

Yannick Wurm

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Department of Ecology and Evolution, Biophore
Université de Lausanne, 1015 Lausanne, Switzerland

I aim to understand the genetic mechanisms involved in the evolution of animal societies. I apply genomics and bioinformatics tools to characterize genes involved in behavioral decisions and caste-specific developmental fates in ants.

EXPERIENCE

- 2010 POSTDOCTORAL RESEARCH ASSOCIATE
Department of Ecology & Evolution, University of Lausanne, Switzerland
In collaboration with Prof. Laurent Keller
Projects include: ant genome sequencing and assembly, mapping a “social chromosome”, and gene expression comparisons
- 2006-2009 MEMBER OF SWISS INSTITUTE FOR BIOINFORMATICS PHD TRAINING NETWORK
Courses: Statistical analysis applied to genome and proteome analyses, Probability theory & network inference, Perl best practices, Protein information databases
- 2005-2009 PHD, “SOCIOGENETICS OF FIRE ANTS”
Department of Ecology & Evolution, University of Lausanne, Switzerland
Supervisor: Prof. Laurent Keller
Foci: see publications. I spent 10% of my research time with the ants, 20% in the wet lab (mainly for expression microarray analyses), and 70% on the computer (Ruby & Perl for scripting, R & Bioconductor for analyses)
- 2004 RESEARCH TRAINEE (6 MONTHS)
Department of Biology, McGill University, Montreal, Canada
Supervisor: Prof. Richard Roy
Foci: Immunoprecipitating targets of the Notch transcription factor from specific cells of *C. elegans*, crossing & mapping *C. elegans* gut cell number mutants
- 2003 JUNIOR SOFTWARE DEVELOPER (6 MONTHS)
Krugazor Software, Paris, France
In collaboration with Nicolas Zinovieff
Focus: development of a program for visual representation of models based on ordinary differential equations (implemented in C & Objective-C)
- 2001-2004 ENGINEERING DEGREE IN BIOINFORMATICS AND MODELING (MASTERS-EQUIVALENT)
National Institute of Applied Sciences, INSA Lyon, France
Courses included: biostatistics, genomic data analysis, comparative genomics, population biology modeling, bio-inspired computing, biochemistry, molecular biology and computer science
Major project: Modelling genetic regulation of *E. coli* genomic superhelicity using piecewise-linear differential equations. Supervisors: Drs. H. de Jong, J. Geiselman and H. Charles
- 1999-2001 GENERAL ENGINEERING STUDIES
National Institute of Applied Sciences, INSA Lyon, France
Courses included: mathematics, physics, chemistry
- 1999 SCIENTIFIC BACCALAUREATE (FOCUSING ON LIFE SCIENCES & MATHEMATICS).
Lycée international de Gerland (secondary school), Lyon, France

DISTINCTIONS & GRANTS

- 2009 Research grant from Infectigen: ULTRA-HIGH THROUGHPUT SEQUENCING FOR DISCOVERY AND CHARACTERIZATION OF VIRAL GENOMES IN FIRE ANTS. With E. Zdobnov, L. Keller, D. Shoemaker, S. Valles (100,000 CHF)
- 2008 Grants from Swiss Zoological Society and Fondation du 450^{ième} anniversaire de l'Université de Lausanne to attend the International Congress of Entomology (3,500 CHF)
- 2008 Ecogenics innovation award for my oral communication at Biology08
- 2004 Grants from Région Rhône-Alpes and Office Franco-Québécois de la Jeunesse to visit Prof. Richard Roy's laboratory at McGill University (2,800 euros)
- 2002 Apple Computer scholarship to attend the WorldWide Developer Conference in California (\$1,600)
- 1999 Scientific baccalaureate honors: “Mention Bien”

PUBLICATIONS (° indicates corresponding authorship)

