Alison F. Feder

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Education

2013-2018 PhD, Biology, Stanford University, Stanford, CA
2012-2013 MSc (by Research), Statistics, University of Oxford, Oxford, UK
2008-2012 BA, Mathematics, *summa cum laude*, University of Pennsylvania, Philadelphia, PA

Research Experience

2018-2021 Miller Fellow, Department of Integrative Biology, *University of California, Berkeley*
(advisors: Oskar Hallatschek & Montgomery Slatkin)
2013-2018 PhD Student, Department of Biology, *Stanford University*
(advisor: Dmitri Petrov)
2012-2013 MSc Student, Department of Statistics, *University of Oxford*
(advisor: Gilean McVean)
2009-2012 Undergraduate researcher, Department of Biology, *University of Pennsylvania*
(advisor: Joshua Plotkin)
Sum. 2011 Undergraduate researcher, Department of Biology, *Stanford University*
(advisor: Dmitri Petrov)
Sum. 2010 Amgen Scholar, Dept. of Integrative Biology, *Univeristy of California, Berkeley*
(advisors: Rasmus Nielsen & Montgomery Slatkin)
Sum. 2009 Undergraduate researcher, Penn Genome Frontiers Institute, *U. Pennsylvania*
Spring 2009 Undergraduate researcher, Department of Biology, *University of Pennsylvania*
(advisor: Warren Ewens)

Fellowships

2018-2021 Miller Fellowship [Website]
2017-2018 Stanford Center for Computational, Evolutionary & Human Genomics Fellowship [Website]
2016-2017 Gerald J. Lieberman Fellowship [Website]
Awarded yearly to 12 graduate students across Stanford whose research, teaching, and service to the university have demonstrated their potential for becoming academic leaders.
2012-2017 National Science Foundation Graduate Research Fellowship [Website]
2012-2013 Thouron Award [Website]
Thouron Fellowships fully support graduate study in the UK and are awarded yearly to four to six University of Pennsylvania seniors or alumni to promote intellectual exchange between the USA and the UK.

Awards and Grants

2018	Milner Prize in Evolutionary Biology
2018	Samuel Karlin Prize in Mathematical Biology *Awarded to one graduate student in the Stanford Department of Biology per year whose dissertation reaches the highest standard of mathematical biology*
2018	James F. Crow Early Career Researcher Finalist (Genetics Society of America)
2017	Gil Omenn Prize for the best article in evolutionary medicine published in the previous year *Awarded for 'More effective drugs lead to harder selective sweeps in the evolution of drug resistance in HIV-1'*
2015	Excellence in Teaching Award (Department of Biology, Stanford)
2014	Center for Computational, Evolutionary and Human Genomics Trainee Grant
2012	Penn Genome Frontiers Institute Excellence in Genomics Undergraduate Award
2012	Phi Beta Kappa (University of Pennsylvania)
2011	College House Deans' Integrated Knowledge Award (University of Pennsylvania)
2011	University Scholars Summer Research Grant (University of Pennsylvania)
2010	University of California Berkeley Amgen Scholar

Peer-Reviewed Publications (* denotes equal contributions)

9. **A. F. Feder**, P. S. Pennings, J. Hermisson*, D. A. Petrov* (2019). Evolutionary dynamics in structured populations under strong population genetic forces. *(G3: GENES, GENOMES, GENETICS)* 9(10):3395-3407. [Link]

8. R. S. Mehta, **A. F. Feder**, S. M. Boca, N. A. Rosenberg (2019). The relationship between haplotype-based F_{ST} and haplotype length. *Genetics* 213(1):281-295. [Link]

7. K. Theys*, **A. F. Feder***, M. Gelbart*, M. Hartl, A. Stern, and P. S. Pennings (2018). Within-patient HIV mutation frequencies reveal fitness costs of CpG dinucleotides, drastic amino acid changes and G $\rightarrow$ A mutations. *PLoS Genetics* 14(6): e1007420. [Link]

