

## Ryan F. Seipke, PhD, FHEA

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### EMPLOYMENT

2013 - Present: Assistant Professor in the School of Molecular & Cellular Biology / Astbury Centre for Structural Molecular Biology at the University of Leeds  
2012 - 2013: NERC-funded Senior Research Associate at the University of East Anglia  
2009 - 2012: MRC-funded Senior Research Associate at the University of East Anglia  
2008 - 2009: USDA-funded Postdoctoral Fellow at Cornell University

### EDUCATION

2003 - 2008: PhD in Microbiology from Cornell University (Ithaca, NY USA)  
1999 - 2003: BA in Biology (*summa cum laude*) from Adrian College (Adrian, MI USA)

### FUNDING

2018-2019 **BBSRC NPRONET** (POC050). A standardised approach for identifying small molecule elicitors of secondary metabolism in actinomycetes (Co-I; PI = A. O'Neill, Leeds), £56,861 fEC  
2018-2019 **BBSRC NPRONET** (POC045). Understanding epistasis in industrial antibiotic-producing *Streptomyces* (Co-I; PI = P. Hoskisson, Strathclyde), £66,747 fEC  
2017-2020 **BBSRC** (BB/R000352/1). A multi-user flow cytometry facility for the biosciences in Leeds (Co-I; PI = E. Blair, Leeds), £235,263 fEC  
2017-2018 **BBSRC NPRONET** (POC038). Promiscuity is where it is AT: Exploiting a promiscuous acyltransferase for diversifying polyketide natural products (PI), £65,145 fEC  
2016-2019 **BBSRC** (BB/N007980/1). Elucidating novel regulatory mechanisms of antimycin-type depsipeptide biosynthesis (PI), £425,670 fEC  
2014-2015 **The Royal Society** (RG140011). Actinomycetes: From Genomes to Molecules (PI), £13,700  
2014-2015 **British Society for Antimicrobial Chemotherapy** (GA2014\_006P). Discovery of antimycotic agents active against invasive fungal pathogens (PI), £11,960  
2011-2012 **The John and Pamela Salter Charitable Trust** (R20243). Isolation of new antifungal agents to treat drug-resistant fungal infections (PI), £2,380  
2004-2006 **USDA** Multidisciplinary Graduate Education Traineeship. \$56,000  
2002 **NSF** Research Experience for Undergraduates Fellowship. \$3,000

### PUBLICATIONS

Google Scholar *h*-index = 17; i10-index = 21; citations = 1173

# = corresponding or co-corresponding author

30. Skyrud W, Liu J, Thankachan D, Cabrera M, **Seipke RF**<sup>#</sup>, Zhang W. 2018. Biosynthesis of the 15-membered ring depsipeptide neoantimycin. *ACS Chem Biol* 13:1398-1406
29. van der Heul H, Bilyk B, McDowall KJ, **Seipke RF**, van Wezel GP. 2018. Regulation of antibiotic production in Actinobacteria: perspectives from the post-genomic era. *Nat Prod Rep* 35:575-604
28. Holmes NA, Devine R, Qin Z, **Seipke RF**, Wilkinson B, Hutchings MI. 2018. Complete genome sequence of *Streptomyces formicae* KY5, the formicamycin producer. *J Biotechnol* 265:116-118
27. Joynt R, **Seipke RF**<sup>#</sup>. 2018. A phylogenetic and evolutionary analysis of antimycin biosynthesis. *Microbiology* 164:28-39

