridoid synthase in snapdragon. *J. Biol. Chem.* 292, 14659-14667
- 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*. *Angew. Chem. Intl. Ed.* 56, 9440-9444.
- Larsen, B., Fuller, V.L., Pollier, J., Van Moerkercke, A., Schweizer, F., Payne, R.E.M., O'Connor, S.E., Goossens, A., Halkier, B.A. (2017) Identification of iridoid glucoside transporters in *Catharanthus roseus*. *Plant Cell Physiol.* 58, 1507-1518.
- Tatsis, E.C., Carqueijeiro, M.I.S.T., Courdavault, V., O'Connor, S.E. (2017) A three enzyme system to generate the Strychnos alkaloid scaffold from a central biosynthetic intermediate. *Nat. Commun.* 8, 316.
- Leisner C. P., Conway M. E., Buell, C. R., Kamileen Mohamed. O., O'Connor, S. E. (2017) Differential iridoid production as revealed a diversity panel of 84 cultivated and wild blueberry species. *PloS One*. 12, e0179417.
- Dugé de Bernonville, T., Carqueijeiro, I., Lanoue, A., Lafontaine, F., Sánchez Bel, .P, Liesecke, F., Musset, K., Oudin, A., Glévarec, 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. *Sci. Rep.* 7, 40453.
- Payne, R.M.E., Xu, D., Foureau, E., Soares Teto Carqueijeiro, M. I., 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 Plants*. 3, 16208.
- Jakubczyk, D., Caputi, L., Stevenson, C.E., Lawson, D.M., O'Connor, S.E. (2016) Structural characterization of EasH (*Aspergillus japonicus*) - an oxidase involved in cycloclavine biosynthesis. *Chem. Comm.* 52, 14306-14309.
- Jakubczyk, D., O'Connor, S. (2016) Ergot alkaloids. *RSC Drug Discovery Series*. 50, 379-397.
- Parage, C., Foureau, E., Kellner, F., Burlat, V., Mahroug, S., Lanoue, A., Dugé de Bernonville, T., Londono, M.A., Carqueijeiro, I., Oudin, A., Besseau, S., Papon, N., Glévarec, G., Atehortúa, 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 Physiol.* 172, 1563-1577.
- Tatsis, E.C., O'Connor, S.E. (2016) New developments in engineering plant metabolic pathways. *Curr. Opin. Biotech.* 42, 126-132.
- Stavrínides, 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. *Nat. Commun.* 12116.
- Kries, H., Caputi, L., Stevenson, C.E., 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. *Nat. Chem. Biol.* 12, 6-8.

- Kries, H., O'Connor, S.E. (2016) Biocatalysts from alkaloid producing plants. *Curr. Opin. Chem. Biol.* 31, 22-30.
- Alagna, F., Geu-Flores, F., Kries, H., Panara, F., Baldoni, L., O'Connor, S.E., Osbourn, A. (2015) Identification and characterization of the iridoid synthase involved in oleuropein biosynthesis in Olive (*Olea europaea*) Fruits. *J. Biol. Chem.* 29, 5542-5545.
- Brown S, O'Connor S. (2015) Halogenase engineering for the generation of novel natural products. *Chembiochem* 6, 2129-2135.
- O'Connor, S. E. (2015) Metabolic engineering of secondary metabolism. *Ann. Rev. Gen.* 49, 71-94.
- Dugé de Bernonville, T., Foureau, E., Parage, C., Lanoue, A., Clastre, M., Londono, M.A., Oudin, A., Houillé, B., Papon, N., Besseau, S., Glévarec, G., Atehortúa, 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.
- Patron, N. J.,...O'Connor, S.,...Haseloff, J. (2015) Standards for plant synthetic biology: a common syntax for exchange of DNA parts. *New Phytol.* 208, 13-19.
- Van Moerkercke, A., Steensma, P., Schweizer, F., Pollier, J., Gariboldi, I., Payne, R., Vanden Bossche, R., 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*. *Proc. Natl. Acad. Sci. USA* 112, 8130-8135.
- Kellner, F., Geu-Flores, F., Sherden, N. H., Brown, S., Courdavault, V., O'Connor, S. E. (2015) Discovery of a P450-catalyzed step in vindoline biosynthesis: a link between the aspidosperma and eburnamine alkaloids. *Chem. Commun.* 51, 7626-7628.
- Kellner, F., Kim, J., Clavijo, B. J., Hamilton, J. P., Childs, K. L., Vaillancourt, B., Cepela, J., Steuernagel, B., Clissold, L., McLay, K., Buell, C. R., O'Connor, S. E. (2015) Genome biology elucidation of plant natural product biosynthesis. *Plant J.* 82, 680-692.
- Brown, S., Clastre, M., Courdavault, V. O'Connor, S.E. (2015) De novo production of the plant-derived alkaloid strictosidine in yeast. *Proc. Natl. Acad. Sci. USA* 112, 3205-3210.
- Jakubczyk, D., Caputi, L., Hatsch, A., Nielsen, C. A. F., Diefenbacher, M., Klein, J., Molt, A., Schröder, 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. *Angew. Chem. Int. Ed. Engl.* 54, 5117-5121.
- Stavrínides A, Tatsís EC, Foureau E, Caputi L, Kellner F, Courdavault V, O'Connor SE. (2015) Unlocking the diversity of alkaloids in *Catharanthus roseus*: nuclear localization suggests metabolic channeling in secondary metabolism. *Chem. Biol.* 19, 336-341.
- Munkert, J., Pollier, J., Miettinen, K., Van Moerkercke, A., Payne, R., Müller-Uri, F., Burlat, V., O'Connor, S.E., Memelink, J., Kreis, W., Goossens, A. (2015) Iridoid synthase activity is common among the plant progesterone 5 β -reductase family. *Mol. Plant* 8, 136-152.
- Lindner, S., Geu-Flores, F., Bräse, S., Sherden, N. H., O'Connor, S. E. (2014) Conversion of substrate analogs suggests a Michael cyclization in iridoid biosynthesis. *Chem. Biol.* 21, 1452-1456.
- O'Connor, S. E, Brutnell, T. P. (2014) Growing the future: synthetic biology in plants. *Curr. Opin. Plant Biol.* 19, iv-v.

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