

## Curriculum vitae

Dr. Sébastien Wielgoss

### Personal information

Position: **Senior Scientist** (ETH)  
Address: Institute of Integrative Biology: Lab for Evolutionary Biology  
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### Profile in brief

I'm a microbiologist studying the ecology and evolution of experimental and natural populations of bacteria. In particular, I have investigated the genomic composition and molecular basis of cooperative behavior in social groups of myxobacteria in soil. For my work, I have applied experimental microbiology, molecular biology, bioinformatics, and computational statistics.

### Education

08/2004 – 06/2009 **PhD (Dr. rer. nat.)** in Population Genetics, **University of Konstanz** (D)  
10/2000 – 06/2004 **Diplom (Master degree)** in Agrobiologie, **University of Hohenheim** (D)  
09/1999 – 09/2000 **Vordiplom (Undergraduate degree)** in Agricultural Sciences, **TU Munich** (D)

### Research Experience and Scientific Mobility

11/2019 – **Senior Scientist**, Institute of Integrative Biology (IBZ), **ETH Zurich** (CH)  
04/2014 – 10/2019 **Research associate**, Laboratory for Evolutionary Biology, Institute of Integrative Biology (IBZ), **ETH Zurich** (CH)  
03/2012 – 03/2014 **Marie Curie Research Fellow**, Laboratory for Evolutionary Biology (IBZ), Institute of Integrative Biology, **ETH Zurich** (CH)  
05/2009 – 02/2012 **CNRS Research fellow**, Laboratory for Adaptation and Pathogenesis of Microorganisms (CNRS), **University Grenoble-Alpes** (F)  
08/2004 – 06/2009 **PhD student** (with Prof. Axel Meyer and Prof. Thierry Wirth), Laboratory for Zoology and Evolutionary Biology, Department of Biology, **University of Konstanz** (D)  
08/2003 – 06/2004 **Master student** (with Prof. Nicolaus von Wirén), Institute for Plant Nutrition, **University of Hohenheim** (D), work conducted at **Ecwork GmbH**, Vienna (A)

### Personal fellowships and grants

04/2013 – 03/2015 **Marie Curie Postdoctoral Fellowship** (IEF) for Career Development (FP7) awarded by the European Union for research at ETH Zurich (CH)  
05/2009 – 02/2012 **ANR research grant** awarded to host laboratory by the CNRS (F)  
04/2007 – 12/2008 **PhD fellowship** awarded by the State Graduate Support Act Baden-Wuerttemberg  
08/2003 – 11/2003 **Master student fellowship** by the German Academic Exchange Service, DAAD

## Student mentoring and supervision (past five years)

- 03/2020 – 06/2020 **Bachelor's thesis student** (Felix Specker), ETH Zurich (CH), Title: “Phylogenetic relationship of natural *Myxococcus xanthus* isolates and the characterisation of Mx-alpha-like elements”
- 03/2019 – 09/2019 **Master's thesis student** (Lasse Nielsen), ETH Zurich (CH), Title: “The diversity of CRISPR-Cas systems in natural isolates of myxobacteria”
- 06/2017 – 08/2017 **Bachelor's thesis student** (Céline Capelli), ETH Zurich (CH), Title: “Spore production efficiency among single clone isolates from the same fruiting body of *Myxococcus xanthus*.” (\*)
- 04/2015 – 12/2015 **Graduate student** (PhD candidate Ramith Nair), ETH Zurich (CH), Title: “Biotic interactions of *Myxococcus xanthus*.” (\*\*)
- 04/2015 – 10/2015 **Master's thesis student** (Jenny Spaak), ETH Zurich (CH), Title: “The influence of social diversity on the evolution of natural population isolates of *Myxococcus xanthus* when facing novel environments. “
- 12/2014 – 06/2015 **Master's thesis student** (Rebekka Wolfensberger), ETH Zurich (CH), Title: “Elucidating molecular mechanisms of social traits in natural isolates of *Myxococcus xanthus* and the identification of social complementation in developmentally defective clones.” (\*)

(\*) published article in Wielgoss, et al. (2019) *Science*; (\*\*) published in Nair, et al. (2019) *Nat Com*

## Lectures

- since 09/2016 **Experimental Evolution** (of microbes) for Master's and PhD students, ETH Zurich (CH), appr. 25 students, in English
- 02/2014 – 08/2020 **Fundamentals of Biology** for Bachelor's students, ETH Zurich (CH), appr. 300 students, in German
- since 09/2013 **Introduction to Evolutionary Biology** for Bachelor's students, ETH Zurich (CH), appr. 200 students, in English
- 05/2005 – 05/2007 **Lab course on molecular markers and phylogenetics** for Master's students, University of Konstanz (D), appr. 30 students, in English

