

CURRICULUM VITAE AND PUBLICATION LIST

SEBASTIAN BONHOEFFER

Personal History

- 65 Born in Tübingen, Germany
- 71-75 Primary school, Tübingen
- 75-84 Secondary school (classics), Uhland-gymnasium, Tübingen
- 83-84 Junior student of Heinrich Schiff at the Musikhochschule (Music Academy), Cologne, Germany
- 84-85 Community service near Tübingen (personal nurse of a handicapped person)
- 84-87 Cello studies with Heinrich Schiff at the Music Academy, Basel, Switzerland. Awarded the Hubert-Bloch Scholarship (85-87). Lehrdiplom in 87.
- 87-89 Physics undergraduate at the Ludwigs-Maximilians Universität, Munich, Germany. Vordiplom in April 89
- 87-88 Masterclass at the Musikakademie, Basel. Konzertdiplom with distinction in June 88.
- 89-92 Second half of physics undergraduate studies at the University of Vienna, Austria. Diploma thesis in Theoretical Chemistry on “Temperature Dependent RNA Folding Landscapes” in the group of Peter Schuster. Diploma examination in April 92. April 92-September 92 Research Assistant in Peter Schuster’s group.
- 92-95 D.phil. thesis entitled “Models of Viral Evolution” at the University of Oxford. Supervisors: Martin Nowak and Robert May. Awarded a Scholarship from the Boehringer Ingelheim Fonds, Stuttgart, Germany and a SERC Research Studentship. Completed in June 95.
- 95-96 Florey Research Fellow at Lady Margaret Hall, Oxford
- 95-98 Wellcome Research Assistant at the Wellcome Centre for the Epidemiology of Infectious Disease, Oxford
- 97-98 Senior Research Fellow, Wolfson College, Oxford
- 97 Visiting Scientist at the Aaron Diamond AIDS Research Center by invitation from David Ho, New York
- 98 Assistant of Prof. P. Schmid-Hempel, ETH Zurich
- 99-01 Junior Group Leader at the Friedrich Miescher Institut, Basel
- 01-05 SNF Research Professor, ETH Zurich
- 05- Full Professor, ETH Zurich

Addresses

work

Institute of Integrative Biology
Group of Theoretical Biology, ETH Zürich CHN
Universitätsstr. 16
CH-8092 Zürich
Switzerland
ph: +41 1 6327106
fax: +41 1 6321271
secr: +41 1 6336033
email: seb@env.ethz.ch

private

Möhrlistr. 82
CH-8008 Zürich
Switzerland

+41 1 4221644

+41 1 4225447

Editorial Board Memberships

- Journal of Theoretical Medicine
- Proceedings of the Royal Society Series B
- PLOS Computational Biology
- Journal of Theoretical Biology

Current research interests in keywords

In broad terms my group is interested in (both experimental and theoretical) microbial population biology and evolution.

- Evolution of drug resistance (HIV, influenza, antibiotics)
- Evolution of recombination in retroviruses
- Evolution of sex (Epistasis based hypothesis, Drift based hypothesis, Red Queen Hypothesis)
- Host-parasite coevolution (Evolution of virulence, Red-Queen Dynamics)
- Viral population dynamics (HIV, SIV, HBV, HCV)
- Experimental evolution (Evolution of metabolism, Trade-offs in microbial growth properties)
- Evolution of biochemical reaction networks (Evolution of signalling networks and metabolic pathways)
- Theoretical immunology (Recognition of self versus non-self, T cell competition)

Teaching

- Population biology (autumn term, together with P. Schmid-Hempel and J. Jokela), ETH Zurich, for Bachelor students of Biology and Masters students of Environmental Science.

- Ecology and Evolution of Infectious Disease; Current Topics (autumn term, together with P. Schmid-Hempel and B. McDonald), ETH Zurich, for Masters students of Biology and Environmental Science.
- Modelling course in population biology (spring term), ETH Zuerich, for Bachelor students of Biology and Masters students of Environmental Science.
- Guarda Workshop on Evolutionary Biology (spring term, together with D. Ebert), for Masters students of Biology and Environmental Science.
- HIV Seminar, University Hospital, University of Zurich, (every term, together with H. Günthard, A. Trkola and A. Oxenius)

Group members and affiliates

Within my group I have two subgroups that are lead by senior scientists (ass. Prof M Ackermann and Dr. R. Regoes). These groups are funded mostly by grants but also receive substantial financial aid from my budget.

