

CLAUS O. WILKE

Section of Integrative Biology,
Center for Computational Biology and Bioinformatics,
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The University of Texas at Austin
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Education

Ph.D. in Theoretical Physics Ruhr-Universität Bochum June 1999
Title: Evolutionary Dynamics in Time-Dependent Environments.
Adviser: Thomas Martinetz

Diplom in Theoretical Physics Ruhr-Universität Bochum Nov. 1996
(The German Diplom is comparable to a M.S.)

Employment

2011–present Associate Professor, The University of Texas at Austin
2005–2011 Assistant Professor, The University of Texas at Austin
2004–2005 Research Assistant Professor, Keck Graduate Institute
2003–2004 Senior Postdoctoral Scholar, California Institute of Technology
2000–2002 Postdoctoral Scholar, California Institute of Technology
1999 Postdoctoral Fellow, Medizinische Universität Lübeck, Germany
1996–1999 Research Assistant, Ruhr-Universität Bochum, Germany

Awards and Honors

2011–2014 Member of ICMB Advisory Committee and ICMB Fellowship, UT Austin
2011 Recognized as a *Leading Texas Innovator* by The Academy of Medicine,
Engineering, and Science of Texas
2010 College of Natural Sciences Teaching Excellence Award, UT Austin
2010/2011 ICMB Fellowship, UT Austin.
2007/2008 Reeder Centennial Fellowship in Systematic and Evolutionary Biology, UT Austin.
2003 Los Alamos National Laboratory Director's funded Postdoc (declined).
1999 *Ph.D.* in Theoretical Physics with Highest Honors
("Ausgezeichnet"), University of Bochum, Germany.
1996 *Diplom* in Theoretical Physics with Highest Honors
("Ausgezeichnet"), University of Bochum, Germany.
1996 Ruth and Gerd Massenberg award for excellence in physics,
University of Bochum, Germany.
1994/1995 Erasmus scholarship, University of Sussex.

Grants

Major federal grants are highlighted in bold face.

Current projects

7. **Associating growth conditions with cellular composition in Gram-negative bacteria. ARO 61789-MA-MUR. Claus Wilke (PI). Project period: 08/16/2012–08/15/2017. Total award amount: \$6,250,000.**
6. Evolutionary Genetics of Glioblastoma. Project sponsored by Neuro-Texas Institute to Claus Wilke, in support of 1 graduate research assistant/year. Project period: since 06/01/2011, no pre-specified end date. Total funds received to date: \$37,577.
5. Slow and steady wins the race? Adaptation in structured worlds. NSF DBI-0939454 subcontract*. Ben Kerr (PI). Project period: 06/01/2012–05/31/13; direct cost to Wilke lab: \$21,000. Role on project: PI of UT Subcontract.
4. Avida-ED Curriculum Development and Assessment Pilot Study. NSF DBI-0939454 subcontract*. Rob Pennock (PI). Project period: 06/01/2012–05/31/13; direct cost to Wilke lab: \$2,000. Role on project: PI of UT Subcontract.
3. Undergraduate Research Education in Computational Evolutionary Biology. NSF DBI-0939454 subcontract*. Arthur Covert (PI). Project period: 06/01/2012–05/31/13; direct cost to Wilke lab: \$40,000. Role on project: Senior Personnel.
2. **The biophysical basis of translational selection. NIH R01. Claus O. Wilke (MPI), D. Allan Drummond (MPI). Project period: 08/01/2009–05/31/2013; total award amount: \$1,014,666. Role on project: Communicating PI.**
1. Genetic determinants of adaptation of two flaviviruses. NIH R01. Laura D. Kramer (PI). Project period: 07/01/2009–06/30/2014; total award amount: \$1,600,000; direct cost to Wilke lab: approx. \$5000/year. Role on project: PI of UT subcontract.

*NSF DBI-0939454 subcontracts are one-year research projects awarded after open competition by the BEACON Center for the Study of Evolution in Action at MSU. The BEACON Center is funded by the NSF.

Completed projects

6. Undergraduate Research Education in Computational Evolutionary Biology. NSF DBI-0939454 subcontract*. Claus Wilke (PI). Project period: 06/01/2011–05/31/12; direct cost to Wilke lab: \$21,000.
5. Avida-ED Infrastructure Maintenance and Development. NSF DBI-0939454 subcontract*. Rob Pennock (PI). Project period: 06/01/2011–05/31/12; direct cost to Wilke lab: \$1,500. Role on project: PI of UT subcontract.
4. **Quasispecies network theories for the cross scale evolutionary dynamics of pathogens. NSF. Claus O. Wilke (PI). Project period: 03/01/2008–09/30/2012; total award amount: \$697,944. Role on project: PI (09/11–09/12), co-PI (03/09–08/11)**

3. Development of mathematical and simulation models that predict aspects of microbial adaptation. NSF DBI-0939454 subcontract*. Claus Wilke (PI). Project period: 08/01/2010–07/31/11; direct cost to Wilke lab: \$57,922.
2. Development of a realistic, genome-scale simulation model of protein evolution. University of Texas at Austin Summer Research Assignment. Claus O. Wilke (PI). Project period: 07/01/2007–09/30/2007; total award amount: \$21,500.
1. **Determinants of RNA virus evolution. NIH R01. Isabel Novella (PI). Project period: 06/15/2005–02/28/2010; total award amount: \$1,827,774; direct cost to Wilke lab: approx. \$60,000/year. Role on project: PI of UT subcontract.**

*NSF DBI-0939454 subcontracts are one-year research projects awarded after open competition by the BEACON Center for the Study of Evolution in Action at MSU. The BEACON Center is funded by the NSF.