6. **A. F. Feder**, C. Kline, P. Polacino, M. Cottrell, A. D. Kashuba, B. F. Keele, S.-L. Hu, D. A. Petrov, P. S. Pennings*, and Z. Ambrose* (2017). A spatio-temporal assessment of simian/human immunodeficiency virus (SHIV) evolution reveals a highly dynamic process within the host. *PLoS Pathogens*, 13(5): e1006358. [Link]

5. B. A. Wilson*, N. R. Garud*, **A. F. Feder***, Z. J. Assaf*, and P. S. Pennings (2016). The population genetics of drug resistance evolution in natural populations of viral, bacterial and eukaryotic pathogens. *Molecular Ecology*, 25(1):4266. [Link]

4. **A. F. Feder**, S.-Y. Rhee, S. P. Holmes, R. W. Shafer, D. A. Petrov*, and P. S. Pennings* (2016). More effective drugs lead to harder selective sweeps in the evolution of drug resistance in HIV-1. *eLife*, 5:e10670. [Link]

3. **A. F. Feder***, S. Kryazhimskiy*, and J. B. Plotkin (2014). Identifying signatures of selection in genetic time series. *Genetics*, 196(2):509522. [Link]

2. **A. F. Feder**, D. A. Petrov, and A. O. Bergland (2012). LDx: estimation of linkage disequilibrium from high-throughput pooled resequencing data. *PLoS One*, 7(11):e48588. [Link]

Peer-Reviewed Publications (continued)

1. K. E. Lohmueller, A. Albrechtsen, Y. Li, S. Y. Kim, T. Korneliussen, N. Vinckenbosch, G. Tian, E. Huerta-Sanchez, **A. F. Feder**, N. Grarup, T. Jørgensen, T. Jiang, D. R. Witte, A. Sandbæk, I. Hellmann, T. Lauritzen, T. Hansen, O. Pedersen, J. Wang, R. Nielsen (2011). Natural selection affects multiple aspects of genetic variation at putatively neutral sites across the human genome. *PLoS Genetics*, 7(10):e1002326. [Link]

Pre-prints (* denotes equal contributions)

A. F. Feder, P. S. Pennings, D. A. Petrov (2018). The clarifying role of time series data in the population genetics of HIV. bioRxiv, 495275 [Link].

Manuscripts in preparation (available on request)

A. F. Feder, K. Harper, P. S. Pennings, Challenging conventional wisdom on the evolution of resistance to multi-drug HIV treatment: Lessons from modeling that can be applied to other diseases.

Invited Presentations

2019	Science & Mathematics Seminar, University of Puget Sound, Tacoma, USA
2019	European Society of Evolutionary Biology, Turku, Finland
2019	Society of Molecular Biology & Evolution, Manchester, UK
2019	Trainee Invited Speaker Series, Arjun Raj Lab at Penn, Philadelphia, USA
2019	Science & Technology Seminar, Joint Genome Institute, Walnut Creek, USA
2019	Departmental seminar, University of San Francisco, San Francisco, USA
2018	Palo Alto Research Center, Palo Alto, USA
2018	Milner Prize Lecture, University of Bath, Bath, UK
2018	Systems Biology Seminar, Cancer Research UK Cambridge Institute, UK
2018	Ad hoc seminar, University of California, Davis, USA
2018	Institute for Disease Modeling Annual Symposium, Seattle, USA
2017	Center for Theoretical Evolutionary Genomics, University of California, Berkeley, USA
2017	Institute for Disease Modeling, Bellevue, USA
2017	Center for Inference and Dynamics of Infectious Disease, Fred Hutchinson Cancer Research Institute, Seattle, USA
2017	Omenn Prize talk at the International Society of Evolution, Medicine and Public Health, Groningen, Netherlands
2017	Program for Evolutionary Dynamics, Harvard University, Cambridge, USA
2016	"Darwin's Weekly" Seminar, University of Chicago, Chicago, USA

