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| **Nationality:** British  **ORCiD ID:** 0002-5941-2806  **ResearcherID:** N-3805-2014 | School of Chemistry  University Park  Nottingham  NG7 2RD, UK | **Contact Details:**  +44 (0)7940 419391  ellis.oneill@nottingham.ac.uk |

# Education and Research Experience:

**Assistant Professor (School of Chemistry) – University of Nottingham, 2022 – present**

**Nottingham Research Fellow (School of Chemistry) – University of Nottingham, 2019 – 2022**

**Themes:** Natural product chemistry, algal biochemistry, secondary metabolite biosynthesis, Euglena biology

**Glasstone Independent Research Fellow (Department of Plant Sciences) and Junior Research Fellow (New College) – University of Oxford, 2016-2019.**

**Themes:** Synthetic biology of Euglena, natural product identification, specialised metabolite biosynthesis, biochemistry.

**Postdoctoral Research Assistant – Department of Plant Sciences, University of Oxford, 2015-2016.**

**Themes:** Synthetic biology, natural product biosynthesis, plant pathogens, crop improvement, genetic engineering (Steve Kelly).

**Postdoctoral Scholar – Scripps Institution of Oceanography, University of California – San Diego,2014-2015**.

**Themes:** Natural product biosynthesis, microbiology, genome mining, small molecule purification, heterologous expression, genetic engineering. (Brad Moore).

**PhD – John Innes Centre, University of East Anglia,2009-2013**.

Thesis: *“An exploration of phosphorylases for the synthesis of carbohydrate polymers.”* (Rob Field)

**Themes:** Biomolecular engineering, carbohydrate active enzymes, protein crystallography, analytical chemistry, transcriptomics, biotransformation.

**MA – Natural Sciences, University of Cambridge, 2006-2009.**

**Themes:** Plant and microbial sciences, synthetic biology, RNA engineering, gene silencing, algal transformation

Undergraduate project: *Exploring the use of a riboswitch to control gene expression of the viral silencing suppressor protein p19.* (David Baulcombe).

# Funding:

Nottingham Research Fellowship (~£255,000)

Glasstone Independent Research Fellowship (~£170,000)

Royal Society Research Grant (£20,000)

Royal Society of Chemistry Research Enablement Grant (10,000)

Other small supporting grants (~£10,000 total)

# Teaching and Supervisory Experience:

Fellowship of the HEA

PGCHE modules Curriculum Design and Assessment in Higher Education, Developing Learning and Teaching, and Biological Sciences Graduate Teacher Training Course

Full range of responsibilities as a Lecturer/Assistant Professor including:

Undergraduate lecturing and examining (biochemistry, molecular biology etc in Molecules of Life (1st Year Nottingham MSci), Evolution of mitochondria and chloroplasts (3rd year Oxford BSc))

Laboratory demonstrating (organic chemistry, biochemistry)

Tutoring (organic chemistry, biochemistry, molecular biology, plant sciences)

Supervising Undergraduate research projects

Completed “Leadership in Action” management training, MPLS division, University of Oxford

Graduate student supervision (2 full project students, 4 rotation students)

Graduate student progress examiner

Thesis examining (Macquarie University)

Graduate student interviewing

# Other Responsibilities:

Vice President of the Euglena International Network

Organising Committee/Session Chair of the British Phycological Society Annual Meeting (Jan 2021)

Chair of the Oxford Congress on Plant Sciences 2018 Organising Committee

Member of the Biochemical Society Early Career Advisory Panel

Grant reviewer for BBSRC, Human Frontier Science Program

Reviewing manuscripts for *Carbohydrate Research*, *BMC Genomics*, *Algal Research* etc.

# Selected Oral Presentations:

Festival of Algae – Birmingham, Nov 2021

ESBOC meeting – New Frontiers in Chemistry & Biology – May 2021, Online

British Phycological Society Annual Meeting – Session Chair (Applied Phycology), Jan 2021, Online

Euglena International Network Annual Meeting – Nov 2020, Online

Natural Products in Drug Discovery and Human Health – Lisbon, Portugal, July 2019

RSC Carbohydrate Group Conference – University of Reading, April 2019

Indian Society of Chemists and Biologist silver jubilee symposium – Invited Lecturer, Lucknow, India, Jan 2019

Exploring Kenyan Biodiversity: Chemistry, Pharmacology and Commercialization – GRVL, Kenya, Sept 2017