Senior scientists:

- Martin Ackermann, SNF Professor (microbial population biology)
- Roland Regoes, Oberassistent (Theoretical immunology and disease dynamics)

Postdocs:

- Jan Engelstädter (genomic conflict)
- Marcel Salathe (Coevolution of viral pathogens and immune response)
- Dusan Misevic (digital evolution)
- David Fouchet (Theoretical Immunology & population genetics, Group Regoes and Bonhoeffer)
- Olin Silander (Evolutionary genetics, Group Ackermann)

PhD students:

- Maja Novak (experimental evolution)
- Trevor Hinkley (systems biology, networks, HIV drug resistance)
- Joao Martins (HIV drug resistance)
- Rafal Mostowy (Host parasite coevolution)
- Roger Kouyos (Theoretical population genetics)
- Pia Schulz zur Wiesch (Antibiotic resistance)
- Nikki Freed (Experimental evolution, Group Ackermann)
- Tobias Bergmiller (Experimental evolution, Group Ackermann)
- Frederik Graw (Theoretical immunology, Group Regoes)
- Carsten Magnus (HIV entry, Group Regoes)

Former group members:

- Georg Funk (now postdoc at the University of Basel)
- Thomas Pfeiffer (now postdoc at Harvard University)
- Christian Althaus (now PhD at Utrecht University)
- Michael Bretscher (now PhD at the Swiss Tropical Institute)
- Viktor Müller (now postdoc at Etvös Lorand University, Budapest)
- Orkun Soyer (now postdoc at Microsoft Research Center for Computational and Systems Biology, Trento, Italy)
- Almut Scherer (now at Bristol Meyer Squibbs)

Publications

Please note, that for reasons of convenience of updating, this publication list is generated automatically from those listed in the ISI database. It therefore does not include the most recent published papers, papers in press or submitted papers, but includes a few short non-refereed publications, such as News and Views, etc. It does not include book chapters.

1. Debarre, F, **Bonhoeffer, S**, Regoes, RR (2007)
The effect of population structure on the emergence of drug resistance during influenza pandemics
JOURNAL OF THE ROYAL SOCIETY INTERFACE 4:893-906
2. Kouyos, RD, Silander, OK, **Bonhoeffer, S** (2007)
Epistasis between deleterious mutations and the evolution of recombination
TRENDS IN ECOLOGY & EVOLUTION 22:308-315
3. Kouyos, RD, Althaus, CL, **Bonhoeffer, S** (2006)
Stochastic or deterministic: what is the effective population size of HIV-1?
TRENDS IN MICROBIOLOGY 14:507-511
4. von Wyl, V, Yerly, S, Boni, J, Schupbach, J, Burgisser, P, Klimkait, T, Rickenbach, M, Perrin, L, **Bonhoeffer, S**, Ledergerber, B, Günthard, H (2006)
Prevalence of HIV-1 drug resistance in Switzerland between 1999 and 2004: no trend for an increase
ANTIVIRAL THERAPY 11:S117-S117
5. Soyer, OS, **Bonhoeffer, S** (2006)
Evolution of complexity in signaling pathways
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 103:16337-16342
6. Brandin, E, Thorstensson, R, **Bonhoeffer, S**, Albert, J (2006)
Rapid viral decay in simian immunodeficiency virus-infected macaques receiving quadruple antiretroviral therapy
JOURNAL OF VIROLOGY 80:9861-9864