University Service

- EEB Graduate Program Admissions Committee (2011–present)
- Option Representative for Computational Biology Option (2011–present)
- ICMB Advisory Committee (2011–2014)
- FRI Steering Committee (2011–present)
- Search Committee for IB Departmental Postdoc (2009–2010)
- Steering Committee for the Portfolio Program in Applied Statistical Modeling, (2008–present)

Professional Service

- Editorial activities:
 - Associate Editor, PLoS Comp. Biol. (2010–present)
 - Associate Editor, PLoS Pathogens (2010–present)
 - Section Editor, BMC Evol. Biol. (2010–2012)
 - Associate Editor, BMC Evol. Biol. (2009–2010)
 - Guest Editor, PLoS Comp. Biol. (2009–2010, 2 manuscripts)
 - Guest Editor, PLoS Pathogens (2009–2010, 5 manuscripts)
 - Guest Editor, PLoS Genetics (2008, 1 manuscript)
 - Member of Editorial Board, Biology Direct (2008–present)
 - Member of Editorial Board, BMC Evol. Biol. (2007–present)
 - Member of Editorial Board, Systematic Biology (2002–2004)
- Reviewer for funding agencies:
 - NSF, NIH, DTRA, ARO, Wellcome Trust
- Reviewer for scientific journals:
 - Nature, Science, PNAS, PLoS Biology, PLoS Computational Biology, Evolution, Genetics, Proceedings of the Royal Society B, Trends in Ecology and Evolution, Journal of Theoretical Biology, Journal of Virology, Nature Reviews Genetics, Systematic Biology, Physical Review Letters, Physical Review E, and others.

- Reviewer for conference proceedings:
Ninth International Conference on Artificial Life, September 2004, Boston, MA (ALIFE IX); Seventh European Conference on Artificial Life, September 2003, Dortmund, Germany (ECAL VII); Sixth European Conference on Artificial Life, September 2001, Prague, Czech Republic (ECAL VI); Seventh International Conference on Artificial Life, August 2000, Portland, OR (ALIFE VII).
- Conference organization:
 4. Track Chair, Evolution in Action track, 13th International Conference on the Simulation and Synthesis of Living Systems. BEACON Center, Michigan State University, July 19–22, 2012 (with S. Elena).
 3. Co-organizer of workshop “Evolution: From Atoms to Organisms” at the Aspen Center for Physics, Aspen, Colorado. August 10–31, 2008 (with E. Koonin and E. Shakhnovich).
 2. Co-organizer of “Workshop on Aspects of Self-Organization in Evolution”, Mathematical Biosciences Institute, Ohio State University, Columbus, Ohio. November 14–18, 2005 (with C. Adami).
 1. Co-organizer of “3rd German Workshop on Artificial Life 1998” (with S. Altmeyer and T. Martinetz).

Advisees

- Postdocs: Art Covert (since 08/2010), Tong Zhou (2006–2010), Allan Drummond (2006).
- Graduate students: Stefanie Spielman (EEB graduate program, ongoing), Dakota Derryberry (CMB graduate program, ongoing), Austin Meyer (Biochemistry graduate program, ongoing), Michael Scherrer (CMB graduate program, ongoing), Eamon O’Dea (EEB graduate program, ongoing, co-advised with Lauren Meyers), Thomas Keller (EEB graduate program, PhD 2012, co-advised with Jim Bull), Qing Qin (Masters in Statistics, spring 2012), Shujuan Feng (Masters in Statistics, fall 2009), Juan C. Santos (Masters in Statistics, fall 2009), Sijiong Mou (Masters in Statistics, summer 2009), Zhenyu Zhang (Masters in Statistics, summer 2007), Anna-Marie Christian (Masters in Statistics, spring 2007).
- Graduate students supervised informally*: Timothy Brennan (PhD 2011, Johns Hopkins University School of Medicine, adviser: Robert Siliciano), Ahmad Sedaghat (MD-PhD 2009, Johns Hopkins University School of Medicine, adviser: Robert Siliciano), Jesse Bloom (PhD 2007, Caltech, adviser: Frances Arnold), Allan Drummond (PhD 2006, Caltech, adviser: Frances Arnold), Robert Forster (PhD 2006, Caltech, adviser: Chris Adami), Stephanie Chow (PhD 2005, Caltech, adviser: Chris Adami).

*During their graduate career, each of these students wrote at least one paper that was primarily supervised by me.

- Undergraduates**: Eric Dawson (2012–present), Jared Carlson-Stevermer (2011–present), Mathew Tien (2011–2012), David Mis (2010–present), Kevin Jia (2010–2011), Evan Koch (2009–2011), Shelby Steinmeyer (2008–2010), Jialan Wang (2000–2001).

**I frequently involve undergraduates in research. This list only includes students whose work has produced publishable results.

Teaching Experience

- Computational Biology (undergraduate level). University of Texas at Austin, spring 2010.
- Biostatistics (undergraduate level). University of Texas at Austin, spring 2006, 2007, 2008, 2009; fall 2010, 2011, 2012.
- Scientific Writing for Biologists (graduate level). University of Texas at Austin, fall 2007, 2008; spring 2012.
- Molecular Evolution (graduate level). University of Texas at Austin, fall 2006.
- Statistical methods in bioinformatics (graduate level). Keck Graduate Institute and Claremont Graduate University, fall 2004/ spring 2005 (taught jointly with A. Raval)

Publications

Articles currently under review

5. S. J. Spielman and C. O. Wilke. Membrane environment imposes unique selection pressures on transmembrane domains of G protein-coupled receptors. Submitted to *J. Mol. Evol.*
4. I. S. Novella, J. P. Presloid, C. Beech, and C. O. Wilke. Congruent evolution of fitness and genetic robustness in VSV. Submitted to *J. Virol.*
3. S. D. Smith-Tsurkan, R. H. Herr, S. Khuder, C. O. Wilke, and I. S. Novella. The role of environmental complexity on the evolution of phenotypic diversity in viral populations. Submitted to *J. Gen. Virol.*
2. A. R. Sedaghat, S. T. Gray, K. Chambers, C. O. Wilke, and D. S. Caradonna. Sinonasal anatomic variants and asthma are associated with faster development of chronic rhinosinusitis in patients with allergic rhinitis. Submitted to *Int. Forum Allergy Rhinol.*
1. E. B. O'Dea, K. M. Pepin, B. A. Lopman, and C. O. Wilke. Joint estimation of transmission rate and number of susceptibles with data aggregated from multiple norovirus outbreaks. Submitted to *Epidemics*.

