

Graham Coop

Date of Birth: 23/5/1979

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Department of Evolution and Ecology and Center for Population Biology,
UC Davis

Employment

- 2004-2008 Postdoctoral Fellow, Department of Human Genetics, University of Chicago
- 2008-2012 Assistant Professor, Department of Evolution and Ecology, University of California Davis.
- 2012- Associate Professor, Department of Evolution and Ecology, University of California Davis.

Education

- 1997–2001 University of Reading, M.Phys. Physics, 1st Class degree
- 2001–2004 Statistics Department, Oxford University, D.Phil. student.
'Computationally Intensive Methods for Detecting Selection under the Coalescent' supervised by Professor R.C. Griffiths

Awards and Activities

- 2006 ASHG Postdoctoral Presentation Award Finalist. New Orleans.
- 2006 Our work with the Rubin group on Neanderthal genomic DNA along with a paper by the Paabo group was chosen by Science to be one of the breakthroughs of the year.
- 2007 Winner of ASHG Award for Postdoctoral Basic Research. San Diego.
- 2009-2010 Member of Faculty of 1000
- 2009-2013 Sloan Foundation Research Fellowship
- 2013- Associate Editor for PLOS Genetics
- 2014 UC Davis College of Biology Research Prize.
- 2015-2019 UC Davis Chancellor's fellow.

Grant Support for work in Coop lab.

- Sloan Foundation Research Fellowship 2009-2013
- NIH RO1 Recombination Rate Variation and Evolution in Primates (co-Investigator, Przeworski PI)
- NSF Collaborative Research: ABI Innovation: Visualization and Statistics for Spatial Population Genomic Analysis (Ralph and Coop)
- NIH GMS Genome-wide approaches to polygenic adaptation.
- NSF Collaborative Research: The ecological genomic basis of parallel serpentine adaptation in *Mimulus* (Willis, Salt, and Coop)

NSF Postdoctoral fellowship to Yaniv Brandvain (2010), Nancy Chen (2015), Emily Josephs (2015), NRSA Postdoctoral fellowship to Peter Ralph (postdoc).
NSF graduate fellowships to Vince Buffalo, Alisa Sedgihfar, Jeremy Berg, and Kristin Lee.

Papers (* - denotes equal contribution.)

2004

Ancestral inference on gene trees under selection. Coop G. , Griffiths R. C., Theor Popul Biol, 2004; 66; 219-32.

SelSim: a program to simulate population genetic data with natural selection and recombination. Spencer C.C.A., Coop G. Bioinformatics. 2004, 20: 3673-5.

Darwinian Selection on a Selfing Locus. Shimizu KK, Cork JM, Caicedo AL, Mays CA, Moore RC, Olsen KM, Ruzsa S, Coop G, Bustamante CD, Awadalla P, Purugganan MD. Science. 2004, 306, 2081-4. (Later retracted by senior author due to experimental errors).

2005

The rise and fall of the chemoattractant receptor GPR33. Rompler H, Schulz A, Pitra C, Coop G, Przeworski M, Paabo S, Schoneberg T. J Biol Chem. 2005, 284: 31068-75

The signature of positive selection on standing genetic variation. Przeworski M, Coop G, Wall JD. Evolution 2005, 59: 2312-23.

Can a genome change its (hot)spots. Coop G. Trends in Ecology and Evolution. Dec 2005; 20, 643-645

Screening for recently selected alleles by analysis of human haplotype similarity. Hanchard NA, Rockett KA, Spencer C, Coop G, Pinder M, Jallow M, Kimber M, McVean G, Mott R, Kwiatkowski DP. American Journal of Human Genetics, 2005, 78:153-9

2006

Spread of an Inactive Form of Caspase-12 in Humans Is Due to Recent Positive Selection Xue Y, Daly A, Yngvadottir B, Liu M, Coop G, Kim Y, Sabeti P, Chen Y, Stalker J, Huckle E, Burton J, Leonard S, Rogers J, Tyler-Smith C. American Journal of Human Genetics, 2006, 78:659-70