7. Scherer, A, Salathé, M, **Bonhoeffer, S** (2006)
High epitope expression levels increase competition between T cells
PLOS COMPUTATIONAL BIOLOGY 2:948-958
8. Novak, M, Pfeiffer, T, Lenski, RE, Sauer, U, **Bonhoeffer, S** (2006)
Experimental tests for an evolutionary trade-off between growth rate and yield in E-coli
AMERICAN NATURALIST 168:242-251
9. Soyer, OS, Pfeiffer, T, **Bonhoeffer, S** (2006)
Simulating the evolution of signal transduction pathways
JOURNAL OF THEORETICAL BIOLOGY 241:223-232
10. Funk, GA, Oxenius, A, Fischer, M, Opravil, M, Joos, B, Flepp, M, Weber, R, Günthard, HF, **Bonhoeffer, S** (2006)
HIV replication elicits little cytopathic effects little cytopathic effects in vivo: Analysis of surrogate markers for virus production, cytotoxic T cell response and infected cell death
JOURNAL OF MEDICAL VIROLOGY 78:1141-1146
11. Salathé, M, Salathé, R, Schmid-Hempel, P, **Bonhoeffer, S** (2006)
Mutation accumulation in space and the maintenance of sexual reproduction
ECOLOGY LETTERS 9:941-946
12. Regoes, RR, Bowen, EF, Cope, AV, Gor, D, Hassan-Walker, AF, Prentice, HG, Johnson, MA, Sweny, P, Burroughs, AK, Griffiths, PD, **Bonhoeffer, S**, Emery, VC (2006)
Modelling cytomegalovirus replication patterns in the human host: factors important for pathogenesis
PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES 273:1961-1967
13. Kouyos, RD, Otto, SP, **Bonhoeffer, S** (2006)
Effect of varying epistasis on the evolution of recombination
GENETICS 173:589-597
14. **Bonhoeffer, S**, Chappey, C, Parkin, NT, Whitcomb, JM, Petropoulos, CJ (2006)
Response to comment on "Evidence for positive epistasis in HIV-1"
SCIENCE 312:-
15. Regoes, RR, **Bonhoeffer, S** (2006)
Emergence of drug-resistant influenza virus: Population dynamical considerations
SCIENCE 312:389-391
16. Müller, V, Ledergerber, B, Perrin, L, Klimkait, T, Furrer, H, Telenti, A, Bernasconi, E, Vernazza, P, Günthard, HF, Günthard, F, **Bonhoeffer, S** (2006)
Stable virulence levels in the HIV epidemic of Switzerland over two decades
AIDS 20:889-894
17. Salathé, M, Ackermann, M, **Bonhoeffer, S** (2006)
The effect of multifunctionality on the rate of evolution in yeast
MOLECULAR BIOLOGY AND EVOLUTION 23:721-722
18. Soyer, OS, Salathé, M, **Bonhoeffer, S** (2006)
Signal transduction networks: Topology, response and biochemical processes
JOURNAL OF THEORETICAL BIOLOGY 238:416-425
19. Salathé, M, May, RM, **Bonhoeffer, S** (2005)
The evolution of network topology by selective removal
JOURNAL OF THE ROYAL SOCIETY INTERFACE 2:533-536

20. Althaus, CL, **Bonhoeffer, S** (2005)
Stochastic interplay between mutation and recombination during the acquisition of drug resistance mutations in human immunodeficiency virus type 1
JOURNAL OF VIROLOGY 79:13572-13578
21. Salathé, M, Scherer, A, **Bonhoeffer, S** (2005)
Neutral drift and polymorphism in gene-for-gene systems
ECOLOGY LETTERS 8:925-932
22. Brandin, E, Brostrom, C, Gille, E, **Bonhoeffer, S**, Albert, J (2005)
HIV type 2 dynamics
AIDS RESEARCH AND HUMAN RETROVIRUSES 21:608-610
23. Pfeiffer, T, Soyer, OS, **Bonhoeffer, S** (2005)
The evolution of connectivity in metabolic networks
PLOS BIOLOGY 3:1269-1275
24. Pfeiffer, T, Rutte, C, Killingback, T, Taborsky, M, **Bonhoeffer, S** (2005)
Evolution of cooperation by generalized reciprocity
PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES 272:1115-1120
25. Regoes, RR, **Bonhoeffer, S** (2005)
The HIV coreceptor switch: a population dynamical perspective
TRENDS IN MICROBIOLOGY 13:269-277
26. Müller, V, **Bonhoeffer, S** (2005)
Guanine-adenine bias: a general property of retroid viruses that is unrelated to host-induced hypermutation
TRENDS IN GENETICS 21:264-268
27. Kreft, JU, **Bonhoeffer, S** (2005)
The evolution of groups of cooperating bacteria and the growth rate versus yield trade-off
MICROBIOLOGY-SGM 151:637-641
28. Scherer, A, **Bonhoeffer, S** (2005)
Epitope down-modulation as a mechanism for the coexistence of competing T-cells
JOURNAL OF THEORETICAL BIOLOGY 233:379-390
29. Funk, GA, Jansen, VAA, **Bonhoeffer, S**, Killingback, T (2005)
Spatial models of virus-immune dynamics
JOURNAL OF THEORETICAL BIOLOGY 233:221-236
30. Petropoulos, CJ, Huang, W, Toma, J, Fransen, S, **Bonhoeffer, S**, Whitcomb, JM (2004)
Resistance to HIV-1 entry inhibitors may occur by multiple molecular mechanisms
ANTIVIRAL THERAPY 9:U35-U35
31. **Bonhoeffer, S**, Chappey, C, Parkin, NT, Whitcomb, JM, Petropoulos, CJ (2004)
Evidence for positive epistasis in HIV-1
SCIENCE 306:1547-1550
32. Ciuffi, A, Bleiber, G, Munoz, M, Martinez, R, Loeuillet, C, Rehr, M, Fischer, M, Günthard, HF, Oxenius, A, Meylan, P, **Bonhoeffer, S**, Trono, D, Telenti, A (2004)
Entry and transcription as key determinants of differences in CD4 T-cell permissiveness to human immunodeficiency virus type 1 infection
JOURNAL OF VIROLOGY 78:10747-10754