Peer-reviewed journal articles

97. A. G. Meyer, E. T. Dawson, and C. O. Wilke. Cross-species comparison of site-specific evolutionary-rate variation in influenza hemagglutinin. *Phil. Trans. R. Soc. B*, in press.
96. A. G. Meyer and C. O. Wilke. Integrating sequence variation and protein structure to identify sites under selection. *Mol. Biol. Evol.*, in press.
95. M. P. Scherrer, A. G. Meyer, and C. O. Wilke. Modeling coding-sequence evolution within the context of residue solvent accessibility. *BMC Evol. Biol.* 12:179, 2012.
94. J. J. Bull, I. J. Molineux, and C. O. Wilke. Slow fitness recovery in a codon-modified viral genome. *Mol. Biol. Evol.* 29:2997–3004, 2012.
93. A. R. Sedaghat, S. T. Gray, C. O. Wilke, and D. S. Caradonna. Risk factors for development of chronic rhinosinusitis in patients with allergic rhinitis. *Int. Forum Allergy Rhinol.* 2:370–375, 2012.

92. T. E. Keller, C. O. Wilke and J. J. Bull. Interactions between evolutionary processes at high mutation rates. *Evolution* 66:2303-2314, 2012.
91. T. E. Keller, S. D. Mis, K. E. Jia, and C. O. Wilke. Reduced mRNA secondary-structure stability near the start codon indicates functional genes in prokaryotes. *Genome Biol. Evol.* 4:80–88, 2012.
90. D. Wang, M. K. Markey, C. O. Wilke, and A. Arapostathis. Eigen-genomic system dynamic pattern analysis (ESDA): Modeling mRNA degradation and self-regulation. *IEEE/ACM Trans. Comp. Biol. Bioinf.* 9:430–437, 2012.
89. D. Wang, A. Arapostathis, C. O. Wilke, and M. K. Markey. Principal-oscillation-pattern analysis of gene expression. *PLoS ONE* 7:e28805, 2012.
88. I. S. Novella, J. B. Presloid, S. D. Smith, and C. O. Wilke. Specific and nonspecific host adaptation during arboviral experimental evolution. *J. Mol. Microbiol. Biotech.* 21:71-81, 2012.
87. J. J. Bull, R. H. Heineman, and C. O. Wilke. The phenotype-fitness map in experimental evolution of phages. *PLoS ONE* 6:e27796, 2011.
86. A. R. Sedaghat and C. O. Wilke. Kinetics of the viral cycle influence pharmacodynamics of antiretroviral therapy. *Biology Direct* 6:42, 2011.
85. D. C. Ramsey, M. P. Scherrer, T. Zhou, and C. O. Wilke. The Relationship Between Relative Solvent Accessibility and Evolutionary Rate in Protein Evolution. *Genetics* 188:479–488, 2011.
84. A. Spivak, A. Rabi, M. A. McMahon, L. Shan, A. R. Sedaghat, C. O. Wilke, R. Siliciano. Dynamic Constraints on the Second Phase Compartment of HIV-infected Cells. *AIDS Res. Hum. Retroviruses* 27:759–761, 2011.
83. T. Zhou and C. O. Wilke. Reduced stability of mRNA secondary structure near the translation-initiation site in dsDNA viruses. *BMC Evol. Biol.* 11:59, 2011.
82. A. T. Ciota, E. M. Koch, G. G. Willsey, L. J. Davis, G. V. S. Jerzak, D. J. Ehrbar, C. O. Wilke, and L. D. Kramer. Temporal and spatial alterations in mutant swarm size of St. Louis encephalitis virus in mosquito hosts. *Infection, Genetics and Evolution* 11:460–468, 2011.
81. E. B. O’Dea and C. O. Wilke. Contact heterogeneity and phylodynamics: How contact networks shape parasite evolutionary trees. *Interdiscip. Persp. Inf. Dis.* 2011:238743, 2011.
80. Y. Lee, T. Zhou, G. G. Tartaglia, M. Vendruscolo, and C. O. Wilke. Translationally optimal codons associate with aggregation-prone sites in proteins. *Proteomics* 10:4163-4171, 2010.
79. K. Pepin, I. Volkov, J. R. Banavar, C. O. Wilke, and B. T. Grenfell. Phenotypic differences in viral immune-escape explained by linking within-host dynamics to host-population immunity. *J. Theor. Biol.* 265:501–510, 2010.
78. E. B. O’Dea, T. E. Keller, and C. O. Wilke. Does mutational robustness inhibit extinction by lethal mutagenesis in viral populations? *PLoS Comp. Biol.* 6:e1000811, 2010.
77. T. Zhou, W. Gu, and C. O. Wilke. Detecting positive and purifying selection at synonymous sites in yeast and worm. *Mol. Biol. Evol.* 27:1912–1922, 2010.