How reliable are empirical genomic scans for selective sweeps? Teshima KM, Coop G, Przeworski M. Genome Res. 2006 Jun;16(6):702-12

A worldwide survey of haplotype variation and linkage disequilibrium in the human genome Conrad DF*, Jakobsson M*, Coop G*, Wen X, Wall JD, Rosenberg NA, Pritchard JK., Nat Gen 2006. 38(11):1251-60

Combining sperm typing and LD analyses reveals differences in selective pressures or recombination rates across human populations. Clark V, Ptak SE, Tiemann-Boege I, Qian Y, Coop G, Stone AC, Przeworski M, Arnheim N, Di Rienzo A. *Genetics*. 2006

Sequencing and analysis of Neanderthal genomic DNA. Noonan JP, Coop G, Kudaravalli S, Smith D, Krause J, Alessi J, Chen F, Platt D, Paabo S, Pritchard JK, Rubin EM. *Science*. 2006, 314:1113-1118.

2007

An evolutionary view of human recombination. Coop G, Przeworski M. *Nat Rev Gen*, 2007. 8:23-34

Live hot, die young. Transmission distortion in recombination hotspots. Coop G*, Myers S.R.*. *PLoS genetics*. 2007

Adaptive drool in the gene pool Novembre J*, Pritchard JK, Coop G*, *Nature Genetics*, 2007

2008

No effect of recombination on the efficacy of natural selection in primates. Bullaughey K, Przeworski M*, Coop G* *Genome Research*. 2008

Adaptations to climate in candidate genes for common metabolic disorders. Hancock AM, Witonsky DB, Gordon AS, Eshel G, Pritchard JK, Coop G, Di Rienzo A. 2008. *PLoS Genetics*.

The timing of selection at the human FOXP2 gene. Coop G, Bullaughey K, Luca F, Przeworski M. *Molecular Biology and Evolution* 2008.

High-resolution mapping of crossovers reveals extensive variation in fine-scale recombination patterns among humans. Coop G, Wen X, Ober C, Pritchard JK, Przeworski M *Science*. 2008

2009

An approximate likelihood for genetic data under a model with recombination and population splitting. Davison D, Pritchard JK, Coop G. *Theor. Pop. Bio.* 2009

Signals of recent positive selection in a worldwide sample of human populations. Pickrell JK, Coop G, Novembre J, Kudaravalli S, Li J, Absher D, Srinivasan B, Barsh GS, Myers RM, Feldman MW, Pritchard JK. (2009) *Genome Research*

The roles of geography in human adaptation. Coop G*, Pickrell JP*, Kudaravalli S, Novembre J, Myers RM, Cavalli-Sforza LL, Feldman MW, Pritchard JK. *PLoS Genetics* 2009

Expression quantitative trait loci detected in cell-lines are often present in primary tissues. Bullaughey K, Chavarría CI, Coop G*, Gilad Y*. *Human Molecular Genetics* 2009

Broad-scale recombination patterns underlying proper disjunction in humans. Fledel-Alon A, Wilson DJ, Broman K, Wen W, Ober C, Coop G*, Przeworski M.* *PLoS Genetics*. 2009

2010

PRDM9 is a Major Determinant of Meiotic Recombination Hotspots in Humans and Mice. Baudat F, Buard J, Grey C, Fledel-Alon A, Ober C, Przeworski M, Coop G, de Massy B. *Science* 2010

The genetics of human adaptation: hard sweeps, soft sweeps, and polygenic adaptation. Prichard JK, Pickrell JK, Coop G. *Current Biology*. 2010

Adaptations to diet, subsistence and ecoregion in the human genome. Hancock, A.M. and Witonsky D.B. and Ehler, E. and Alkorta-Aranburu, G. and Beall, C. and Gebremedhin, A. and Sukernik, R. Utermann, G. and Pritchard, J.K. and Coop, G. and Di Rienzo, A *PNAS* 2010

Using environmental correlations to identify loci underlying local adaptation. Coop G, Witonsky D.B. , Di Rienzo, A , Pritchard JK *Genetics* 2010.

