

Kevin R. Foster

Address Department of Zoology, South Parks Road, Oxford University, UK
Email Kevin.Foster@zoo.ox.ac.uk
Nationality British
Website <http://www.zoo.ox.ac.uk/group/foster/index.html> (with pdf files of pubs)

Education (UK)

M.A. Natural Sciences (Zoology) 1994-1997 University of Cambridge 1st Class Honours
 Ph.D. Thesis 1997-2000 University of Sheffield

Thesis title: *The conflict over male production in the Vespinae wasps* (with Francis Ratnieks)

Jobs

Huxley Research Fellow 2001-2004 Rice University, Houston, Texas
 Working with Strassmann and Queller on social amoebae

Fellow 2004-2005 Institute for Advanced Study, Berlin.
 Member of the focus group “Conflict Resolution in Biological Systems”

Postdoctoral Fellowship 2005-2006 University of Helsinki, Finland
 Working with Hanna Kokko on simulation models of between-species cooperation

Bauer Fellow 2006-2010 Harvard University

Professor of Evolutionary Biology 2010- University of Oxford
 Full Professor

Research interests

- Evolution and genetics of social behavior, particularly in microorganisms.
- Theory of social behavior and evolution

Book Chapters

1. Foster KR 2010 Social behavior in microorganisms. In: Social behaviour: genes, ecology and evolution (Tamas Szekely, Allen J. Moore & Jan Komdeur, eds.). Cambridge University Press.
2. Wenseleers, T, Gardner A, Foster KR 2010 Social evolution theory: a review of methods and approaches. In: Social behaviour: genes, ecology and evolution (Tamas Szekely, Allen J. Moore & Jan Komdeur, eds.). Cambridge University Press.
3. Foster K. R. 2008. Behavioral Ecology: Altruism. In: *Encyclopedia of Ecology* (Jorgensen, S. E.). Elsevier, pp 154-159.
4. Gardner, A. and Foster K. R. 2008. The Evolution and Ecology of Cooperation – History and Concepts. In: *Ecology of Social Evolution*. (Korb, J., and Heinze, J.) Springer, New York, Heidelberg, pp 1-36.
5. Queller, D.C., Foster, K.R., Fortunato, A. & Strassmann, J.E 2003. Cooperation and conflict in the social amoeba, *Dictyostelium discoideum*. In: *Social Insects and Sociogenetics*. (Kikuchi, T., Kubo, T., & Higashi, S., pps 173-200). Hokkaido University Press. Sapporo, Japan.

Publications in peer-reviewed journals

1. Mitri S, Foster KR 2013. The genotypic view of social interactions in microbial communities. *Annual Review of Genetics*, in press.
2. Koschwanez J, Foster KR, Murray AJ. 2013. Improved use of a public good selects for the evolution of undifferentiated multicellularity. *eLife*, 2:e00367.
3. Cornforth DM, Foster KR 2013 Competition sensing: the social side of bacterial stress responses. *Nature Reviews Microbiology*, online early.
4. Schluter J, Foster KR. 2012. The evolution of mutualism in gut microbiota via host epithelial selection. *PLoS Biology*, 10(11): e1001424.
5. Caldara M, Friedlander RS, Kavanaugh NL, Aizenberg K, Foster KR, Ribbeck K 2012. Mucin biopolymers prevent bacterial aggregation by retaining cells in the free-swimming state. *Current Biology*, online early.
6. Foster KR, Bell T. 2012. Competition, not cooperation, dominates interactions among culturable microbial species. *Current biology* 22, 1845–1850.
7. Hoffmann K, Foster KR, Korb J. 2012. Nest value mediates reproductive decision making within termite societies. *Behavioral Ecology*, 23, 1203-1208.
8. Koschwanez J, Foster KR, Murray AJ. 2011. Sucrose utilization in budding yeast as a model for the origin of undifferentiated multicellularity. *Plos Biology*, *Plos Biology*, 9(8): e1001122..
9. Korolev KS, Xavier JB, Nelson DR, Foster KR 2011. A quantitative test of population genetics using spatio-genetic patterns in bacterial colonies. *American Naturalist*, 178: 538-552.
10. Mitri S, Xavier J, Foster KR 2011 Social evolution in multispecies biofilms *Proceedings of the National Academy of Sciences*, 108 Suppl 2: 10839-46.
11. Foster KR. 2011 The sociobiology of molecular systems. *Nature Reviews Genetics*, 12: 193-203.
12. Foster K.R. 2011 The secret social lives of microorganisms. *Microbe*, 6:183-186.
13. Xavier, J., Kim, W., Foster K.R. 2011 A molecular mechanism that stabilizes cooperative secretions in *Pseudomonas aeruginosa*. *Molecular Microbiology*, 79, 166-179.
14. Ratnieks FLW, Foster KR, Wenseleers T. 2011 Darwin's special difficulty: the evolution of "neuter insects" and current theory. *Behavioral Ecology and Sociobiology*, 65:481–492.
15. Foster KR. 2011 Q&A *Current Biology*, 21, R58-59
16. Korb J, Foster KR 2010 Ecological competition favours cooperation in termite societies. *Ecology Letters*, 13: 754-760.
17. Nadell CD, Foster KR, Xavier J. 2010 Emergence of spatial structure in cell groups and the evolution of cooperation. *PLoS Computational Biology*, 6: e1000716.
18. Foster KR, Pizzari T 2010 The secret society of sperm. *Current Biology*, 20: R314-316.
19. Foster KR 2009 A defense of sociobiology. *Cold Spring Harbor Symposium on Quantitative Biology*, Cold Spring Harbor Press, Volume LXXIV, 403-418.
20. Korb J, Weil T, Hoffmann K, Foster KR, Rehli M 2009. A gene required for reproductive suppression in termites. *Science*, 324: 758.
21. Baker AS, Foster KR 2009 *Vulgarogamasus sphecoophilus* (Cooreman) comb. nov. (Acari: Mesostigmata: Parasitidae): a redescription and new hymenopteran association. *Zootaxa*, 2088: 51–64.
22. Nadell CD, Xavier J, & Foster, KR 2009 The sociobiology of biofilms. *FEMS microbiology reviews*, 33: 206-224.
23. Xavier J, Martinez-Garcia E. & Foster, KR 2009 Social evolution of spatial patterns in bacterial biofilms: when conflict drives disorder. *American Naturalist*, 174: 1-12.
24. Smukalla S, Caldara M, Pochet N, Beauvais A, Guadagnini S, Yan C, Vincens MD, Jansen A, Christine Prevost M, Latge J, Fink GR, Foster KR, Verstrepen KJ 2008. FLO1 is a variable green beard gene that drives biofilm-like cooperation in budding yeast. *Cell* 135: 727-737.
25. Foster KR, Kokko H 2008 The evolution of superstitious and superstition-like behaviour. *Proceedings of the Royal Society of London, Series B*, 276: 31-37.
26. Lehmann L, Foster KR, Borenstein E, Feldman, MW 2008 Social and individual learning of helping in humans. *Trends in Ecology and Evolution*, 23: 664-671.