26. Nass NM, Farooque S, Hind C, Wwand M, Randall CP, Sutton JM, **Seipke RF**, Rayner CM, O'Neill AJ. 2017. Revisiting unexploited antibiotics in search of new antibacterial drug candidates: the case of  $\gamma$ -actinorhodin. *Sci Rep* 7:17419
25. Som NF, Heine D, Holmes N, Knowles F, Chandra G, **Seipke RF**, Hoskisson PA, Wilkinson B, Hutchings MI. 2017. The MtrAB two component system controls antibiotic production in *Streptomyces coelicolor* A3(2). *Microbiology* 163:1415-1419
24. Som NF, Heine D, Holmes NA, Munnoch JT, Chandra G, **Seipke RF**, Hoskisson PA, Wilkinson B, Hutchings MI. 2017. The conserved two-component system MtrAB coordinates chloramphenicol production with sporulation in *Streptomyces venezuelae*. *Front Microbiol* 8:1145
23. Zhiwei Q, Munnoch JT, Devine R, Holmes NA, **Seipke RF**, Wilkinson KA, Wilkinson B, Hutchings MI. 2017. Formicamycins, antibacterial polyketides produced by *Streptomyces formicae* isolated from African *Tetraponera* plant-ants. *Chemical Science* 8:3218-3227
22. McLean TC, Hoskisson PA, **Seipke RF**#. 2016. Coordinate regulation of antimycin and candicidin biosynthesis. *mSphere* 1:e00305-16
21. Medema MH, Kottmann R, Yilmaz P, Cummings M, Biggins JB, Blin K, de Bruijn I, [ . . . ] **Seipke RF**, [ . . . ] Breitling R, Takano E, Glöckner FO. 2015. Minimum information about a biosynthetic gene cluster. *Nat Chem Biol* 11:625-631
20. **Seipke RF**#. 2015. Strain-level diversity of secondary metabolism in *Streptomyces albus*. *PLoS One* 10:e0116457
19. Liu J, Zhu X, **Seipke RF**, Zhang W. 2015. Biosynthesis of antimycins with a reconstituted 3-formamidosalicylate pharmacophore in *Escherichia coli*. *ACS Synth Biol*, 4:559-565
18. Gao H, Grüşchow S, Barke J, **Seipke RF**, Hill LM, Orivel J, Yu DW, Hutchings MI, Goss RJM. 2014. Filipins: the first antifungal “weed killers” identified from bacteria isolated from the trap-ant. *RSC Adv*, 4:57267-57270
17. **Seipke RF**#, Patrick E, Hutchings MI#. 2014. Regulation of antimycin biosynthesis by the orphan ECF RNA Polymerase sigma factor  $\sigma^{AntA}$ . *PeerJ* 2:e253
16. **Seipke RF**# and Hutchings MI#. 2013. The regulation and biosynthesis of antimycins. *Beilstein J Org Chem* 9:2556-2563
15. **Seipke RF**#, Barke J, Heavens D, Yu DW, Hutchings MI#. 2013. Analysis of bacterial communities associated with two ant-plant symbioses. *MicrobiologyOpen* 2:276-283
14. Clark LC, **Seipke RF**, Prieto-Aranda P, Willemsse J, van Wezel GP, Hutchings MI, Hoskisson PA. 2012. Mammalian cell entry genes in *Streptomyces* may provide clues to the evolution of bacterial virulence. *Sci Rep* 3:1109
13. **Seipke RF**, Grüşchow S, Goss RJM, Hutchings MI. 2012. Isolating antifungals from fungus growing ant symbionts using a genome-guided chemistry approach. *Methods in Enzymology* 517:47-70
12. Moore JM, Bradshaw E, **Seipke RF**, Hutchings MI, McArthur M. 2012. Use and discovery of chemical elicitors that stimulate *Streptomyces* bacteria. *Methods in Enzymology* 517:367-385
11. **Seipke RF**, Kaltenpoth M, Hutchings MI. 2012. Streptomycetes as symbionts, an emerging and widespread theme? *FEMS Microbiol Rev* 36:862-876
10. **Seipke RF**#, Barke J, Brearley C, Hill L, Yu DW, Goss RJ, Hutchings MI#. 2011. A single *Streptomyces* symbiont makes multiple antifungals to support the fungus farming ant *Acromyrmex octospinosus*. *PLoS One* 6:e22028
9. **Seipke RF**, Song L, Bicz J, Laskaris P, Yaxley AM, Challis GL, Loria R. 2011. The plant pathogen *Streptomyces scabies* 87-2 has a functional pyochelin biosynthetic pathway that is regulated by TetR- and AfsR-family proteins. *Microbiology* 157:2681-2693
8. **Seipke RF**, Barke J, Orivel J, Yu DW, Ruiz-Gonzalez RX, Hutchings MI. 2011. Fungus-growing *Allomerus* ants are associated with antibiotic-producing actinobacteria. *Antonie Van Leeuwenhoek* 101:443-447
7. **Seipke RF**, Crossman L, Drou N, Heavens D, Caccamo M, Bibb MJ, Hutchings MI. 2011. Draft genome sequence of *Streptomyces* S4, a symbiont of the leafcutter ant *Acromyrmex octospinosus*. *J Bacteriol* 193:4270-4271 \*\*Featured on the front cover with image\*\*