- in prep [Wurm Y°](#), Wang J, Ross KG, Keller L, FIRE ANT WORKERS PREFER QUEENS WITH HIGH MITOCHONDRIAL ACTIVITY
- in prep Nicolas M*, Wang J*, [Wurm Y °*](#), Keller L, METAMORPHOSIS AND GENE EXPRESSION IN FIRE ANTS (*co-first author)
- in prep Oettler J, Wang J, [Wurm Y](#), Heinze J, Keller L, MATING, NOT FECUNDITY, SHAPES GENE EXPRESSION PROFILES OF MATURE ANT QUEENS
- in prep Gotzek D, Robertson HM, [Wurm Y](#), Shoemaker DD, ANALYSIS OF ODORANT BINDING PROTEINS OF THE RED IMPORTED FIRE ANT, *SOLENOPTIS INVICTA* (HYMENOPTERA: FORMICIDAE): AN EXAMPLE OF THE PROBLEMS FACING THE ANALYSIS OF WIDELY DIVERGENT PROTEINS
- in prep Wang J, Ometto L, [Wurm Y](#), Shoemaker DD, Keller L, TRANSCRIPTIONAL RESPONSE TO MICROSPORIDIA INFECTION IN FIRE ANTS
- 2010 [Wurm Y°](#), Keller L, PARASITOID WASPS: FROM NATURAL HISTORY TO GENOMIC STUDIES. *Current Biology* 20:R242-244
- 2010 [Wurm Y°](#), Wang J, Keller L, CHANGES IN REPRODUCTIVE ROLES ARE ASSOCIATED WITH CHANGES IN GENE EXPRESSION IN FIRE ANT QUEENS. *Molecular Ecology* 19(6)
- 2009 [Wurm Y°](#), Uva P, Ricci F, Wang J, Jemielity S, Iseli C, Falquet L, Keller L, FOURMIDABLE: A DATABASE FOR ANT GENOMICS. *BMC Genomics* 10(5):5
- 2007 Wang J, Jemielity S, Uva P, [Wurm Y](#), Gräff J, Keller L, AN ANNOTATED CDNA LIBRARY AND MICROARRAY FOR LARGE-SCALE GENE-EXPRESSION STUDIES IN THE ANT *SOLENOPTIS INVICTA*. *Genome Biology* 8:R9
- 2007 [Wurm Y](#), Wang J, Keller L, BEHAVIORAL GENOMICS: A, BEE, C, G, T. *Current Biology* 17:R51-3
- 2005 Zerlin M, Greiffenberg L, [Wurm Y](#), Winkler I, Kreusel D, Toemoe S, Ballabas L, Martin J, CRYOSTOCK A SOFTWARE FOR CELL CULTURE MANAGEMENT, in Giodia & Fussenegger (eds.) *ESACT Proceedings: Animal Cell Technology Meets Genomics*

CONFERENCE PRESENTATIONS

- [Wurm Y](#), Wang J, Nicolas M, Keller L, METAMORPHOSIS AND GENE EXPRESSION IN FIRE ANTS (oral communications):
2009 European Society for Evolutionary Biology
2009 The Past, Present and Future of Ant Genomics
- [Wurm Y](#), Wang J, Ross KG, Keller L, GENOMIC RESPONSE TO SOCIAL RESTRUCTURING OF FIRE ANT COLONIES (oral communications):
2008 International Congress of Entomology
2008 Biology08
2007 Regulation and Variability of Animal Genome Expression
2007 Integrative Post Genomics
2007 European Society for Evolutionary Biology
- [Wurm Y](#), Wang J, Jemielity S, Keller L, FIRE ANT GENOMICS:
2007 Biology07 (poster presentation)
2006 International Union for the Study of Social Insects (oral communication)

Presented by others:

- 2009 Wang J, [Wurm Y](#), Harshman K, Xenarios I, Keller L. PILOT 1X SHORT-READ SEQUENCING OF *SOLENOPTIS INVICTA* USING THE ILLUMINA PLATFORM. *The Past, Present and Future of Ant Genomics*
- 2008 Nicolas M, Wang J, [Wurm Y](#), LaMendola C, Keller L, DEVELOPMENTAL TIME COURSE IN FIRE ANTS. *Society for Molecular Biology and Evolution*
- 2008 Wang J, Nicolas M, [Wurm Y](#), Keller L, DEVELOPMENTAL TIME COURSE OF METAMORPHOSIS IN FIRE ANTS. *International Union for the Study of Social Insects European Meeting*
- 2006 Wang J, Jemielity S, Uva P, [Wurm Y](#), Keller L, GENOMIC ANALYSIS OF ANT COLONY BEHAVIOR. *International Union for the Study of Social Insects Congress*

FURTHER EXPERIENCE

- Since 2010 Supervising one full-time laboratory technician for assembly validation
- Since 2009 Supervising two full-time bioinformaticians (one for genome assembly, one for R-based development of gene set analysis tools)
- 2008 Supervised one full-time bioinformatician for perl & web development of tools for ant EST assembly and annotation (including for <http://fourmidable.unil.ch>)
- Since 2003 Webmaster for a French watercolor artist <http://www.danielefraboulet.com>
- 2003-2007 Webmaster for a biotech startup <http://www.excellgene.com>
- 2002-2003 Website project leader for the INSA Biosciences department, <http://biosciences.insa-lyon.fr>
- 2002-2003 Twelve days with Apple Computer France: demonstrations of iPod, and how to make the most of UNIX and MacOS X software development tools
- Summer 2001 Work student at Aventis Pharma in Hoechst, Germany. Cell culture and software specification
- Summer 2000 Work student at Astrazeneca in Södertälje, Sweden. Data entry and laboratory work

TEACHING

- 2010 Supervision of P. Siguier's Masters project (24 weeks): SELECTION PRESSURE IN AN ANT GENOME
- 2009 Supervision of the bachelor's project of B. Laurency, P. Chatelain and B. Hurrell (programming in Python, visualising in R): CODON USAGE BIAS IN THE FIRE ANT, *SOLENOPSIS INVICTA*
- 2008-2009 Supervision of S. Büchel's Master's thesis: SELECTIVE DEATH AMONG FEMALE BROOD OF *SOLENOPSIS INVICTA*? The project required behavioral experiments, light lab work (PCRs and genotyping), and analyses using generalized linear models
- 2008 R FOR GENOMICS lecture given during the INTRODUCTION TO R course for graduate and post-graduate students of the Conférence Universitaire de Suisse Occidentale
- since 2006 Developing and teaching undergraduate practicals at Université de Lausanne (30 hours per year):
 BIOINFORMATICS: introductions to sequence characterization (using BLAST, web databases including Uniprot and protein structure modeling), comparative genomics (using ensembl and binding-site prediction), microarray analyses (using limma for analysis and point & click tools for clustering, visualisation and GO analyses)
 STATISTICS: probabilities, statistical tests, linear modeling, data manipulation in R
 EXPERIMENTAL DESIGN: analysing real data sets, designing experiments while taking statistical power and subsequent analyses into account

REFERENCES

- Prof. Ioannis Xenarios, Director, Uniprot & Vital-IT, Swiss Institute of Bioinformatics
 Prof. Laurent Keller, Director, Department of Ecology & Evolution, University of Lausanne
 Prof. Marc Robinson-Rechavi, Department of Ecology & Evolution, University of Lausanne
 Prof. Richard Roy, Department of Biology, McGill University

ADDITIONAL INFORMATION

Lived in France (9 years), the United States (9 years), Switzerland (5 years), Germany (5 years) and Canada (1 year)
 My English, French and German are thus fluent
 French & German citizenship
 Swiss "C" permit permanent residency

Reviewer for: Insect Molecular Biology
 BMC Evolutionary Biology

Member of: The International Union for the Study of Social Insects
 The Society for the Study of Evolution
 The Swiss Zoological Society
 Toastmasters International (Vice President Public Relations of the UNIL/EPFL club for 2007)

Interests: Saxophone (Jazz)
 Karate (Suisse Shotokan Karate black belt)
 Cycling & winter sports