Contributed/selected presentations ** talk* *† poster*

2018	[*] Society for Molecular Biology & Evolution, Yokohama, Japan
2018	[*] James F. Crow Award finalist session at PEQG, Madison, USA
2018	[*] HIV Dynamics & Evolution, Leavenworth, USA
2018	[†] CEHG Symposium, Stanford, USA
2018	[†] Bio-X Interdisciplinary Initiatives Symposium, Stanford, USA

Contributed/Selected Presentations (continued) ** talk* † *poster*

2017 [*] Stanford Surf 'n' Turf Biology Graduate Student Symposium, Monterey, USA
2017 [†] Gordon Research Conference: Microbial Population Biology, Andover, USA
2017 [*] Gordon Research Seminar: Microbial Population Biology, Andover, USA
2017 [*] Society for Molecular Biology & Evolution Annual Meeting, Austin, USA
2016 [*] International Society of Evolution, Medicine and Public Health, Raleigh, USA
2016 [*] International HIV Drug Resistance Workshop, Boston, USA
2016 [††] Conference on Retroviruses and Opportunistic Infections (CROI), Boston, USA
2015 [†] Bio-X Interdisciplinary Initiatives Symposium, Stanford, USA
2015 [*] Society for Molecular Biology & Evolution Annual Meeting, Vienna, Austria
2015 [†] "Forecasting Evolution?" SFB 680 Conference, Lisbon, Portugul
2015 [*] Biomedical Computation at Stanford (BCATS), Stanford, USA
2014 [†] University of Oxford, Department of Statistics First Year Poster Session, Oxford, UK
2011 [*] NIMBioS Undergraduate Research Conference at the Interface of Biology and Mathematics, Knoxville, USA
2011 [††] Society for Molecular Biology & Evolution Annual Meeting, Kyoto, Japan

Competitive travel support

2018 Young Investigator Travel Award from SMBE (Yokohama, Japan)
2016 International Society for Evolutionary Medicine and Public Health Travel Award (Durham, USA)
2016 CROI Young Investigator Scholarship (Boston, USA)
2015 Wellcome Trust Travel Award (for "Forecasting Evolution?" meeting, Lisbon, Portugal)
2013 Cargese Summer School in Quantitative Genetics Grant (Cargese, France)
2011 NiMBioS Undergraduate Conference Grant (Knoxville, USA)

Teaching

University:

Fall 2015 Co-teacher for BioCore Exploration (3 hour course), 'Are we still evolving?' with L. Uricchio
Spring 2015 TA for Bio 143, *Evolution*
Spring 2014 TA for Bio 43, *Evolution, Ecology & Plant Biology*

High School:

2016 Guest lecturer, *Evolutionary genomics theory, application and you!*
Stanford Pre-Collegiate Institute
2014-2016 Stanford Splash! Teacher
Taught 6 one-session mini-courses to high school students (two each on mathematical/logical thinking, population genetics and statistics/probability).

Research Supervision

2016 Michael Herschl, undergraduate, *Stanford University*

Public Outreach

2019	Invited speaker at Nerd Nite East Bay, a general audience seminar series
2017	Finalist in Evolution Film Festival for "Intra-patient Simian-HIV drug resistance evolution: does blood tell the whole story?"
2016	Finalist in Evolution Film Festival for "Better drugs lead to harder sweeps in HIV-1"

Academic, Community & University Service

2019-2020	Miller Symposium Planning Committee
2018	Co-organizer of SMBE 2018 symposium on 'Intra-host evolutionary dynamics' with K. Xue
2017	Co-organizer of 'Petrino' joint lab retreat between D. Petrov and R. Andino (UCSF) labs
2016-2017	Department of Biology TA Mentorship Program mentor and program organizer
2014-2017	Stanford Bioscience Students Association new student Mentor
2014-2015	Mentored student writing NSF Graduate Research Fellowship application

Referee for Evolution, Journal of Theoretical Biology, Molecular Biology and Evolution, PCI Evolutionary Biology, PLOS Computational Biology (with mentor), PLOS Genetics, PNAS