27. Pizzari, T, Foster KR 2008 Sperm sociality: cooperation, altruism, and spite. *Plos Biology*, 6: e130.
28. Lehmann L, Feldman MW, Foster KR 2008 Cultural transmission can inhibit the evolution of altruistic helping. *American Naturalist*, 172: 12-24.
29. Nadell CD, Xavier J, Levin SA, & Foster, KR 2008 The evolution of quorum sensing in bacterial biofilms. *Plos Biology*, 6: e14
30. Gilbert*, O., Foster*, K. R., Mehdiabadi, N. J., Strassmann, J. E, and Queller, D. C. 2007 High relatedness maintains multicellular cooperation in a social amoeba by controlling cheater mutants *Proceedings of the National Academy of Sciences*, 104: 8913-8917
31. Foster, K. R. and Xavier, J. B. 2007 Bridging ecology and sociobiology. *Current Biology*, 17: R319-R321
32. Rankin, D. J., López-Sepulcre, A., Foster, K.R. Kokko, H. 2007. Species-level selection reduces selfishness through competitive exclusion. *Journal of Evolutionary Biology*, 20: 1459-1468
33. Xavier, J.B., and Foster, K.R. 2007 Cooperation and conflict in microbial biofilms. *Proceedings of the National Academy of Sciences*, 104: 876-881.
34. Foster, K.R., Parkinson, K. and Thompson, C. R. L. 2007 What can microbial genetics teach sociobiology? *Trends in Genetics*, 23:73-80.
35. Kuzdzal-Fick, J.J., Foster, K. R., Queller, D. C., and Strassmann, J. E. 2007 Exploiting new terrain: an advantage to sociality in the slime mold *Dictyostelium discoideum*. *Behavioral Ecology*, 18: 433-437.
36. Ratnieks, F.L.W., Helanterä, H., and Foster, K. R. 2007 Are mistakes inevitable? Sex allocation specialization by workers can reduce the genetic information needed to assess queen mating frequency. *Journal of Theoretical Biology*, 244: 470-477.
37. Foster, K.R., Wenseleers, T., Ratnieks, F.L.W. and Queller, D. C. 2006. There is nothing wrong with inclusive fitness. *Trends in Ecology and Evolution*, 21: 599-600.
38. Foster, K.R. 2006. The Phoenix Effect. *Nature*, 441, 291-292
39. Foster, K.R., Kokko, H. 2006. Cheating can stabilise cooperation in mutualisms. *Proceedings of the Royal Society of London, Series B*, 273: 2233-2239
40. Foster, K.R. 2006. Balancing synthesis with pluralism in sociobiology *Journal of Evolutionary Biology*, 19: 1394-1396
41. Foster, K.R., Wenseleers, T. 2006. A general model for the evolution of mutualisms *Journal of Evolutionary Biology*, 19: 1283-1293
42. Foster, K.R., Wenseleers, T. and Ratnieks, F.L.W. 2006. Kin selection is the key to altruism. *Trends in Ecology and Evolution*, 21, 57-60
43. Foster K.R. and Grundmann, H. 2006. Do we need to put society first? The potential for tragedy in antimicrobial resistance. *PLoS Medicine*, 3(2), e29
44. Ratnieks, F. L. W., Wenseleers, T., Foster, K. R. 2006. Conflict resolution in insect societies. *Annual Review of Entomology*, 51, 581-608.
45. Foster KR. 2005. Hamiltonian Medicine: why the social lives of pathogens matter. *Science* 308, 1269-1270.
46. Foster KR, Ratnieks FLW 2005. A new eusocial vertebrate? *Trends in Ecology and Evolution*, 20, 363-364
47. Castillo D, Switz G, Foster KR, Strassmann JS, Queller DC. 2005 A cost to chimerism in *Dictyostelium discoideum* on natural substrates. *Evolutionary Ecology Research* 7, 263-271.
48. Foster KR., Shaulsky G, Strassmann, J. E., Queller, D. C., Thompson, C. R. L. 2004. Pleiotropy as a mechanism to stabilise cooperation. *Nature* 431, 693-696
49. Foster KR. 2004. Diminishing returns in social evolution: the not-so-tragic commons. *Journal of Evolutionary Biology*, 17,1058-1072
50. Dani FR, Foster KR , Zacchi F, Seppä P, Massolo A, Carelli A, Arevalo E , Queller DC, Strassmann JE, Turillazzi S. 2004. Can cuticular lipids provide sufficient information for within colony nepotism in wasps? *Proceedings of the Royal Society of London, Series B* 271, 745-753
51. Foster KR, Fortunato A, Strassmann JE, Queller DC. 2002. The costs and benefits of being a chimera. *Proceedings of the Royal Society of London, Series B*, 269, 2357-2362.