The Chemistry and Biology of Natural Products Symposium XI – Warwick, June 2017

Algal Polysaccharides – Edinburgh, UK, Aug 2016

Oxford Congress on Plant Sciences – Oxford, July 2016

HVCfP Synthetic Biology Workshop – Norwich, UK, July 2015

# Society Affiliations:

Member of the Royal Society of Chemistry (since 2009)

Member of the Biochemical Society (since 2009)

# Publications:

Ebenezer, T. E., Low, R. S., **O’Neill, E.C.**, Huang, I., DeSimone, A., Farrow, S. C., Field, R. A., Ginger, M., Guerrero, S. A., Hammond, M., Hampl, V., Horst, G., Ishikawa, T., Karnkowska, A., Linton, E.W., Myler, P., Nakazawa, M., Cardol, P., Sánchez-Thomas, R., Saville, B.J., Shah, M. R., Simpson, A.G. B., Sur A., Suzuki, K., Tyler, K.M., Zimba, P., Hall, N., and Field, M. C. *OSF Preprints* (2022). Euglena International Network (EIN): Driving euglenoids into the biotechnology world. DOI: 10.31219/osf.io/j9b4f

**O’Neill, E.C.#** Glycosylated proteins identified for the first time in the alga *Euglena gracilis* bioRxiv (2021) DOI: 2021.10.28.466288

30. Aldholmi, M., Ahmad, R., Carretero-Molina, D., Pérez-Victoria, I., Martín, J., Reyes, F., Genilloud, O., Gourbeyre, L., Gefflaut, T., Carlsson, H., Maklakov, A., **O'Neill, E.C.** Field, R.A., Wilkinson, B., O'Connell, M. and Ganesan, A. Euglenatides, potent antiproliferative cyclic peptides isolated from the freshwater photosynthetic microalga Euglena gracilis. *Angewandte Chemie International Edition* (2022) DOI: 10.1002/anie.202203175

29. Schorn, M.A., Verhoeven, S., Ridder, L., Huber, F., Acharya, D.D., Aksenov, A.A., Aleti, G., Moghaddam, J.A., Aron, A.T., Aziz, S., Bauermeister, A., Bauman, K.D., Baunach, M., Beemelmanns, C., Beman, J.M., Berlanga-Clavero, M.V., Blacutt, A.A., Bode, H.B., Boullie, A., Brejnrod, A., Bugni, T.S., Calteau, A., Cao, L., Carrión, V.J., Castelo-Branco, R., Chanana, S., Chase, A.B., Chevrette, M.G., Costa-Lotufo, L.V., Crawford, J.M., Currie, C.R., Cuypers, B., Dang, T., De Rond, T., Demko, A.M., Dittmann, E., Du, C., Drozd, C., Dujardin, J.-C., Dutton, R.J., Edlund, A., Fewer, D.P., Garg, N., Gauglitz, J.M., Gentry, E.C., Gerwick, L., Glukhov, E., Gross, H., Gugger, M., Guillén Matus, D.G., Helfrich, E.J.N., Hempel, B.-F., Hur, J.-S., Iorio, M., Jensen, P.R., Kang, K.B., Kaysser, L., Kelleher, N.L., Kim, C.S., Kim, K.H., Koester, I., König, G.M., Leao, T., Lee, S.R., Lee, Y.-Y., Li, X., Little, J.C., Maloney, K.N., Männle, D., Martin H., C., Mcavoy, A.C., Metcalf, W.W., Mohimani, H., Molina-Santiago, C., Moore, B.S., Mullowney, M.W., Muskat, M., Nothias, L.-F., **O’Neill, E.C.**, Parkinson, E.I., Petras, D., Piel, J., Pierce, E.C., Pires, K., Reher, R., Romero, D., Roper, M.C., Rust, M., Saad, H., Saenz, C., Sanchez, L.M., Sørensen, S.J., Sosio, M., Süssmuth, R.D., Sweeney, D., Tahlan, K., Thomson, R.J., Tobias, N.J., Trindade-Silva, A.E., Van Wezel, G.P., Wang, M., Weldon, K.C., Zhang, F., Ziemert, N., Duncan, K.R., Crüsemann, M., Rogers, S., Dorrestein, P.C., Medema, M.H., Van Der Hooft, J.J.J. A community resource for paired genomic and metabolomic data mining. *Nature Chemical Biology* (2021) 17, 4, 363-368 DOI:10.1038/s41589-020-00724-z