6. Barke J, **Seipke RF**, Yu DW, Hutchings MI. 2011. A mutualistic microbiome: how do fungus-growing ants select their antibiotic-producing bacteria? *Comm Int Biol* 4:41-43
5. Barke J, **Seipke RF**, Grüşchow S, Heavens D, Drou N, Bibb MJ, Goss RJ, Yu DW, Hutchings MI. 2010. A mixed community of actinomycetes produce multiple antibiotics for the fungus farming ant *Acromyrmex octospinosus*. *BMC Biol* 8:109
4. Bignell DR, **Seipke RF**, Huguet-Tapia JC, Chambers AH, Parry RJ, Loria R. 2010. *Streptomyces scabies* 87-22 contains a coronafacic acid-like biosynthetic cluster that contributes to plant-microbe interactions. *Mol Plant Microbe Interact* 23:161-175
3. **Seipke RF**, Loria, R. 2009. Hopanoids are not essential for growth of *Streptomyces scabies* 87-22. *J Bacteriol* 191:5216-5223
2. **Seipke RF**, Loria R. 2008. *Streptomyces scabies* 87-22 possesses a functional tomatinase. *J Bacteriol* 190:7684-7692
1. Loria R, Bignell DR, Moll S, Huguet-Tapia JC, Joshi MV, Johnson EG, **Seipke RF**, Gibson DM. 2008. Thaxtomin biosynthesis: The path to plant pathogenicity in the genus *Streptomyces*. *Antonie Van Leeuwenhoek* 94:3-10

## **SEMINARS**

### **Invited:**

- |      |   |
|------|---|
| 2017 | “Understanding acyltransferase promiscuity”. BBSRC Natural Products Discovery and Bioengineering Network Workshop, Manchester                                 |
| 2016 | “Regulation and biosynthesis of actinomycete natural products”. Combating Infectious Disease symposium, University of York.                                   |
| 2016 | “Regulation and biosynthesis of microbial natural products”. School of Molecular & Cellular Biology, University of Leeds                                      |
| 2016 | “Regulation and biosynthesis of microbial natural products”. Strathclyde Institute of Pharmacy and Biomedical Sciences, University of Strathclyde             |
| 2016 | “Regulation and biosynthesis of natural products by insect-associated actinomycetes”. Microbiology Society, Annual Meeting                                    |
| 2015 | “Discovery, biosynthesis and bioengineering natural product antimycotics”. School of Medicine, University of Leeds  |
| 2015 | “Regulation and biosynthesis of microbial natural products”. Heredity, Development and Disease theme seminar, School of Biology, University of Leeds          |
| 2015 | “The silent majority: accessing silent natural product biosynthetic pathways”. BBSRC Natural Products Discovery and Bioengineering Network on AMR, Manchester |
| 2013 | “Leafcutter ants and their antifungal-producing bacteria”. Centre for Bacterial Cell Biology, Newcastle University  |
| 2013 | “The regulation of antimycin biosynthesis”. Department of Molecular Microbiology, John Innes Centre   |
| 2009 | “Biosynthesis and regulation of pyochelin in <i>Streptomyces scabies</i> ”. School of Biological Sciences, University of East Anglia                          |

### **Offered:**

- |      |   |
|------|---|
| 2014 | ESF Synthetic Biology of Antibiotic Production II, “Understanding and manipulating antimycin-type depsipeptide biosynthesis and its regulation”                           |
| 2013 | Society for General Microbiology, Spring Meeting, “Antimycin biosynthesis is regulated by a unique pathway-specific RNA polymerase sigma factor”                          |
| 2010 | Society for General Microbiology, Spring Meeting, “Leafcutter ant symbionts and their antifungal compounds”   |
| 2006 | Society for Industrial Microbiology, Annual Meeting, “Hopanoids are required for normal morphological development and melanin production in <i>Streptomyces scabies</i> ” |

## **PROFESSIONAL SERVICE:**

### **Service to UK funding bodies:**

2017 - Present Member, BBSRC Pool of Experts

- 2015 - Present Management board, BBSRC Natural Products Discovery and Bioengineering Network
- 2015 - Present Grant Reviewer (**13 total**):  
BBSRC (8); MRC (3); Daphne Jackson Trust (1); Wellcome Trust (1)

**Service to international funding bodies:**

- 2018 - Present Grant reviewer for The Austrian Science Fund (1)
- 2016 - Present Grant Reviewer for Chilean National Science and Technology Commission (1)

**Service to learned societies:**

- 2017 - Present Grant Reviewer for Microbiology Society Research Visit Grants
- 2015 - 2018 **Elected member** of the Prokaryotic Division Committee of the Microbiology Society
- 2018 Annual meeting activities  
Co-organiser of “Cool tools for microbial imaging”  
Co-chair of “Prokaryotic genetics and genomics forum”  
Co-chair of “Environmental and applied microbiology forum”
- 2017 Annual meeting activities  
Member, conference programme re-design focus group  
Co-chair of “Prokaryotic genetics and genomics forum”  
Co-chair of “Environmental and applied microbiology forum”
- 2016 Annual meeting activities  
Co-chair of “Novel tools for manipulation of genes and genomes”  
Co-chair of “Insights from within: current advances in understanding microbial interactions with insects”  
Co-chair of “Environmental and applied microbiology forum”
- 2015 Annual meeting activities  
Co-chair of “Environmental and applied microbiology forum”
- 2015 Poster Judge for the Royal Society of Chemistry Directing Biosynthesis IV