76. C. O. Wilke and D. A. Drummond. Signatures of protein biophysics in coding sequence evolution. *Curr. Opin. Struct. Biol.* 20:385-389, 2010.
75. A. R. Sedaghat, D. A. Rastegar, K. A. O'Connell, J. B. Dinoso, C. O. Wilke, and J. N. Blankson. Is it time to treat HIV elite controllers with combined antiretroviral therapy? - Reply. *Clinical Infectious Diseases* 50:1425-1426, 2010.
74. S. H. Steinmeyer, C. O. Wilke, and K. M. Pepin. Methods of modeling viral disease dynamics across the within- and between-host scales: The impact of virus dose on host population immunity. *Phil. Trans. R. Soc. B* 365:1931-1941, 2010.
73. I. S. Novella, J. B. Presloid, T. Zhou, S. D. Smith-Tsurkan, B. E. Ebendick-Corpus, R. N. Dutta, K. L. Lust, and C. O. Wilke. Genomic evolution of vesicular stomatitis virus strains with differences in adaptability. *J. Virol.* 84:4960-4968, 2010.
72. S. D. Smith-Tsurkan, C. O. Wilke, and I. S. Novella. Incongruent fitness landscapes, not tradeoffs, dominate the adaptation of VSV to novel host types. *J. Gen. Virol.* 91:1484-1493, 2010.
71. W. Gu, T. Zhou, and C. O. Wilke. A universal trend of reduced mRNA stability near the translation-initiation site in prokaryotes and eukaryotes. *PLoS Comput. Biol.* 6:e1000664, 2010.
70. D. A. Drummond and C. O. Wilke. The evolutionary consequences of erroneous protein synthesis. *Nature Reviews Genetics* 10:715-724, 2009.
69. A. R. Sedaghat, D. A. Rastegar, K. A. O'Connell, J. B. Dionso, C. O. Wilke, and J. N. Blankson. T cell dynamics and the response to HAART in a cohort of HIV-1 infected elite suppressors. *Clin. Inf. Diseases* 49:1763-1766, 2009.
68. S. H. Steinmeyer and C. O. Wilke. Lethal mutagenesis in a structured environment. *J. Theor. Biol.* 261:67-73, 2009.
67. T. P. Brennan, J. O. Woods, A. R. Sedaghat, J. D. Siliciano, R. F. Siliciano, and C. O. Wilke. Analysis of HIV-1 viremia and provirus in resting CD4+ T cells reveals a novel source of residual viremia in patients on antiretroviral therapy. *J. Virol.* 83:8470-8481, 2009.
66. T. Zhou, M. Weems, and C. O. Wilke. Translationally optimal codons associate with structurally sensitive sites in proteins. *Mol. Biol. Evol.* 26:1571-1580, 2009.
65. A. R. Sedaghat, R. F. Siliciano, and C. O. Wilke. Constraints on the dominant mechanism for HIV viral dynamics in patients on raltegravir. *Antiviral Therapy* 14:263-271, 2009.
64. T. Zhou, P. J. Enyeart, and C. O. Wilke. Detecting Clusters of Mutations. *PLoS ONE* 3:e3765, 2008.
63. I. S. Novella, R. N. Dutta, and C. O. Wilke. A linear relationship between fitness and log critical bottleneck size in vesicular stomatitis virus. *J. Virol.* 82:12589-12590, 2008.
62. J. J. Bull and C. O. Wilke. Lethal mutagenesis of bacteria. *Genetics* 180:1061-1070, 2008.
61. D. A. Drummond and C. O. Wilke. Mistranslation-induced protein misfolding as a dominant constraint on coding-sequence evolution. *Cell* 134:341-352, 2008.
60. D. J. Whitehead*, C. O. Wilke*, D. Vernazobres, and E. Bornberg-Bauer. The look-ahead effect of phenotypic mutations. *Biology Direct* 3:18, 2008. *Equal contribution.

59. É. Brunet, I. M. Rouzine, and C. O. Wilke. The stochastic edge in adaptive evolution. *Genetics* 179:603–620, 2008.
58. T. Zhou, D. A. Drummond, and C. O. Wilke. Contact density affects protein evolutionary rate from bacteria to animals. *J. Mol. Evol.* 66:395–404, 2008.
57. R. N. Dutta, I. M. Rouzine, S. D. Smith, C. O. Wilke, and I. S. Novella. Rapid adaptive amplification of preexisting variation in an RNA virus. *J. Virol.* 82:4354–4362, 2008.
56. A. R. Sedaghat, J. B. Dinoso, L. Shen, C. O. Wilke, and R. F. Siliciano (2008). Decay dynamics of HIV-1 depend on the inhibited stages of the viral life cycle. *Proc. Natl. Acad. Sci. USA* 105:4832–4837, 2008.
55. I. M. Rouzine, E. Brunet, and C. O. Wilke. The traveling wave approach to asexual evolution: Muller’s ratchet and speed of adaptation. *Theor. Popul. Biol.* 73:24–46, 2008.
54. A. R. Sedaghat, R. F. Siliciano, and C. O. Wilke. Low-level HIV-1 replication and the dynamics of the resting CD4⁺ T cell reservoir for HIV-1 in the setting of HAART. *BMC Infect. Dis.* 8:2, 2008.
53. A. R. Sedaghat, J. D. Siliciano, T. P. Brennan, C. O. Wilke, and R. F. Siliciano. Limits on replenishment of the resting CD4⁺ T cell reservoir for HIV in patients on HAART. *PLoS Pathogens* 3:e122, 2007.
52. R. Forster and C. O. Wilke. Frequency-dependent selection in a periodic environment. *Physica A* 381:255–264, 2007.
51. J. J. Bull, R. Sanjuán, and C. O. Wilke. Theory of lethal mutagenesis for viruses. *J. Virol.* 81:2930–2939, 2007.
50. S. F. Elena, C. O. Wilke, C. Ofria, and R. E. Lenski. Effects of population size and mutation rate on the evolution of mutational robustness. *Evolution* 61:666–674, 2007.
49. J. D. Bloom, A. Raval, and C. O. Wilke. Thermodynamics of neutral protein evolution. *Genetics* 175:255–266, 2007.
48. R. Foster, C. Adami, and C. O. Wilke. Selection for mutational robustness in finite populations. *J. Theor. Biol.* 243:181–190, 2006.
47. J. D. Bloom, D. A. Drummond, F. H. Arnold, and C. O. Wilke. Structural determinants of the rate of protein evolution in yeast. *Mol. Biol. Evol.* 23:1751–1761, 2006.
46. J. R. Bailey, A. R. Sedaghat, T. Kieffer, T. Brennan, P. K. Lee, M. Wind-Rotolo, C. M. Haggerty, A. R. Kamireddi, Y. Liu, J. Lee, D. Persaud, J. E. Gallant, J. Cofrancesco, Jr., T. C. Quinn, C. O. Wilke, S. C. Ray, J. D. Siliciano, R. E. Nettles, and R. F. Siliciano. Residual human immunodeficiency virus type 1 viremia in some patients on antiretroviral therapy is dominated by a small number of invariant clones rarely found in circulating CD4⁺ T cells. *J. Virol.* 80:6441–6457, 2006.
45. C. O. Wilke and D. Allan Drummond. Population genetics of translational robustness. *Genetics* 173:473–481, 2006.
44. D. A. Drummond, A. Raval, and C. O. Wilke. A single determinant dominates the rate of yeast protein evolution. *Mol. Biol. Evol.* 23:327–337, 2006.