52. Foster KR, Gulliver J, Ratnieks FLW. 2002. Why workers do not reproduce: worker policing in the European hornet *Vespa crabro*. *Insectes sociaux*, **49**, 41-44.
53. Foster KR, Ratnieks FLW. 2001a. The effect of sex allocation biasing on the evolution of worker policing in hymenopteran societies. *American Naturalist*, **158**, 615-623.
54. Foster KR, Wenseleers T, Ratnieks FLW. 2001. Spite: Hamilton's unproven theory. *A tribute to W. D. Hamilton, Annales Zoologici Fennici* **38**, 229-238.
55. Ratnieks FLW, Monnin T, Foster KR. 2001. Inclusive fitness theory: novel predictions and tests in eusocial Hymenoptera. *A tribute to W. D. Hamilton, Annales Zoologici Fennici* **38**, 201-214.
56. Foster KR and Ratnieks FLW 2001b. Paternity, reproduction and conflict in vespine wasps: a model system for testing kin selection predictions. *Behavioral Ecology and Sociobiology* **50**, 1-8.
57. Foster KR, Ratnieks FLW, Gyllenstrand N, Thorén PA 2001. Colony kin structure and male production in *Dolichovespula* wasps. *Molecular Ecology* **10**, 1003-1010.
58. Foster KR, Ratnieks FLW 2001c. Convergent evolution of worker policing by egg eating in the honey bee and common wasp. *Proceedings of the Royal Society of London, Series B* **268**, 169-174.
59. Foster KR, Wenseleers T, Ratnieks FLW 2000b. Spite in social insects. *Trends in Ecology and Evolution* **15**, 469-470.
60. Foster KR, Ratnieks FLW 2000. Facultative worker policing in a social wasp. *Nature* **407**, 692-693.
61. Foster KR, Ratnieks FLW, Raybould AF 2000a. Do hornets have zombie workers? *Molecular Ecology* **9**, 735-742.
62. Foster KR, Seppä P, Ratnieks FLW, Thorén PA 1999. Low paternity in the hornet *Vespa crabro* indicates that multiple mating by queens is derived in vespine wasps. *Behavioral Ecology and Sociobiology* **46**, 252-257.

Funding

1. Named researcher on Frontiers in Integrative Biological Research (FIBR) grant "Conflict and cooperation as major forces in evolution: a sociogenomic approach". 2003.
2. Named researcher on National Institutes of Health, Center of Excellence grant "Modular Biology: Experiment, Theory and Computation". 2006.
3. Named researcher on National Institutes of Health, Center of Excellence grant "Biological Diversity: Generation, Control and Exploitation". 2008.
4. Principle Investigator of European Research Council Grant "Social interactions in microbes. 2010

Talks

Over two hundred talks at conferences and departmental visits (around a hundred invited talks).