33. Trkola, A, Kuster, H, Leemann, C, Oxenius, A, Fagard, C, Furrer, H, Battegay, M, Vernazza, P, Bernasconi, E, Weber, R, Hirschel, B, **Bonhoeffer, S**, Günthard, HF (2004)
Humoral immunity to HIV-1: kinetics of antibody responses in chronic infection reflects capacity of immune system to improve viral set point
BLOOD 104:1784-1792
34. Hersberger, M, **Bonhoeffer, S**, Rampini, SK, Opravil, M, Marti-Jaun, J, Telenti, A, Hanseler, E, Ledergerber, B, Speck, RF (2004)
CCTTT-repeat polymorphism of the inducible nitric oxide synthase is not associated with HIV pathogenesis
CLINICAL AND EXPERIMENTAL IMMUNOLOGY 137:566-569
35. Rusert, P, Fischer, M, Joos, B, Leemann, C, Kuster, H, Flepp, M, **Bonhoeffer, S**, Günthard, HF, Trkola, A (2004)
Quantification of infectious HIV-1 plasma viral load using a boosted in vitro infection protocol
VIROLOGY 326:113-129
36. Pfeiffer, T, **Bonhoeffer, S** (2004)
Evolution of cross-feeding in microbial populations
AMERICAN NATURALIST 163:E126-E135
37. Molinier, J, Ries, G, **Bonhoeffer, S**, Hohn, B (2004)
Interchromatid and interhomolog recombination in Arabidopsis thaliana
PLANT CELL 16:342-352
38. Bretscher, MT, Althaus, CL, Müller, V, **Bonhoeffer, S** (2004)
Recombination in HIV and the evolution of drug resistance: for better or for worse?
BIOESSAYS 26:180-188
39. Günthard, H, Joos, B, Kuster, H, Fischer, M, Leemann, C, Boni, J, Oxenius, A, Fagard, C, Hirschel, B, Wong, J, Phillips, R, **Bonhoeffer, S**, Weber, R, Trkola, A (2003)
Virus characteristics predict viraemia control after cessation of antiretroviral therapy
ANTIVIRAL THERAPY 8:U63-U63
40. Trkola, A, Kuster, H, Leemann, C, Ruprecht, C, Joos, B, Telenti, A, Hirschel, B, Weber, R, **Bonhoeffer, S**, Günthard, HF (2003)
Human immunodeficiency virus type 1 fitness is a determining factor in viral rebound and set point in chronic infection
JOURNAL OF VIROLOGY 77:13146-13155
41. **Bonhoeffer, S**, Funk, GA, Günthard, HF, Fischer, M, Müller, V (2003)
Glancing behind virus load variation in HIV-1 infection
TRENDS IN MICROBIOLOGY 11:499-504
42. Metzner, KJ, **Bonhoeffer, S**, Fischer, M, Karanickolas, R, Allers, K, Joos, B, Weber, R, Hirschel, B, Kostrikis, LG, Günthard, HF (2003)
Emergence of minor populations of human immunodeficiency virus type 1 carrying the M184V and L90M mutations in subjects undergoing structured treatment interruptions
JOURNAL OF INFECTIOUS DISEASES 188:1433-1443
43. Müller, V, **Bonhoeffer, S** (2003)
Response to Bandeira and Faro: Closing the circle of constraints
TRENDS IN IMMUNOLOGY 24:173-175

