OLIN SILANDER

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WORK EXPERIENCE & EDUCATION

Mar 2015-Present	**Senior Lecturer**, Massey University Auckland, New Zealand Institute of Natural and Mathematical Sciences
Nov 2009-Dec 2014	**Ambizione Fellow**, University of Basel, Switzerland Host: Prof. Erik van Nimwegen, Biozentrum, Computational and Systems Biology
Oct 2005-Oct 2009	**Postdoctoral Researcher**, ETH Zurich, Switzerland Advisor: Prof. Martin Ackermann, Institute of Integrative Biology
Sept 2000-Jul 2005	**PhD**, University of California, San Diego, USA Advisor: Dr. Lin Chao, Department of Ecology and Evolutionary Biology
Jan 1999-Sept 2000	**Technician,** Harvard University, Boston, USA PI: Dr. Cornelis Terhorst, Institutes of Medicine, Division of Immunology
Sept 1997-June 1998	**Student Researcher,** York University, England Advisor: Prof. Richard Law, Department of Biology
Sept 1994-June 1997	**Bachelor of Arts** (Honors), Northwestern University, Evanston, IL, USA Molecular Biology and Integrated Science

FUNDING

2015	*Single-cell analysis of bacterial responses to changing environments* Massey University Research Fund, PI, 20'000 NZD (15'000 USD)
2012-2014	*The genetic mechanisms underlying novel phenotypic functionality* SNF Ambizione renewal, PI, 290'000 CHF (310'000 USD)
2009-2012	*The generation of novel function in microbial systems* SNF Ambizione Fellowship, PI, 545'000 CHF (580'000 USD)

PROFESSIONAL ACTIVITES

Editorial	*Frontiers in Microbiology* (Review Editor)

Journal referee

The American Naturalist, BioEssays, BMC Evolutionary Biology, Environmental Science and Technology, Evolution, Heredity, ISME, The Journal of Bacteriology, The Journal of Theoretical Biology, Molecular Biology and Evolution, Nature, Nature Chemical Biology, PLOS Computational Biology, PLOS Genetics, PLOS One, PLOS Pathogens, Proceedings of the Royal Society B, Trends in Ecology and Evolution

Grant referee

Swiss National Science Foundation, National Science Foundation (USA), Canterbury Medical Research Foundation

Working groups

National Evolutionary Synthesis Center (USA):
Mathematical Models, Microbes & Evolutionary Diversification (2008-2010)

Kavli Institute for Theoretical Physics
Microbial and Viral Evolution (2010)

TEACHING

Graduate advisor

Michael Barnett (PhD student, co-advised with Paul Rainey, *May 2016 – present*))
Elena Denisenko (PhD student, co-advised with Sebastian Schmeier, *May 2016 – present*)
Richard Yulo (PhD student, co-advised with Heather Hendrickson, *June 2015 – present*)
Kelly Hong (Masters student, co-advised with Nikki Freed, *June 2015 – present*)

Previous:
Matthias Kaiser (PhD student, *May 2011 – May 2016*)
Luise Wolf (PhD student, *Nov 2009 – Dec 2013*)
Niels Hofsteenge (Masters student, *Aug 2010 – Aug 2012*)

Undergraduate teaching

2015-present	Principles of Genetics 203.212 (course coordinator)
2015-present	Advanced Genetics and Genomics 203.343 (course coordinator)
2015-present	Genetics and Evolution 203.341
2016-present	Evolutionary Biology 196.217
2009	Instructor, Swiss Institute for Bioinformatics Summer School

PUBLICATIONS

* indicates corresponding author(s)

Combining Shigella Tn-seq data with Gold-standard E. coli Gene Deletion Data Suggests Rare Transitions between Essential and Non-essential Gene Functionality
Freed NE, Bumann D, Silander OK*
bioRxiv (2016)

Expression noise facilitates the evolution of gene regulation
Wolf L, Silander OK*, van Nimwegen E*
eLife (2015)

Automated reconstruction of whole genome phylogenies from short sequence reads
Bertels F*, Silander OK, Pachkov M, Rainey P, van Nimwegen E
Molecular Biology and Evolution (2014)
[*MBE* news highlight (2014) 31: 1328]

The predictability of molecular evolution during functional innovation
Blank D, Wolf L, Ackermann M, Silander OK*
Proceedings of the National Academy of Sciences (2014) 111: 3044-3049
[highlighted in *Evolutionary Applications* (2014) 3: 337–338]

Quantitative analysis of persister fractions suggests different mechanisms of formation among environmental isolates of E. coli
Hofsteenge N, van Nimwegen E, Silander OK*
BMC Microbiology (2013) 13: 25