**Service to professional publications:**

- 2011 Commentator: Interviewed source, Academic Opportunities in European Science, *Science Magazine*, Oct 21, 2011
- 2009 - Present Article referee (**50 total**):  
*ACS Chemical Biology* (1); *ACS Synthetic Biology* (1); *Antibiotics* (2); *Antonie Van Leeuwenhoek Journal of Microbiology* (3); *Applied and Environmental Microbiology* (7); *Beilstein Journal of Organic Chemistry* (2); *BMC Microbiology* (1); *BMC Evolutionary Biology* (1); *FEMS Microbiology Ecology* (1); *FEMS Microbiology Letters* (2); *Journal of Basic Microbiology* (1); *Journal de Mycologie Médicale* (1); *Marine Drugs* (3); *Microbiology* (3); *Microbiological Research* (1); *Mini Reviews in Organic Chemistry* (1); *Molecular Microbiology* (1); *Molecular Plant-Microbe Interactions* (1); *Natural Product Reports* (1); *Nature Communications* (2); *Nature Scientific Reports* (7); *PLoS One* (5); *PeerJ* (2)

**Service to the School / Faculty:**

- 2018 - Present Faculty of Biological Sciences Biosafety Committee
- 2018 Faculty Task and Finish Group for creation of FOBS1135
- 2017 - Present School of Molecular and Cellular Biology Mitigating Circumstances Committee
- 2017 - Present Deputy Programme Leader for Microbiology BSc degree
- 2014 - Present Undergraduate and postgraduate student assessment: PhD viva examiner (4); PhD transfer viva examiner (5); MSc and MBIol viva examiner (5)

**Current professional affiliations and memberships to learned societies:**

- 2018 - Present American Chemical Society
- 2017 - Present Fellow of the Higher Education Academy

2009 - Present Microbiology Society  
2004 - Present American Society for Microbiology (not a member during 2009-2011 and 2013-2016)

### **CONFERENCE ATTENDANCE**

2018 Microbiology Society Annual Meeting, 9 - 13 Apr  
2017 BBSRC NPRONET Annual Workshop, 4-5 Oct  
2017 The Chemistry and Biology of Natural Products Symposium XI, 29 - 30 Jun  
2017 International Symposium for the Biology of Actinomycetes, 23 - 27 May  
2017 Microbiology Society Annual Meeting, 2 - 6 Apr  
2016 University of York Combating Infectious Disease Symposium, 05 Dec  
2016 BBSRC NPRONET Annual Workshop, 25-26 Oct  
2016 The Astbury Conversation, 11-12 Apr  
2016 Microbiology Society Annual Meeting, 20 - 24 Mar  
2016 The Royal Society New Bacteriology Meeting, 28 - 29 Jan  
2015 BBSRC BIOCNET/NPRONET Annual Workshop: Application of biosynthetic enzymes and cascades for industrial biotechnology, 30 Nov - 1 Dec  
2015 The Chemistry and Biology of Natural Products Symposium IX, 25 - 26 Jun  
2015 Society for General Microbiology Annual Meeting, 30 Mar - 2 Apr  
2015 Royal Society of Chemistry Directing Biosynthesis IV, 25-27 Mar  
2015 BBSRC NPRONET Workshop: How to Tackle Antimicrobial Resistance, 29 Jan  
2014 EPSRC/BBSRC Workshop: Physics Life in Extreme Environments, 10 - 11 Nov  
2014 International Symposium for the Biology of Actinomycetes, 8 - 12 Oct  
2014 1st Midlands Molecular Microbiology Meeting, 15 - 16 Sept  
2014 ESF Synthetic Biology of Antibiotic Production II, 30 Aug - 4 Sept  
2014 Society for General Microbiology Annual Meeting, 14 - 17 Apr  
2014 EPSRC/BBSRC Workshop: Physics of Bacterial Infection Workshop, 27 - 28 Mar  
2013 Society for General Microbiology Annual Meeting, 25 - 28 Mar  
2012 American Society for Microbiology General Meeting, 16 - 19 Jun  
2011 International Symposium on the Biology of Actinomycetes, 11 - 15 Dec  
2011 Society for General Microbiology Spring Meeting, 11 - 14 Apr  
2011 Royal Society of Chemistry Symposium: Antibiotics 2011 - Where Now? 20 Jan  
2010 Society for General Microbiology Autumn Meeting, 6 - 9 Sept  
2010 European Cooperation in Science and Technology Workshop: Evolution and Diversity of Symbioses of Arthropods, 30 Jun - 3 Jul  
2008 American Society for Microbiology General Meeting, 1 - 5 Jun  
2007 American Society for Microbiology General Meeting, 21 - 25 May  
2006 Society for Industrial Microbiology Annual Meeting, 30 Jul - 3 Aug  
2005 Joint Meeting of the International Union of Microbiological Societies, 23 - 28 Jul  
2005 International Society for Molecular Plant-Microbe Interactions Congress, 17 - 22 Jul