## Workshop attendances

- 06/2021 **PHROGATHON**, *phages.fr* (FR, online) (1 day)
- 01/2020 **Microbiota Data Analysis**, *ETH Zürich* (CH) (3 days)
- 02/2017 **Triple A Winterschool: Assembly, Annotation and Analysis of Whole Genome Sequence Data**, Monte Verita, Ascona, by *ETH Zürich* (5 days)
- 09/2014 **Stage presence and classroom management**, *ETH Zürich* (1 day)
- 09/2014 **Elements of R for Genetics and Bioinformatics & Population genetic Data Analysis**, at Université Lausanne (5 days)
- 05/2013 **Promises of Big Data across Disciplines**, at the Okinawa Institute of Science and Technology (OIST), Japan (3 weeks)
- 06/2012 **BEACON class on Next Generation Sequencing** at Kellogg Biological Station, Michigan State University, USA (2 weeks)
- 09/2012 **Microbiota 2012**, University Basel (4 days); Hands-on workshop on using *Qiime*, and *MEGAN*

## Institutional responsibilities

- 07/2021 – Study coordinator for Ecology & Evolution (Master), ETH Zurich (CH)
- 06/2021 – Study advisor for Environmental biology (Bachelor), ETH Zurich (CH)
- 07/2020 – Member of the Teaching Commission, ETH Zurich (CH)
- 11/2019 – Member of the IBZ Institute’s Council, ETH Zurich (CH)
- 08/2002 – 07/2003 Member of the senate at the *University of Hohenheim* (D)
- 08/2002 – 07/2003 Vice-chair of the student association *AStA*, *University of Hohenheim* (D)

## Hobbies and interests:

- System Administration (Linux, Microsoft, MacOS)
- Running (regularly with running group, competitions: e.g., SOLA Zürich, Greifenseelauf Uster)
- Writing (eg, article for ETH student newspaper *Biotikum* on [Evolution](#))
- Playing the guitar
- Reading books
- Travelling (Europe, Japan, USA)
- Playing cards and board games

## Publications

### Journal articles

20. **Wielgoss S**, Wolfensberger R, Sun L, Fiegna F, Velicer GJ (2019). Social genes are selection hotspots in kin groups of a soil microbe. *Science*, 363: 1342–1345. *Corresponding author*.
19. Nair RR, Vasse M, **Wielgoss S**, Sun L, Yu YTN, Velicer GJ (2019). Bacterial predator-prey coevolution accelerates genome evolution and selects on virulence-associated prey defences. *Nature Communications*, 10: 4301. (previously deposited on: *bioRxiv* 2018, 398495; doi.org/10.1101/398495).
18. Vasse M, **Wielgoss S** (2018). Bacteriophages of *Myxococcus xanthus*, a social bacterium. *Viruses*, 10: 374. doi: 10.3390/v10070374. *Co-corresponding author*.
17. **Wielgoss S**, Fiegna F, Rendueles O, Yu YTN, Velicer GJ (2018). Kin discrimination and outer membrane exchange in *Myxococcus xanthus*: a comparative analysis among natural isolates. *Molecular Ecology*, 27: 3146–3158. doi: 10.1111/mec.14773. *Co-corresponding author*.
16. **Wielgoss S**, Didelot X, Chaudhuri RR, Liu X, Weedall GD, Velicer GJ and Vos M (2016). A barrier to homologous recombination between sympatric strains of the cooperative soil bacterium *Myxococcus xanthus*. *The ISME Journal*, 10: 2468–2477.
15. Kraemer SA\*, **Wielgoss S\***, Fiegna F and Velicer GJ (2016). The biogeography of kin discrimination across microbial neighborhoods. *Molecular Ecology*, 25: 4875–4888. \*equal contributions. *Co-corresponding author*.
14. Tenaillon O, Barrick JE, Ribick N, Deatherage DE, Blanchard JL, Dasgupta A, Wu GC, **Wielgoss S**, Cruveiller S, Médigue C, Schneider D and Lenski RE (2016). Tempo and mode of genome evolution in a 50,000-generation experiment. *Nature*, 536: 165–170.