28. **O’Neill, E.C.#** *Handbook of Algal Science, Technology and Medicine* (Ozcan Konur ed.) (2020) Chapter 10 - Using new techniques to study old favorites: A case study of Euglena 161-170 DOI: 10.1016/B978-0-12-818305-2.00010-3

27. **O'Neill, E.C.#**Mining natural product biosynthesis in eukaryotic algae. *Marine Drugs* (2020) 18, 90 DOI: 10.3390/md18020090

26. Inwongwan, S., Kruger, N.J., Ratcliffe, R.G. and **O’Neill, E.C.#** Euglena central metabolic pathways and their subcellular locations. *Metabolites* (2019) 9, 115 DOI: 10.3390/metabo9060115

25. **O’Neill, E.C.#**, Schorn, M., Larson, C. B. and Millán-Aguiñaga, N. Targeted antibiotic discovery through biosynthesis-associated resistance determinants: target directed genome mining. *Critical reviews in microbiology* (2019) 45, 255-277 DOI: 10.1080/1040841X.2019.1590307

24. Ebenezer, T.E., Zoltner, M., Burrell, A., Nenarokova, A., Novák Vanclová, A.M.G., Prasad, B., Soukal, P., Santana-Molina, C., **O’Neill, E.C.**, Nankissoor, N. N., Vadakedath N., Daiker, V., Obado, S., Silva-Pereira, S., Jackson A.P., Devos, D.P., Lukeš, J., Lebert, M., Sue Vaughan, S., Hampl, V., Carrington, M., Ginger, M.L., Dacks, J.B., Kelly, S. and Field, M.C. Transcriptome, proteome and draft genome of *Euglena gracilis. BMC Biology* (2019) 17, 11 DOI: 10.1186/s12915-019-0626-8

23. Wagstaff, B.A., Hems, E.S., Rejzek, M., Pratscher, J., Brooks, E., Kuhaudomlarp, S., **O'Neill, E.C.**, Donaldson, M.I., Lane, S., Currie, J., Hindes, A.M., Malin, G., Murrell, J.C., and Field, R.A. (2018) Insights into toxic *Prymnesium parvum* blooms: the role of sugars and algal viruses. *Biochemical Society Transactions* (2018) 46, 413-421 DOI: 10.1042/BST20170393

22. **O’Neill, E.C.**#, Kuhaudomlarp, S., Rejzek, M., Fangel, J. U., Alagesan, K., Kolarich, D., Willats, W.G.T., and Field, R.A. Exploring the glycans of *Euglena gracilis*. *Biology* (2017) 6, 45 DOI: 10.3390/biology6040045

21. Kelly, S., Ivens, A., Mott, G.A., **O’Neill, E.C.,** Emms, D., Macleod, O., Voorheis, P., Tyler, K., Clark, M., Matthews, J., Matthews, K., Carrington, M.C. An alternative strategy for trypanosome survival in the mammalian bloodstream revealed through genome and transcriptome analysis of the ubiquitous bovine parasite *Trypanosoma (Megatrypanum) theileri*. *Genome Biology and Evolution* (2017) 9, 2093-2109 DOI: 10.1093/gbe/evx152

20. **O’Neill, E.C.**, Pergolizzi, G., Stevenson, C.E.M., Lawson, D.M., Nepogodiev, S.A., and Field, R.A. Cellodextrin phosphorylase from *Clostridium thermocellum*: X-ray crystal structure and substrate specificity analysis. *Carbohydrate Research* (2017) DOI: 10.1016/j.carres.2017.07.005

19. **O’Neill, E.C.**# and Kelly, S. Engineering biosynthesis of high-value compounds in photosynthetic organisms. *Critical Reviews in Biotechnology* (2017) 37, 779-802 DOI: 10.1080/07388551.2016.1237467

18. **O’Neill, E.C.**# Biomolecular engineering of micro-organisms for natural products production. In: Reedijk, J. (Ed.) Reference Module in Chemistry, Molecular Sciences and Chemical Engineering. Waltham, MA: Elsevier. 22-Apr-2017 DOI:10.1016/B978-0-12-409547-2.12791-X

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16. Ivanova, I.M., Nepogodiev, S.A., Saalbach, G., **O'Neill, E.C.**, Urbaniak, M.D., Ferguson, M.A.J., Gurcha, S.S., Besra, G.S., and Field R.A. Fluorescent mannosides serve as acceptor substrates for glycosyltransferase and sugar-1-phosphate transferase activities in Euglena gracilis membranes. *Carbohydrate Research* (2017) 438, 26-38 DOI: 10.1016/j.carres.2016.11.017