43. C. O. Wilke, R. Forster, and I. S. Novella. Quasispecies in time-dependent environments. *Curr. Topics Microbiol. Immun.* 299:33-50, 2006.
42. R. Forster and C. O. Wilke. Tradeoff between short-term and long-term adaptation in a changing environment. *Phys. Rev. E* 72:041922, 2005.
41. C. O. Wilke, J. D. Bloom, D. A. Drummond, and A. Raval. Predicting the tolerance of proteins to random amino acid substitution. *Biophys. J.* 89:3714-3720, 2005.
40. D. A. Drummond, J. D. Bloom, C. Adami, C. O. Wilke, and F. H. Arnold. Why highly expressed proteins evolve slowly. *Proc. Natl. Acad. Sci. USA* 102:14338-14343, 2005.
39. C. O. Wilke. Quasispecies theory in the context of population genetics. *BMC Evol. Biol.* 5:44, 2005.
38. D. A. Drummond, J. J. Silberg, M. M. Meyer, C. O. Wilke, and F. H. Arnold. On the conservative nature of intragenic recombination. *Proc. Natl. Acad. Sci. USA* 102:5380-5385, 2005.
37. J. D. Bloom, J. J. Silberg, C. O. Wilke, D. A. Drummond, C. Adami, and F. H. Arnold. Thermodynamic prediction of protein neutrality. *Proc. Natl. Acad. Sci. USA* 102:606-611, 2005.
36. C. O. Wilke. Molecular clock in neutral protein evolution. *BMC Genetics* 5:25, 2004.
35. S. S. Chow*, C. O. Wilke*, C. Ofria, R. E. Lenski, and C. Adami. Adaptive radiation from resource competition in digital organisms. *Science* 305:84-86, 2004. *Equal contribution.
34. R. Froissart, C. O. Wilke, R. Montville, S. K. Remold, L. Chao, and P. E. Turner. Co-infection weakens selection against epistatic mutations in RNA viruses. *Genetics* 168:9-19, 2004.
33. C. O. Wilke. The speed of adaptation in large asexual populations. *Genetics* 167:2045-2053, 2004.
32. I. S. Novella, D. D. Reissig, and C. O. Wilke. Density-dependent selection in vesicular stomatitis virus. *J. Virol.* 78:5799-5804, 2004.
31. J. D. Bloom, C. O. Wilke, F. H. Arnold, and C. Adami. Stability and the evolvability of function in a model protein. *Biophys. J.* 86:2758-2764, 2004.
30. C. O. Wilke, D. D. Reissig, and I. S. Novella. Replication at periodically changing multiplicity of infection promotes stable coexistence of competing viral populations. *Evolution* 58:900-905, 2004.
29. C. Adami and C. O. Wilke. Experiments in Evolution. *Artificial Life* 10:117-122, 2004.
28. Y. Li and C. O. Wilke. Digital Evolution in Time-Dependent Fitness Landscapes. *Artificial Life* 10:123-134, 2004.
27. T. J. Johnson and C. O. Wilke. Evolution of Resource Competition Between Mutually Dependent Digital Organisms. *Artificial Life* 10:145-156, 2004.
26. C. Ofria and C. O. Wilke. Avida: A Software Platform for Research in Computational Evolutionary Biology. *Artificial Life* 10:191-229, 2004.
25. C. O. Wilke and I. S. Novella. Phenotypic mixing and hiding may contribute to memory in viral quasispecies. *BMC Microbiology* 3:11, 2003.