44. Müller, V, **Bonhoeffer, S** (2003)
Quantitative constraints on the scope of negative selection.
TRENDS IN IMMUNOLOGY 24:132-135
45. Pfeiffer, T, **Bonhoeffer, S** (2003)
An evolutionary scenario for the transition to undifferentiated multicellularity
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 100:1095-1098
46. Brown, MJF, **Bonhoeffer, S** (2003)
On the evolution of claustral colony founding in ants
EVOLUTIONARY ECOLOGY RESEARCH 5:305-313
47. **Bonhoeffer, S**, Sniegowski, P (2002)
Virus evolution - The importance of being erroneous
NATURE 420:367-+
48. Regoes, RR, **Bonhoeffer, S** (2002)
HIV coreceptor usage and drug treatment
JOURNAL OF THEORETICAL BIOLOGY 217:443-457
49. **Bonhoeffer, S**, Barbour, AD, De Boer, RJ (2002)
Procedures for reliable estimation of viral fitness from time-series data
PROCEEDINGS OF THE ROYAL SOCIETY OF LONDON SERIES B-BIOLOGICAL SCIENCES 269:1887-1893
50. Müller, V, Viguera-Gomez, JF, **Bonhoeffer, S** (2002)
Decelerating decay of latently infected cells during prolonged therapy for human immunodeficiency virus type 1 infection
JOURNAL OF VIROLOGY 76:8963-8965
51. Metzner, KJ, **Bonhoeffer, S**, Fischer, M, Karanicolas, R, Weber, R, Hirschel, B, Kostrikis, LG, Günthard, HF (2002)
Detection of minor populations of drug-resistant viruses in patients undergoing structured treatment interruptions
ANTIVIRAL THERAPY 7:S96-S96
52. Regoes, RR, Ebert, D, **Bonhoeffer, S** (2002)
Dose-dependent infection rates of parasites produce the Allee effect in epidemiology
PROCEEDINGS OF THE ROYAL SOCIETY OF LONDON SERIES B-BIOLOGICAL SCIENCES 269:271-279
53. Regoes, RR, Staprans, SI, Feinberg, MB, **Bonhoeffer, S** (2002)
Contribution of peaks of virus load to simian immunodeficiency virus pathogenesis
JOURNAL OF VIROLOGY 76:2573-2578
54. Pfeiffer, T, **Bonhoeffer, S** (2002)
Evolutionary consequences of tradeoffs between yield and rate of ATP production
ZEITSCHRIFT FÜR PHYSIKALISCHE CHEMIE-INTERNATIONAL JOURNAL OF RESEARCH IN PHYSICAL CHEMISTRY & CHEMICAL PHYSICS 216:51-63
55. Ortiz, GM, Hu, J, Goldwitz, JA, Chandwani, R, Larsson, M, Bhardwaj, N, **Bonhoeffer, S**, Ramratnam, B, Zhang, LQ, Markowitz, MM, Nixon, DF (2002)
Residual viral replication during antiretroviral therapy boosts human immunodeficiency virus type 1-specific CD8(+) T-cell responses in subjects treated early after infection
JOURNAL OF VIROLOGY 76:411-415