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14. **O'Neill, E.C.**#, Saalbach, G., and Field, R.A. Gene discovery for synthetic biology: exploring the novel natural product biosynthetic capacity of eukaryotic microalgae. *Methods in Enzymology* (2016) 576, 99-120 DOI: 10.1016/bs.mie.2016.03.005

13. **O’Neill, E.C.**, Stevenson, C.E.M., Tantanarat, K., Latousakis, D., Donaldson, M.I., Rejzek, M., Nepogodiev, S.A., Limpaseni, T., Field, R.A. and Lawson, D.M. Structural dissection of the maltodextrin disproportionation cycle of the *Arabidopsis* plastidial enzyme DPE1. *Journal of Biological Chemistry* (2015) 290, 29834 DOI: 10.1074/jbc.M115.682245

12. **O’Neill, E.C.**, Trick, M., Henrissat, B. and Field, R.A. Euglena in time: Evolution, control of central metabolic processes and multi-domain proteins in carbohydrate and natural product biochemistry. *Perspectives in Science* (2015) 6, 84-93 DOI: 10.1016/j.pisc.2015.07.002

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10. **O’Neill, E.C.,** and Field, R.A. Underpinning starch biology with in vitro studies on carbohydrate-active enzymes and biosynthetic glycomaterials*. Frontiers in Bioengineering and Biotechnology* (2015) 3, 136 DOI: 10.3389/fbioe.2015.00136

9. **O’Neill, E.C.,** Trick, M., Hill, L., Rejzek, M., Dusi, R.G., Hamilton, C.J., Zimba, P.V., Henrissat, B. and Field, R.A. The transcriptome of *Euglena gracilis* reveals unexpected metabolic capabilities for carbohydrate and natural product biochemistry. *Molecular Biosystems* (2015) 11, 2808-2820 DOI: 10.1039/C5MB00319A

8. **O’Neill, E.C.,**\* Stevenson, C.E.M.,\* Paterson, M.J., Rejzek, M., Chauvin, A.-L., Lawson, D.M., and Field, R.A. Crystal structure of a novel two domain GH78 family α-rhamnosidase from *Klebsiella oxytoca* with rhamnose bound. *Proteins: Structure, Function, and Bioinformatics* (2015) 83, 1742-1749 DOI: 10.1002/prot.24807

7. Wagstaff, B.A., Rejzek, M., Pesnot, T., Tedaldi, L.M., Caputi, L., **O’Neill, E.C.,** Benini, S., Wagner, G.K., and Field, R.A. Enzymatic synthesis of nucleobase-modified UDP-sugars: scope and limitations. *Carbohydrate Research* (2015) 404, 17-25 DOI: 10.1016/j.carres.2014.12.005

6. **O’Neill, E.C.,** and Field, R.A. Enzymatic synthesis using glycoside phosphorylases. *Carbohydrate Research* (2015) 403, 23-37 DOI: 10.1016/j.carres.2014.06.010

5. **O'Neill, E.C.,** Rashid, A.M., Stevenson, C.E.M., Hetru, A.-C., Gunning, A.P., Rejzek, M., Nepogodiev, S.A., Bornemann, S., Lawson, D.M., and Field, R.A. Sugar-coated sensor chip and nanoparticle surfaces for the in vitro enzymatic synthesis of starch-like materials. *Chemical Science* (2014) 5, 341-350 DOI: 10.1039/C3SC51829A

4. Tantanarat, K., **O’Neill, E.C.,** Rejzek, M., Field, R.A., and Limpaseni, T. Expression and characterization of 4-α-glucanotransferase genes from Manihot esculenta Crantz and Arabidopsis thaliana and their use for the production of cycloamyloses. *Process Biochemistry* (2014) 49, 84-89 DOI: 10.1016/j.procbio.2013.10.009

3. **O’Neill, E.C.,** and Field, R.A. Antibiotics: Blocking bacterial defences. *Nature Chemistry* (2013) 5, 642-643 DOI: 10.1038/nchem.1718

2. Caputi, L., Rejzek, M., Louveau, T., **O’Neill, E.C.,** Hill, L., Osbourn, A., and Field, R.A. A one-pot enzymatic approach to the O-fluoroglucoside of N-methylanthranilate. *Bioorganic and Medicinal Chemistry* (2013) 21, 4762-4767 DOI: 10.1016/j.bmc.2013.05.057

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\*Joint authorship

# Corresponding author