

BIOSKETCH, ANDREAS WAGNER, 12/2016**PERSONAL INFORMATION**

Family name, First name: Wagner, Andreas

Date of birth: 26.1.1967

Nationality: Austria / U.S.A. (dual)

URL: <http://www.ieu.uzh.ch/wagner>

EDUCATION

1995 **Ph.D.**, Yale University, Dept. of Biology
 1994 **M. Phil.**, Yale University, Dept. of Biology
 1990 **M.Sc.**, Univ. of Vienna, Dept. of Molecular Genetics, "with honors"

CURRENT POSITIONS

2016- **Professor and Chairman**, Univ. of Zürich, Dept. of Evolutionary Biology and Environmental Studies, Zürich, Switzerland
 1999 - External Professor, The Santa Fe Institute, New Mexico, U.S.A.

PREVIOUS POSITIONS

2011- Professor (full), Univ. of Zürich, Dept. of Evolutionary Biology and Environmental Studies, Zürich, Switzerland
 2006-2010 Professor (full), Univ. of Zürich, Institute of Biochemistry
 2002-2012 Associate Professor (with tenure), Univ. of New Mexico, Department of Biology
 1998-2002 Assistant Professor, University of New Mexico, Department of Biology
 1996-1998 Postdoctoral Fellow, The Santa Fe Institute
 1995-1996 Fellow, Institute for Advanced Study Berlin, Germany

FELLOWSHIPS AND AWARDS

2014 Elected Member, European Molecular Biology Organization (EMBO)
 2011 Elected Fellow, American Association for the Advancement of Science
 2010 Gold medal for *Paradoxical Life*, best Science books of 2009, Independent Publisher Book Awards 2010
 2004- Member, Faculty of 1000 Biology
 1996-1998 Postdoctoral Fellowship, The Santa Fe Institute
 1995-1996 Fellow, Institute for Advanced Study (Wissenschaftskolleg) Berlin, Germany
 1995 J.S. Nicholas Prize for Best Dissertation, Yale University
 1994 G. Evelyn Hutchinson Prize, Yale University

SUPERVISION OF GRADUATE STUDENTS (23 total)

2006 - 19 Ph.D. students at the University of Zürich
 1998-2006 4 Ph.D. students at the University of New Mexico, Albuquerque, U.S.A.

SUPERVISION OF POSTDOCTORAL FELLOWS (18 total)

2006 - 16 postdocs at the University of Zürich
 1998-2006 2 postdocs. at the University of New Mexico, Albuquerque, U.S.A.

TEACHING (selected, out of 15 unique courses)

2013- Lecture and Laboratory Course "Evolution", Univ. of Zurich
 2013- Laboratory Course "Practical Bioinformatics", Univ. of Zurich,
 2008- Lecture Course "Functional Genomics", Univ. New Mexico (UNM)
 2007-2012 Lecture Course "Foundations of Molecular Evolution", UNM
 2004 Lecture Course "Evolution", UNM
 1999, 2000, 2001, 2003, 2006 Lecture Courses "Evolutionary Genetics", "Introductory Genetics", UNM
 1994 Laboratory Course, "Genetics", Yale University.

ORGANISATION OF SCIENTIFIC MEETINGS

- 2015-2016 Program committee, International Conference for Systems Biology (ICSB), Barcelona
 2014 Origins of novelty in biological, social, and technological systems, Santa Fe Institute, U.S.A
 2012 Robustness in biological systems, Mathematical Biology Institute, Ohio State Univ., U.S.A.

INSTITUTIONAL RESPONSIBILITIES

- 2016- Chairman, Dept. of Evolutionary Biology and Environmental Studies, Univ. Zürich
 2016- Faculty Senate (“Fakultätsausschuss”), Univ. Zürich
 2016- Teaching Committee, Faculty of Mathematics and Natural Sciences, Univ. Zürich
 2009- Steering Committee, Evolutionary Biology Ph.D. Program, Univ. Zürich
 2007-2016 Admission Committee, Computational Biology and Bioinformatics Master Program, ETH and Univ. Zürich
 2012- Steering Committee, Research Priority Program “Evolution in Action”, Univ. Zürich
 2007-2012 Steering Committee, Research Priority Program “Systems Biology”, Univ. Zürich
 2002-2004 Steering Committee, Center for Advanced Studies, Univ. of New Mexico
 1998-2001 Co-coordinator, Research program in “Evolutionary Dynamics”, The Santa Fe Institute