56. Betts, MR, Ambrozak, DR, Douek, DC, **Bonhoeffer, S**, Brenchley, JM, Casazza, JP, Koup, RA, Picker, LJ (2001)
Analysis of total human immunodeficiency virus (HIV)-specific CD4(+) and CD8(+) T-cell responses: Relationship to viral load in untreated HIV infection
JOURNAL OF VIROLOGY 75:11983-11991
57. Ortiz, GM, Wellons, M, Brancato, J, Vo, HTT, Zinn, RL, Clarkson, DE, Van Loon, K, **Bonhoeffer, S**, Miralles, GD, Montefiori, D, Bartlett, JA, Nixon, DF (2001)
Structured antiretroviral treatment interruptions in chronically HIV-1-infected subjects
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 98:13288-13293
58. Pfeiffer, T, Schuster, S, **Bonhoeffer, S** (2001)
Cooperation and competition in the evolution of ATP-producing pathways (vol 292, pg 504, 2001)
SCIENCE 293:1436-1436
59. Garcia, F, Plana, M, Ortiz, GM, **Bonhoeffer, S**, Soriano, A, Vidal, C, Cruceta, A, Arnedo, M, Gil, C, Pantaleo, G, Pumarola, T, Gallart, T, Nixon, DF, Miro, JM, Gatell, JM (2001)
The virological and immunological consequences of structured treatment interruptions in chronic HIV-1 infection
AIDS 15:F29-F40
60. Funk, GA, Fischer, M, Joos, B, Opravil, M, Günthard, HF, Ledergerber, B, **Bonhoeffer, S** (2001)
Quantification of in vivo replicative capacity of HIV-1 in different compartments of infected cells
JOURNAL OF ACQUIRED IMMUNE DEFICIENCY SYNDROMES 26:397-404
61. Pfeiffer, T, Schuster, S, **Bonhoeffer, S** (2001)
Cooperation and competition in the evolution of ATP-producing pathways
SCIENCE 292:504-507
62. **Bonhoeffer, S**, Rembiszewski, M, Ortiz, GM, Nixon, DF (2000)
Risks and benefits of structured antiretroviral drug therapy interruptions in HIV-1 infection
AIDS 14:2313-2322
63. Jin, X, Ogg, G, **Bonhoeffer, S**, Safrit, J, Vesanen, M, Bauer, D, Chen, D, Cao, YZ, Demoitie, MA, Zhang, LQ, Markowitz, M, Nixon, D, McMichael, A, Ho, DD (2000)
An antigenic threshold for maintaining human immunodeficiency virus type 1-specific cytotoxic T lymphocytes
MOLECULAR MEDICINE 6:803-809
64. Ribeiro, RM, **Bonhoeffer, S** (2000)
Production of resistant HIV mutants during antiretroviral therapy
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 97:7681-7686
65. Binley, JM, Clas, B, Gettie, A, Vesanen, M, Montefiori, DC, Sawyer, L, Booth, J, Lewis, M, Marx, PA, **Bonhoeffer, S**, Moore, JP (2000)
Passive infusion of immune serum into simian immunodeficiency virus-infected rhesus macaques undergoing a rapid disease course has minimal effect on plasma viremia
VIROLOGY 270:237-249

66. **Bonhoeffer, S**, Mohri, H, Ho, D, Perelson, AS (2000)
Quantification of cell turnover kinetics using 5-bromo-2'-deoxyuridine
JOURNAL OF IMMUNOLOGY 164:5049-5054
67. Regoes, RR, Nowak, MA, **Bonhoeffer, S** (2000)
Evolution of virulence in a heterogeneous host population
EVOLUTION 54:64-71
68. Jin, X, Demoitie, MA, Donahoe, SM, Ogg, GS, **Bonhoeffer, S**, Kakimoto, WM, Gillespie, G, Moss, PA, Dyer, W, Kurilla, MG, Riddell, SR, Downie, J, Sullivan, JS, McMichael, AJ, Workman, C, Nixon, DF (2000)
*High frequency of cytomegalovirus-specific cytotoxic T-effector cells in HLA-A*0201-positive subjects during multiple viral coinfections*
JOURNAL OF INFECTIOUS DISEASES 181:165-175
69. Ramratnam, B, **Bonhoeffer, S**, Binley, J, Hurley, A, Zhang, LQ, Mittler, JE, Markowitz, M, Moore, JP, Perelson, AS, Ho, DD (1999)
Rapid production and clearance of HIV-1 and hepatitis C virus assessed by large volume plasma apheresis
LANCET 354:1782-1785
70. Ortiz, GM, Nixon, DF, Trkola, A, Binley, J, Jin, X, **Bonhoeffer, S**, Kuebler, PJ, Donahoe, SM, Demoitie, MA, Kakimoto, WM, Ketas, T, Clas, B, Heymann, JJ, Zhang, LQ, Cao, YZ, Hurley, A, Moore, JP, Ho, DD, Markowitz, M (1999)
HIV-1-specific immune responses in subjects who temporarily contain virus replication after discontinuation of highly active antiretroviral therapy
JOURNAL OF CLINICAL INVESTIGATION 104:R13-R18
71. Parkin, NT, Lie, YS, Hellmann, N, Markowitz, M, **Bonhoeffer, S**, Ho, DD, Petropoulos, CJ (1999)
Phenotypic changes in drug susceptibility associated with failure of human immunodeficiency virus type 1 (HIV-1) triple combination therapy
JOURNAL OF INFECTIOUS DISEASES 180:865-870
72. Nixon, DF, Douek, D, Kuebler, PJ, Jin, X, Vesanen, M, **Bonhoeffer, S**, Cao, YZ, Koup, RA, Ho, DD, Markowitz, M (1999)
Molecular tracking of an Human Immunodeficiency Virus nef specific cytotoxic T-cell clone shows persistence of clone-specific T-cell receptor DNA but not mRNA following early combination antiretroviral therapy
IMMUNOLOGY LETTERS 66:219-228
73. Ribeiro, RM, **Bonhoeffer, S** (1999)
A stochastic model for primary HIV infection: optimal timing of therapy
AIDS 13:351-357
74. Levin, BR, Lipsitch, M, **Bonhoeffer, S** (1999)
Evolution and disease - Population biology, evolution, and infectious disease: Convergence and synthesis
SCIENCE 283:806-809
75. **Bonhoeffer, S** (1999)
Turning points - A random walk from the cello to the lab
CURRENT BIOLOGY 9:R5-R5
76. Ogg, GS, Jin, X, **Bonhoeffer, S**, Moss, P, Nowak, MA, Monard, S, Segal, JP, Cao, Y, Rowland-Jones, SL, Hurley, A, Markowitz, M, Ho, DD, McMichael, AJ, Nixon, DF (1999)