13. **Wielgoss S**, Bergmiller T, Bischofberger A and Hall A (2016). Adaptation to parasitic viruses and costs of parasite resistance in mutator and non-mutator bacteria. *Molecular Biology and Evolution*, 33: 770–782. *Co-corresponding author*.
12. Rendueles O, Zee PC, Dinkelacker I, Amherd M, **Wielgoss S** and Velicer GJ (2015). Rapid and widespread de novo evolution of kin discrimination. *PNAS: Proceedings of the National Academy of Sciences of the United States of America*, 112: 9076–9081.
11. Rajagopalan R, **Wielgoss S**, Lippert G, Velicer GJ and Kroos L (2015). *devI* is an evolutionarily young negative regulator of *Myxococcus xanthus* development. *Journal of Bacteriology*, 197: 1249–1262.
10. **Wielgoss S**, Gilabert A, Meyer A and Wirth T (2014). Introgressive hybridization and latitudinal admixture clines in North Atlantic eels. *BMC Evolutionary Biology*, 14: 61.
9. **Wielgoss S**, Barrick JE, Tenaillon O, Wisner M, Dittmar J, Cruveiller S, Chane-Woon-Ming B, Médigue C, Lenski RE and Schneider D (2013). Mutation rate dynamics in a bacterial population reflect tension between adaptation and genetic load. *PNAS: Proceedings of the National Academy of Sciences of the United States of America*, 110: 222–227.
8. Lefebvre F, **Wielgoss S**, Nagasawa K and Moravec F (2012). On the origin of *Anguillicoloides crassus*, the invasive nematode of anguillid eels. *Aquatic Invasions*, 7: 443–453.
7. **Wielgoss S**, Barrick JE, Tenaillon O, Cruveiller S, Chane-Woon-Ming B, Médigue C, Lenski R and Schneider D (2011). Mutation rate inferred from synonymous substitutions in a long-term evolution experiment with *Escherichia coli*. *G3: Genes|Genomes|Genetics*, 1: 183–186.
6. Hindré T, Le Gac M, Plucain J, **Wielgoss S**, Gaffé J, Schneider D (2010). Evolution in action: dream or reality? *BIOFUTUR*, 29: 52–56. (in French)
5. **Wielgoss S**, Hollandt F, Wirth T and Meyer A (2010). Genetic signatures in an invasive parasite of *Anguilla anguilla* correlate with differential stock management. *Journal of Fish Biology*, 77: 191–210.
4. **Wielgoss S**, Taraschewski H, Meyer A and Wirth T (2008). Population structure of the parasitic nematode *Anguillicola crassus*, an invader of declining North-Atlantic eel stocks. *Molecular Ecology*, 17: 3478–3495.
3. **Wielgoss S**, Wirth T and Meyer A (2008). Isolation and characterization of twelve dinucleotide microsatellites in the European eel, *Anguilla anguilla* L., and tests of amplification in other species of eels. *Molecular Ecology Resources*, 8: 1382–1385.
2. Sasal P, Taraschewski H, Valade P, Grondin H, **Wielgoss S** and Moravec F (2008). Parasite communities in eels of the Island of Reunion (Indian Ocean): a lesson in parasite introduction. *Parasitology Research*, 102: 1343–1350.
1. **Wielgoss S**, Sanetra M, Meyer A and Wirth T (2007). Isolation and characterization of short tandem repeats in an invasive swimbladder nematode, parasitic in Atlantic freshwater eels, *Anguillicola crassus*. *Molecular Ecology Notes*, 7: 1051–1053.

*Monographs (book chapters and theses)*

3. **Wielgoss S**, Leblond P, Masson-Boivin C and Normand P. Evolution underway in prokaryotes (2019). In: Bertrand J-C, Normand P, Ollivier B, Sime-Ngando T (editors). *Prokaryotes and Evolution*; pp 339-391; Chapter 6, Springer Nature Switzerland AG; ISBN: 978-3-319-99784-1.
2. Velicer GJ, Mendes-Soares H and **Wielgoss S** (2014). Whence comes social diversity? Ecological and evolutionary analysis of the Myxobacteria. In: Yang Z, Higgs P (editors). *Myxobacteria: Genomics, Cellular and Molecular Biology*; pp. 1–28, Caister Academic Press; ISBN: 978-1908230348.
1. **Wielgoss S** (2009). Population genetic aspects of a newly established parasite-host system between the nematode invader *Anguillicola crassus*, and the North Atlantic freshwater eels, *Anguilla* sp.

Dissertation 2009, University of Konstanz, Germany. Online resource (KOPS): <http://kops.ub.uni-konstanz.de/volltexte/2009/8134>.