COMMISSIONS OF TRUST

- 2014- Science Advisory Board, The Santa Fe Institute, Santa Fe, NM, U.S.A.
 2013- Review Panel, Swiss National Science Foundation “Ambizione” Fellowship
 2010 Evaluation Panel, Center for Genomic Regulation (CRG), Barcelona
 2008, 2010 Jury member (as chair in 2010), Swiss Institute of Bioinformatics, Young Bioinformatician Award
 2003 Study Section, National Institute of Health, Centers of Excellence in Complex Biomedical Systems Research
 2004 Comité d'Evaluation laboratoire De Vienne, Gif-sur-Yvette, France
 2013-2016 Editorial Board, Genome Biology and Evolution
 2004-2013 Editorial Board, Bioessays
 2007-2011 Editorial Board, Molecular Genetics and Genomics
 2000-2008 Editorial Board, Advances in Complex Systems
 2004- Editorial Board, BMC Evolutionary Biology
 1999- Editorial Board, Journal of Experimental Zoology/Molecular and Developmental Evolution
 2007-2011 Editorial Board, Wiley Interdisciplinary Reviews: Systems Biology
 2010- Editorial Board, Philosophy and Theory in Biology
 2002- Editorial Board, Santa Fe Institute Publications
 1996-2016 Reviewer of 250+ papers and grant proposals for 45 journals and 14 funding agencies

MAJOR COLLABORATIONS (selected and last 5 years only, alphabetical)

1. Jaume Bertranpetit, Giovanni Dall’Olio “Genotype networks in human population genomics”, University of Pompeu Fabra, Barcelona, SPAIN
2. Tomàs-Marques Bonet, “Tandem repeats and the evolution of gene expression”, University of Pompeu Fabra, Barcelona, SPAIN
3. Jason Bragg, “Element sparing in the molecular evolution of proteins”, Australian National University, Canberra, AUSTRALIA
4. Bastien Chopard, Michel Milinkovitch “Systems biology of epithelial mechanics”, University of Geneva, SWITZERLAND
5. Mario Fares “Laboratory evolution of robustness in *E.coli*”, Trinity College, Dublin, IRELAND
6. Jose Lobo, Deborah Strumsky, “Delayed Success in Technological Evolution”, School of Sustainability, Arizona State University, Tempe, AZ, U.S.A.
7. Olivier Martin, “Sampling large genotype spaces”, University of Orsay, FRANCE
8. Areejit Samal, “Evolution of genome-scale metabolism”, Institute of Mathematical Sciences (IMSc), Chennai, INDIA
9. Uwe Sauer, Jörg Stelling “Systems biology of *Saccharomyces cerevisiae*”, ETH Zürich, SWITZERLAND
10. Eric Libby, Laurent Hebert-Dufresne, “Metabolism and the evolution of microbial consortia”, Santa Fe Institute, Santa Fe, N.M., U.S.A.

TEN YEAR SCIENTIFIC TRACK RECORD

Publication Summary

Total peer-reviewed publications in last ten years: 111 (out of 186 total)
 As senior (last) author: 70 of 111
 As first or sole author: 33 of 111
 Books: 3 (sole-authored)
 Total citations: 13492
 h-index: 57 (Google scholar)

10 Selected peer-reviewed publications (out of 186 total)

Aguilar Rodriguez, J., Payne, J.A., **Wagner, A.** (2017) 1000 empirical adaptive landscapes and their navigability. *Nature Ecology and Evolution* 1, 0045

Hayden, E., Bendixsen, D.P., **Wagner, A.** (2015) Intramolecular phenotypic capacitance in a modular RNA molecule. *Proceedings of the National Academy of Sciences* **112**, 12444-12449.

Bratulic, S., Gerber, F., **Wagner, A.** (2015) Mistranslation drives the evolution of robustness but not translational accuracy in TEM-1 β -lactamase. *Proceedings of the National Academy of Sciences* **112**, 12758-12763.

Payne, J.L., **Wagner, A.** (2014) The robustness and evolvability of transcription factor binding sites. *Science* **343**, 875-877.

Barve, A., **Wagner, A.** (2013) A latent capacity for evolutionary innovation through exaptation in metabolic systems. *Nature* **500**, 203-206.