Decay kinetics of human immunodeficiency virus-specific effector cytotoxic T lymphocytes after combination antiretroviral therapy
JOURNAL OF VIROLOGY 73:797-800

77. Zhang, LQ, Dailey, PJ, He, T, Gettie, A, **Bonhoeffer, S**, Perelson, AS, Ho, DD (1999)
Rapid clearance of simian immunodeficiency virus particles from plasma of rhesus macaques
JOURNAL OF VIROLOGY 73:855-860
78. **Bonhoeffer, S** (1998)
Models of viral kinetics and drug resistance in HIV-1 infection
AIDS PATIENT CARE AND STDS 12:769-774
79. Connor, RI, Montefiori, DC, Binley, JM, Moore, JP, **Bonhoeffer, S**, Gettie, A, Fenamore, EA, Sheridan, KE, Ho, DD, Dailey, PJ, Marx, PA (1998)
Temporal analyses of virus replication, immune responses, and efficacy in rhesus macaques immunized with a live, attenuated simian immunodeficiency virus vaccine
JOURNAL OF VIROLOGY 72:7501-7509
80. Morris, L, Binley, JM, Clas, BA, **Bonhoeffer, S**, Astill, TP, Kost, R, Hurley, A, Cao, YZ, Markowitz, M, Ho, DD, Moore, JP (1998)
HIV-1 antigen-specific and -nonspecific B cell responses are sensitive to combination antiretroviral therapy
JOURNAL OF EXPERIMENTAL MEDICINE 188:233-245
81. Ogg, GS, Jin, X, **Bonhoeffer, S**, Dunbar, PR, Nowak, MA, Monard, S, Segal, JP, Cao, YZ, Rowland-Jones, SL, Cerundolo, V, Hurley, A, Markowitz, M, Ho, DD, Nixon, DF, McMichael, AJ (1998)
Quantitation of HIV-1-specific cytotoxic T lymphocytes and plasma load of viral RNA
SCIENCE 279:2103-2106
82. Ribeiro, RM, **Bonhoeffer, S**, Nowak, MA (1998)
The frequency of resistant mutant virus before antiviral therapy
AIDS 12:461-465
83. Mohri, H, **Bonhoeffer, S**, Monard, S, Perelson, AS, Ho, DD (1998)
Rapid turnover of T lymphocytes in SIV-infected rhesus macaques
SCIENCE 279:1223-1227
84. Levin, BR, Antia, R, Berliner, E, Bloland, P, **Bonhoeffer, S**, Cohen, M, DeRouin, T, Fields, PI, Jafari, H, Jernigan, D, Lipsitch, M, McGowan, JE, Mead, P, Nowak, M, Porco, T, Sykora, P, Simonsen, L, Spitznagel, J, Tauxe, R, Tenover, F (1998)
Resistance to antimicrobial chemotherapy: A prescription for research and action
AMERICAN JOURNAL OF THE MEDICAL SCIENCES 315:87-94
85. **Bonhoeffer, S**, Lipsitch, M, Levin, BR (1997)
Evaluating treatment protocols to prevent antibiotic resistance
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 94:12106-12111
86. Bittner, B, **Bonhoeffer, S**, Nowak, MA (1997)
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