### **SUPERVISION AND MENTORING**

#### **Postdoctoral supervision:**

2017 - 2018 Dr. Daniel Francis (BBSRC NPRONET-funded, PI)  
2016 - 2019 Dr. Bohdan Bilyk (BBSRC-funded, PI)

#### **Postgraduate major supervision:**

2017 - 2020 Asif Fazal (Wellcome Trust-funded PhD student, Co-supervisor = Michael Webb)  
2017 - 2018 Connor Macey (Self-funded MRes student, Co-supervisor = Christopher Randall)  
2015 - 2019 Divya Thankachan (Leeds-funded PhD student, Co-supervisor = Kenneth McDowall)

#### **Co-supervision of students and staff:**

2018 - 2019 David Sharples (BBSRC NPRONET-funded Research technician, Supervisor =

Alex O'Neill)  
2015 - 2019 Ayat Al-Tarawni (Self-funded PhD student, Supervisor = Kenneth McDowall)

**Undergraduate lab supervision:**

2017 - 2018 Adel Hussein, Microbiology BSc/MBiol student  
2017 Jack Gough, Biological Sciences BSc student  
2017 Steven Weatherson, Microbiology BSc student  
2017 Katie Poulter, Genetics BSc student  
2016 - 2017 Michelle Goutziers, Erasmus student from Techniek College Rotterdam  
(Supervised by Alex O'Neill)  
2016 Ellie Harris, Biological Sciences BSc student  
2016 Rebecca Joynt, Biochemistry Ind BSc student  
2015 - 2016 Adam Jalal, Biological Sciences BSc/MBiol student  
2015 - 2016 Thomas McLean, Microbiology BSc/MBiol student  
2015 Callum Ditondo, Biological Sciences BSc student  
2014 Lucy Wallace, Microbiology BSc student  
2014 Emma Warner, Microbiology BSc student

**TEACHING**

**Mentionables:**

2018 Student-invited seminar speaker, University of Leeds Microbiology Society  
2017 Faculty of Biological Sciences Inspirational Teaching Award Nominee  
2016 Student-invited seminar speaker, University of Leeds Microbiology Society

**Modules taught:**

2016 - Present BLGY1128 - The Living Planet  
2015 - Present BIOC3231/32/BIOL3211/MICR3212 - Natural products discovery  
2015 - Present BIOL5380M - Extended Research Project  
2015 - Present BIOL5398M - Specialised Research Topics and Skills  
2015 - Present MICR1320 - Introduction to Microbiology  
2015 - Present MICR2320 - Skills for Microbiologists  
2014 - Present BIOL2110 - Power of Bacterial Genomics [**Module Manager 2015 - Present**]  
2014 - Present BIOL3306 - Biological Sciences Research Project  
2014 - Present MICR1320 - Skills for Microbiologists  
2014 - Present MICR3110 - Microbiology Research Programme  
2014 - Present MICR3190 - Microbiology Research Programme  
2013 - Present BIOL3305 - Advanced Skills in the Biosciences

Currently serving as personal tutor for 20 undergraduate students at various stages in their degree.

**COMMUNITY INVOLVEMENT AND OUTREACH**

2016 Exhibitor, Understanding the Secret Life of Molecules, Parkinson Building, Leeds  
2014 Exhibitor, Royal Society Summer Science Exhibition at Carlton House Terrace, London  
2013 Workshop Leader, A-level conference at Norwich Castle Museum  
2012 Presenter, Friends of the John Innes Centre at The Genome Analysis Centre  
2012 Workshop Demonstrator, Biodiversity and Extinction in Norfolk and Beyond at Norwich Castle Museum  
2010 Presenter, Biodiversity 2010 at Norwich Cathedral