Sunnaker, M., Zamora-Sillero, E., Dechant, R., Ludwig, C., Busetto, A.G., **Wagner, A.**, Stelling, J. (2013) Automatic generation of predictive dynamic models reveals nuclear phosphorylation as the key Msn2 control mechanism. *Science Signaling* **6**, ra41.

Barve, A., Rodrigues, J.F.M., **Wagner, A.** (2012) Superessential reactions in metabolic networks. *Proceedings of the National Academy of Sciences of the U.S.A.* **109** (18), E1121-E1130.

Hayden, E.J., Ferrada, E., **Wagner, A.** (2011) Cryptic genetic variation promotes rapid evolutionary adaptation in an RNA enzyme. *Nature* **474**, 92-95.

Espinosa-Soto, C., **Wagner, A.** (2010) Specialization can drive the evolution of modularity. *PLoS Computational Biology* **6**: e1000719.

Wagner, A. (2008) Robustness and evolvability: A paradox resolved. *Proc. Roy. Soc. London Series. B* **275**, 91-100.

Research Monographs

Wagner, A. (2011) *The Origins of Evolutionary Innovations*. Oxford University Press (147 citations).

Invited presentations (10 selected, out of 168 total)

2015 Keynote, LyonSysBio Systems Biology Conference, Villeurbanne, FRANCE

- 2014 Biotechnology Distinguished Speaker Series, Norwegian University of Science and Technology, Trondheim, NORWAY
- 2013 Keynote, FEBS Congress 2013, Bioinformatics Symposium, St. Petersburg, RUSSIA
- 2012 Department of Genetics, Harvard University, Boston, MA, U.S.A.
- 2011 Keynote, Mathematical Models in Ecology and Evolution 2011, Groningen, The NETHERLANDS
- 2010 Keynote, XXVII European Society for Biochemistry and Physiology (ESCBP) meeting, Alessandria, ITALY
- 2009 Keynote, 11th Annual Congress of the Italian Life Sciences Federation, Riva del Garda, ITALY
- 2009 Keynote, 60th Panhellenic Congress on Molecular Biology & Biochemistry, Athens, GREECE
- 2008 Keynote, Early career scientist symposium, University of Michigan, Ann Arbor, MI, U.S.A.
- 2006 Complex Systems Summer School, Beijing, CHINA

Organisation of international conferences

- 2015-2016 Program Committee, International Conference for Systems Biology (ICSB), Barcelona
- 2014 Conference “Origins of novelty in biological, social, and technological systems”, Santa Fe Institute, U.S.A
- 2012 Conference “Robustness in biological systems”, Mathematical Biology Institute, Ohio State Univ., U.S.A.

Awards and Academy memberships

- 2014 Elected Member, European Molecular Biology Organization (EMBO)
- 2011 Elected Fellow, American Association for the Advancement of Science
- 2010 Gold medal for *Paradoxical Life*, best science books of 2009, Independent Publisher Book Awards 2010

Media coverage

Our work and publications have received editorial and news coverage in multiple publications. They include scientific journals (*Science*, *Nature*, *P.N.A.S.*, *Genome Biology and Evolution*, *Lab Times*) but also prominent radio shows (*BBC World Service*, *BBC Radio 4 – Start The Week*, *Irish Newstalk*), as well as newspapers and magazines (*Times Higher Education*, *The Sunday Times*, *The Guardian*, *The Financial Times*, *die Süddeutsche Zeitung*, *BBC Wildlife*, *Wired Magazine*, *Forbes.com*, *Nautilus*, *the New Scientist*, *Aeon*, etc.)

Outreach

The central question in my lab’s research – how does the new come into being – is also of substantial interest to the general public. My first general audience book *Paradoxical Life* (Yale University Press 2009) has received a Gold medal as a “Best Science Book of 2009” by the Independent Publisher Book Awards, and a Silver medal as a “Best Philosophy Book of 2009” from Foreword Magazine. My most recent general audience book *Arrival of The Fittest* (Penguin Random House 2014) has been named a *Sunday Times* “Best Science Books of the Year”, and a *Financial Times* “Readers’ Books of the Year”. BBC Focus magazine referred to it as “mandatory, corrective reading...mind-bending... tremendously exciting”, and *The Independent*, which also listed it as a “Best Books of the Year” called it a “truly revolutionary book”.