Opposite effects of KCTD subunit domains on $GABA_B$ receptor-mediated desensitization
Seddik R, Jungblut SP, Silander OK, Rajalu M, Fritzius T, Besseyrias V, Jacquier V, Fakler B, Gassmann M*, Bettler B*
Journal of Biological Chemistry (2012) 287: 39869

Patterns of evolutionary conservation of essential genes correlate with their compensability
Bergmiller T*, Ackermann M, Silander OK*
PLOS Genetics (2012) 8: e1002803

A genome-wide analysis of promoter-mediated phenotypic noise in Escherichia coli
Silander OK*, Nikolic N, Zaslaver A, Bren A, Kokoin I, Alon U, Ackermann M
PLOS Genetics (2012) 8: e1002443

Geographic differences in sexual reassortment in RNA phage
O'Keefe KJ, Silander OK, McCreery H, Weinreich DM, Wright KM, Chao L, Edwards SV, Remold SK, Turner PE*
Evolution (2010) doi: 10.1111/j.1558-5646.2010.01040

The constancy of gene conservation across divergent bacterial orders
Silander OK*, Ackermann M
BMC Research Notes (2009) 2:2

A simple screen to identify promoters conferring high levels of phenotypic variation
Freed NE, Silander OK, Stecher B, Boehm A, Hardt WD, Ackermann M*
PLOS Genetics (2008) 4: e1000307

Disruption of Esrom and Ryk identifies the roof plate boundary as an intermediate target for commisure formation
Hendricks M, Mathru AS, Hui W, Silander OK, Kee MZL, Jesuthasan S*
Molecular and Cellular Neuroscience (2008) 37: 271-283

Epistasis between deleterious mutations and the evolution of recombination
Kouyos R, Silander OK, Bonhoeffer S*
Trends in Ecology and Evolution (2007) 22: 308-315

Understanding the evolutionary fate of finite size populations: surviving deleterious mutations
Silander OK*, Tenaillon O, Chao L
PLOS Biology (2007) 5: e94
[highlighted in *Heredity* (2007) 99: 359–360]

Quantifying organismal complexity using a population genetics approach
Tenaillon O*, Silander OK, Uzan J-P, Chao L
PLOS One (2007) 2: e217

Widespread genetic exchange among terrestrial bacteriophages
Silander OK*, Weinreich DM, Wright KM, O'Keefe KJ, Rang CU, Turner PE, Chao L
Proceedings of the National Academy of Sciences (2005) 102: 19009-14

Alterations of the X-linked lymphoproliferative disease gene SH2D1A in common variable immunodeficiency syndrome
Morra M, Silander O, Calpe S, Choi M, Oettgen H, Myers L, Etzioni A, Buckley R, Terhorst C*
Blood (2001) 98: 1321-25

Characterization of SH2D1A missense mutations identified in X-linked lymphoproliferative disease patients
Morra M, Simarro-Grande M, Martin M, Chen ASI, Lanyi A, Silander O, Calpe S, Davis J, Pawson T, Eck MJ, Sumegi J, Engel P, Li SC, Terhorst C*
Journal of Biological Chemistry (2001) 276: 36809-16

INVITED TALKS

Selection on gene expression noise
University of Queensland, Brisbane, Australia (2015)

The Molecular Mechanisms of Functional Innovation in E. coli
University of Bern, Bern, Switzerland (2013)

The Molecular Mechanisms of Functional Innovation in E. coli
University of Geneva, Geneva, Switzerland (2013)

The Molecular Mechanisms of Functional Innovation in E. coli
IST Austria, Vienna, Austria (2012)

Phenotypic Evolution in E. coli
Swiss Tropical and Public Health Institute, Basel, Switzerland (2011)

The Evolution of Gene Expression Noise and Transcriptional Control in E. coli
EAWAG, ETH Zurich, Switzerland (2011)

Connecting Genotype to Phenotype: Insights from Phenotypic Changes in Bacteria
UC Irvine, California, USA (2011)

Connecting Genotype to Phenotype: Insights from Phenotypic Changes in Bacteria
University of Zurich Institute for Medical Microbiology, Zurich, Switzerland (2010)

The Consequences of New Genetic Variation: the Dynamics of Mutational Effects
UC Berkeley, CA, USA (2008)

The Consequences of New Genetic Variation: the Dynamics of Mutational Effects
Stanford University, Palo Alto, CA, USA (2008)

The Consequences of New Genetic Variation: the Dynamics of Mutational Effects
University of Chicago, IL, USA (2008)

Evolution in Small Populations: the Dynamics of Mutational Effects
University of Oregon, Eugene, OR, USA (2008)

The Determinants of Genomic Constraint
Uppsala University, Uppsala, Sweden (2007)