24. C. O. Wilke. Does the Red Queen reign in the kingdom of digital organisms? *Lect. Notes Artif. Int.* 2801:405–414, 2003.
23. C. O. Wilke. Probability of fixation of an advantageous mutant in a viral quasispecies. *Genetics* 163:457–466, 2003.
22. C. O. Wilke, R.E. Lenski, and C. Adami. Compensatory mutations cause excess of antagonistic epistasis in RNA secondary structure folding. *BMC Evolutionary Biology* 3:3, 2003.
21. C. O. Wilke and C. Adami. Evolution of mutational robustness. *Mut. Res.* 522:3–11, 2003.
20. C. Kamp, C. O. Wilke, C. Adami and S. Bornholdt. Viral evolution under the pressure of an adaptive immune system – optimal mutation rates for viral escape. *Complexity* 8:28–33, 2002.
19. C. O. Wilke and C. Adami. The biology of digital organisms. *Trends Ecol. Evol.* 17:528–532, 2002.
18. C. O. Wilke, P.R.A. Campos, and J.F. Fontanari. The genealogical process in a correlated fitness landscape. *J. exp. Zool. (Mol. Dev. Evol.)* 294:274–284, 2002.
17. C. O. Wilke. Maternal effects in molecular evolution. *Phys. Rev. Lett.*, 88:078101, 2002.
16. P.R.A. Campos, C. Adami, and C. O. Wilke. Optimal adaptive performance and delocalization in NK fitness landscapes. *Physica A* 304:177–188, 2002.
15. C. O. Wilke. Selection for fitness vs. selection for robustness in RNA secondary structure folding. *Evolution*, 55:2412–2420, 2001.
14. C. O. Wilke, J. L. Wang, C. Ofria, R. E. Lenski, and C. Adami. Evolution of digital organisms at high mutation rate leads to survival of the flattest. *Nature*, 412:331–333, 2001.
13. C. O. Wilke. Adaptive evolution on neutral networks. *Bull. Math. Biol.*, 63:715–730, 2001.
12. C. O. Wilke and C. Adami. Interaction between directional epistasis and average mutational effects. *Proc. R. Soc. London B*, 268:1469–1474, 2001.
11. C. O. Wilke, C. Ronnewinkel and T. Martinetz. Dynamic fitness landscapes in molecular evolution. *Phys. Rep.*, 349:395–446, 2001.
10. C. O. Wilke and C. Ronnewinkel. Dynamic fitness landscapes: Expansions for small mutation rates. *Physica A*, 290:475–490, 2001.
9. C. O. Wilke. Dynamische Fitnesslandschaften. *KI*, 14:20–25, 2000 (in german).
8. C. O. Wilke and T. Martinetz. Adaptive walks on time-dependent fitness landscapes. *Phys. Rev. E*, 60:2154–2159, 1999.
7. C. O. Wilke, C. Ronnewinkel, and T. Martinetz. Molecular Evolution in Time Dependent Environments. *Lect. Notes Artif. Int.*, 1674:417–421, 1999.
6. C. O. Wilke and T. Martinetz. Lifetimes of agents under external stress. *Phys. Rev. E Rapid Communications*, 59:R2512–R2515, 1999.
5. C. Wilke and T. Martinetz. Hierarchical noise in large systems of independent agents. *Phys. Rev. E*, 58:7101–7108, 1998.

4. C. Wilke, S. Altmeyer, and T. Martinetz. Aftershocks in Coherent-Noise Models. *Physica D*, 120:401–417, 1998.
3. C. Wilke and T. Martinetz. Simple model of evolution with variable system size. *Phys. Rev. E*, 56:7128–7131, 1997.
2. M. Kachelrieß, C. Wilke, and G. Wunner. Axion cyclotron emissivity of magnetized white dwarfs and neutron stars. *Phys. Rev. D*, 56:1313–1319, 1997.
1. C. Wilke and G. Wunner. Photon splitting in strong magnetic fields: asymptotic approximation formulae vs. accurate numerical results. *Phys. Rev. D*, 55:997–1000, 1997.

Book chapters

9. A. W. Covert, J. Carlson-Stevermer, D. Z. Derryberry, and C. O. Wilke. The role of deleterious mutations in the adaptation to a novel environment. In C. Adami, D. M. Bryson, C. Ofria and R. T. Pennock, eds., *Proceedings of the 13th International Conference on the Simulation and Synthesis of Living Systems*, pp. 27–31, MIT Press 2012.
8. A. W. Covert, L. Smith, D. Z. Derryberry, and C. O. Wilke. What does sex have to do with it: tracking the fate of deleterious mutations in sexual populations. In C. Adami, D. M. Bryson, C. Ofria and R. T. Pennock, eds., *Proceedings of the 13th International Conference on the Simulation and Synthesis of Living Systems*, pp. 32–36, MIT Press 2012.
7. J. J. Bull, R. Sanjuán, and C. O. Wilke. Lethal mutagenesis. In E. Domingo, C. R. Parrish, and J. J. Holland, eds., *Origin and Evolution of Viruses*, 2nd ed., pp. 207–218, Elsevier 2008.
6. C. Ofria and C. O. Wilke. Avida: Evolution experiments with self-replicating computer programs. In: A. Adamatzky and M. Komosinski, eds. *Artificial Life Models in Software*, Springer 2006.
5. C. O. Wilke and S. S. Chow. Exploring the evolution of ecosystems with digital organisms. In: M. Pascual and J. Dunne, eds. *Ecological Networks: Linking Structure to Dynamics in Food Webs*, Oxford University Press 2006.
4. P. R. A. Campos, C. Adami, and C. O. Wilke. Modelling stochastic clonal interference. In G. Ciobanu and G. Rozenberg, eds., *Modelling in Molecular Biology*, pp. 21-39, Springer Series in Natural Computing, 2004.
3. C. Ronnewinkel, C. O. Wilke and T. Martinetz. Genetic algorithms in time-dependent environments. In L. Kallel, B. Naudts and A. Rogers, editors, *Theoretical Aspects of Evolutionary Computing*, pp. 261–285, Natural Computing, Springer Verlag 2001.
2. C. Wilke, S. Altmeyer, and T. Martinetz. Large-scale evolution and extinction in a hierarchically structured environment. In C. Adami, R. Belew, H. Kitano, and C. Taylor, editors, *Proc. of “Artificial Life VI”*, Los Angeles, June 26-29, MIT Press 1998.
1. S. Altmeyer, C. Wilke, and T. Martinetz. How fast do structures emerge in hypercycle systems? In C. Wilke, S. Altmeyer, and T. Martinetz, editors, *Third German Workshop on Artificial Life*, Verlag Harri Deutsch 1998.

Editorial material

6. C. O. Wilke. Bringing molecules back into molecular evolution. *PLoS Comp. Biol.* 8:e1002572, 2012.
5. C. O. Wilke. Transcriptional robustness complements nonsense-mediated decay in humans. *PLoS Genet.* 7:e1002296, 2011.
4. J. D. Bloom, F. H. Arnold, and C. O. Wilke. Breaking proteins with mutations: threads and thresholds in evolution. *Mol. Syst. Biol.* 3:76, 2007.
3. C. O. Wilke. Biology through the robustness lens. *BioScience* 56:695–696, 2006.
2. C. O. Wilke. The heavy, the cold and the slow. *Heredity* 95:115, 2005.
1. C. O. Wilke. Supplementary materials need the right format. *Nature* 430:291, 2004.

Books

2. C.O. Wilke. *Evolutionary Dynamics in Time-Dependent Environments*. Shaker Verlag, Aachen, 1999. ISBN 3-8265-6199-6. (PhD Thesis, Ruhr-Universität Bochum)
1. C. Wilke, S. Altmeyer, and T. Martinetz, editors. *Third German Workshop on Artificial Life*. Verlag Harri Deutsch, Thun, Frankfurt a.M., 1998. ISBN 3-8171-1591-1.

Conference presentations and seminar talks

84. Seminar talk. Department of Zoology, Oxford University, Oxford, UK. Oct. 23, 2012.
83. Seminar talk. Department of Infectious Disease Epidemiology, Imperial College, London, UK. Oct. 22, 2012.
82. Seminar talk. Laufer Center, SUNY Stony Brook. Stony Brook, NY. Aug. 28, 2012.
81. Poster with A. G. Meyer. Annual meeting of the Society for Molecular Biology and Evolution, Dublin, Ireland. June 23–26, 2012.
80. Invited talk. Royal Society Satellite Meeting “Next-generation molecular and evolutionary epidemiology of infectious disease: challenges and opportunities,” The Kavli Royal Society International Centre, Buckinghamshire, UK. May 16–17, 2012.
79. Seminar talk. Wadsworth Center, NY State Dept. Health, Albany, NY. April 5, 2012.
78. Seminar talk. McMaster University, Hamilton, ON, Canada. March 5, 2012.
77. Seminar talk. Trinity University, San Antonio, TX. Feb. 28, 2012.
76. Invited talk. First Annual Austin Translational Neuroscience Symposium, Austin, TX. April 2, 2011.
75. Invited talk. March meeting of the American Physical Society, Dallas, TX. March 21–25, 2011.
74. Invited talk. KITP workshop “Microbial and Viral Evolution”, Santa Barbara, CA. Mar. 8, 2011.
73. Invited talk. KITP workshop “Microbial and Viral Evolution”, Santa Barbara, CA. Feb. 23, 2011.

72. Bauer Forum, FAS Center for Systems Biology, Harvard University. Oct. 22, 2010.
71. Seminar talk. Bioinformatics Program, Boston University. Oct. 21, 2010.
70. Invited talk. FASEB Summer Research Conference “Protein Folding in the Cell”, Saxtons River, Vermont. July 25-30, 2010.
69. Seminar talk. BioMaPS Institute for Quantitative Biology, Rutgers University, Piscataway, NJ. April 9, 2010.
68. Seminar talk. IST Austria, Vienna, Austria. March 23, 2010.
67. Seminar talk. Michigan State University, East Lansing, MI. Jan. 15, 2010.
66. Invited talk. MPG workshop “Physical Principles of Protein Behavior in the Cell”, Dresden, Germany. Oct. 26–30, 2009.
65. Invited talk. CNRS Jacques Monod Conference “Understanding emergence of infectious diseases”, Roscoff, France. Sep. 26–30, 2009.
64. Seminar talk. Department of Biology & Biochemistry, University of Houston. Sep. 9, 2009.
63. Poster with T. P. Brennan, J. O. Woods, A. R. Sedaghat, and R. F. Siliciano. Annual Meeting of the Society of Molecular Biology and Evolution, Iowa City, Iowa. June 3–7, 2009.
62. Poster with T. Zhou and M. Weems. Annual Meeting of the Society of Molecular Biology and Evolution, Iowa City, Iowa. June 3–7, 2009.
61. Seminar talk. NCBI. May 8, 2009.
60. Poster with T. P. Brennan, J. O. Woods, A. R. Sedaghat, and R. F. Siliciano. Conference on Retroviruses and Opportunistic Infections (CROI), Palais de Congres, Montreal, Canada. February 8–11, 2009.
59. Seminar talk. Lewis-Sigler Institute for Integrative Genomics, Princeton University. Feb. 9, 2009.
58. Seminar talk. Center for Infectious Disease Dynamics, Penn State University. Jan. 30, 2009.
57. Seminar talk. Dept. of Biomathematics, UCLA. Dec 4, 2008.
56. Invited talk. EMBL conference “Evolutionary and Environmental Genomics of Yeasts”, Heidelberg, Germany. October 1–5, 2008.
55. Talk. Workshop “Evolution: From Atoms to Organisms”, Aspen Center for Physics, Aspen, CO. August 10–31, 2008.
54. Invited talk. CIDD Workshop: Virus adaptation on multi-host fitness landscapes, Penn State University, State College, PA. July 17, 2008.
53. Poster with T. Zhou. Annual Meeting of the Society of Molecular Biology and Evolution, Barcelona, Spain. June 5–8, 2008.
52. Seminar talk. Bauer Forum, FAS Center for Systems Biology, Harvard University, Boston, MA. March 21, 2008.
51. Seminar talk. Population Biology, Evolution, and Ecology, Emory University, Atlanta, GA. October 26, 2007.

50. Seminar talk. Institute for Evolution and Biodiversity, The Westfalian Wilhelms University of Münster, Germany. June 20, 2007.
49. Invited talk. IPL workshop Genes, Infections and Epidemics, Wageningen, the Netherlands. June 13–June 15, 2007.
48. Seminar talk. Keck Graduate Institute for Applied Life Sciences, Claremont, CA. May 18, 2007.
47. Seminar talk. Dept. of Molecular Biology and Genetics, Johns Hopkins University School of Medicine, Baltimore, MD. March 30, 2007.
46. Seminar talk. Dept. of Biology, Georgia Institute of Technology, GA. November 20, 2006.
45. Seminar talk. Center for Nonlinear Dynamics, University of Texas at Austin, TX. September 25, 2006.
44. Invited talk. CIPRES Mini-Symposium on Evolutionary Simulation, Philadelphia, PA. March 31–April 1, 2006.
43. Invited talk. MBI workshop on “Aspects of Self-Organization in Evolution”, Columbus, Ohio. Nov. 14–18, 2005.
42. Poster with D. A. Drummond, J. D. Bloom, C. Adami, F. H. Arnold. Gordon Conference on Structural, Functional & Evolutionary Genomics, Bates College, Lewiston, ME. June 19–24, 2005.
41. Poster with D. A. Drummond, J. D. Bloom, C. Adami, F. H. Arnold. The protein society nineteenth symposium, Boston, MA. July 30–August 3, 2005.
40. Seminar talk. Dept. of Computer Science, Michigan State University, MI. Apr. 25, 2005.
39. Seminar talk. Dept. of Microbiology and Biochemistry, Simon Fraser University, BC, Canada. Mar. 12, 2005.
38. Seminar talk. Dept. of Integrative Biology, University of Texas, Austin. Feb. 23, 2005.
37. Talk. CalPEG 2004, San Diego, California. Dec. 11–12, 2004.
36. Talk. Noble Foundation Workshop on Virus Evolution, Ardmore, Oklahoma. Oct. 21, 2004.
35. Invited talk. Santa Fe Institute Workshop “From Structure to Dynamics in Complex Ecological Networks”, Santa Fe, NM. Feb 19–21, 2004.
34. Seminar talk. Los Alamos National Laboratory, Los Alamos, NM. Jan 20, 2004.
33. Seminar talk. Dept. of Ecology and Evolutionary Biology, Yale, New Haven, CT. Nov. 13, 2003.
32. Seminar talk. Keck Graduate Institute, Claremont, CA. Nov 6, 2003.
31. Seminar talk. Center for Bioinformatics, Indiana University School of Medicine, Indianapolis. Sep 29, 2003.
30. Seminar talk. Dept. of Microbiology and Molecular Genetics, UC Irvine. Sep 23, 2003.
29. Talk. 7th European Conference on Artificial Life, Dortmund, Germany. Sep 14–17, 2003.
28. Seminar talk. Iowa State University. Mar 3, 2003.

27. Seminar talk. Biophysics Seminar, Indiana University. Dec 6, 2002.
26. Seminar talk. Ecology, Behavior and Evolution Seminar, UCSD. Oct 18, 2002.
25. Invited talk. Noble Foundation Workshop on Virus Evolution, Ardmore, Oklahoma. Oct. 5, 2002.
24. Seminar talk. Institute for Neural Computing, Ruhr-Universität Bochum. June 12, 2002.
23. Tutorial. World Congress on Computational Intelligence, Honolulu, Hawaii. May 12-17, 2002.
22. Poster with K. Nanlohy, C. Ofria, R. E. Lenski and C. Adami. Workshop on Integrating Education in BioComplexity Research. Washington, DC. April 2002.
21. Seminar talk. Computational Biology Seminar, University of Southern California. April 11, 2002.
20. Poster with R. E. Lenski and C. Adami. Gordon Conference on Molecular Evolution, Ventura, CA. Jan. 13–18 2002.
19. Poster with J. L. Wang, C. Ofria, R. E. Lenski and C. Adami. Mathematics and Molecular Biology VII. Santa Fe, NM. Jan. 5–10 2002.
18. Seminar talk. Institute of Theoretical Physics, University of Sao Paulo, Sao Carlos, SP, Brazil. October 16, 2001.
17. Poster. Gordon Conference on Microbial Population Biology, Williamstown, MA. July 29–August 3, 2001.
16. Tutorial with Charles Ofria. GECCO2001, San Francisco, CA. July 7–11, 2001.
15. Poster with P. R. A. Campos. XXIV National Meeting on Condensed Matter Physics, Sao Lourenco-MG, Brazil. May 18 2001.
14. Seminar talk. Center of Biological Modeling, Michigan State University, East Lansing, Michigan. Dec. 8 2000.
13. Tutorial. Seventh International Conference on Artificial Life, Portland, Oregon. Aug. 1–6 2000.
12. Talk. Computation and Neural Systems, Caltech, Annual Retreat. Jan. 28–30 2000.
11. Seminar talk. Biomolecular Information Processing group, German National Research Center for Information Technology GMD, Sankt Augustin. Oct. 1 1999.
10. Poster with C. Ronnewinkel and T. Martinetz. 5th European Conference on Artificial Life, Lausanne. Sep. 13–17 1999.
9. Poster with C. Ronnewinkel. Winterschool on Dynamical Diseases, Berlin. Feb. 22–26, 1999.
8. Talk. 3rd German Workshop on Artificial Life, Bochum. Sep. 17–18 1998.
7. Poster with S. Altmeyer and T. Martinetz. 3rd German Workshop on Artificial Life, Bochum. Sep. 17–18 1998.
6. Seminar talk. Nonlinear Dynamics Group, Institute of Physics, University of Potsdam. Sep. 9 1998.

5. Talk. Sixth International Conference on Artificial Life, Los Angeles, CA. June 26–29 1998.
4. Talk. Institute for Neural Computing, Ruhr-Universität Bochum, Annual Retreat. April 21–23 1997.
3. Talk. 2nd German Workshop on Artificial Life, Dortmund. April 17–18 1997.
2. Poster with M. Kachelrieß and G. Wunner. 18th Texas Symposium on Relativistic Astrophysics, Chicago, Illinois. Dec. 15–20, 1996.
1. Poster with G. Wunner. Scientific Fall Meeting of the Astronomische Gesellschaft, Tübingen. Sep. 16–21, 1996.