Parallel adaptation: One or many waves of advance of an advantageous allele? Ralph P.L., Coop G. *Genetics* 2010.

Back to nature: ecological genomics of loblolly pine (*Pinus taeda*, Pinaceae). Eckert AJ, Bower AD, González-Martínez SC, Wegrzyn JL, Coop G, Neale DB. *Molecular Ecology*, 2010

2011

Adaptations to climate-mediated selective pressures in humans. Hancock AM, Witonsky DB, Alkorta-Aranburu G, Beall CM, Gebremedhin A, Sukernik R, Utermann G, Pritchard JK, Coop G, Di Rienzo A. *PLoS Genetics*. 2011

Variation in Human Recombination Rates and its Genetic Determinants. Fledel-Alon A, Leffler EM, Guan Y, Stephens M, Coop G* and Przeworski M.* *PLoS One*. 2011

2012

Scrambling eggs: Meiotic drive and the evolution of female recombination rates. Brandvain Y, Coop G. *Genetics*. 2012

Is your phylogeny informative? Measuring the power of comparative methods Boettiger C, Ralph PL, Coop G *Evolution*. 2012

The effect of recurrent partial sweeps on patterns of neutral diversity Coop G, Ralph PL. *Genetics*. 2012

2013

The *Capsella rubella* genome and the genomic consequences of rapid mating system evolution. Slotte T, Hazzouri KM, Agren JA, Koenig D, Maumus F, Guo YL, Steige K, Platts AE, Escobar JS, Newman LK, Wang W, Mandáková T, Vello E, Smith LM, Henz SR, Steffen J, Takuno S, Brandvain Y, Coop G, Andolfatto P, Hu TT, Blanchette M, Clark RM, Quesneville H, Nordborg M, Gaut BS, Lysak MA, Jenkins J, Grimwood J, Chapman J, Prochnik S, Shu S, Rokhsar D, Schmutz J, Weigel D, Wright SI. *Nature Genetics*. 2013

The geography of recent genealogy across Europe. Ralph PL and Coop G. *PLOS Biology* 2013

Robust Identification of Local Adaptation from Allele Frequencies. Günther T, Coop G. *Genetics*. 2013

Genomic identification of founding haplotypes reveals the history of the selfing species *Capsella rubella*. Brandvain Y, Slotte T, Hazzouri K, Wright SI, Coop G. *PLOS Genetics* 2013

Disentangling the effects of geographic and ecological isolation on genetic differentiation. Bradburd G, Ralph PL, Coop G. *Evolution*. 2013

2014

A Population Genetic Signal of Polygenic Adaptation. Berg JJ, Coop G. *PLOS Genetics* 2014.

Speciation and introgression between *Mimulus nasutus* and *Mimulus guttatus*. Brandvain Y, Kenney A.M., Flagel L, Coop G,* Sweigart A.L*.. *PLOS Genetics* 2014.

2015

Sperm should evolve to make female meiosis fair. Brandvain Y. and Coop G. *Evolution*. 2015.

Complex histories of repeated gene flow in Cameroon crater lake cichlids cast doubt on one of the clearest examples of sympatric speciation Martin C. H., J.S. Cutler, J.P. Friel, C.T. Denning, G. Coop, P. C. Wainwright. *Evolution*. 2015

The role of standing variation in geographic convergent adaptation. Ralph P.L., G. Coop. Accepted *Am. Nat* 2015

The Spatial Mixing of Genomes in Secondary Contact Zones Sedghifar A., Y. Brandvain, P.L. Ralph, G Coop. Accepted, pending minor revisions, *Genetics*

A Coalescent Model of a Sweep from a Uniquely Derived Standing Variant. Berg JJ, G Coop. bioRxiv Accepted Genetics

Preprints (under review or in revision).

A Spatial Framework for Understanding Population Structure and Admixture. Bradburd G., P.L. Ralph, G Coop. bioRxiv. (in revision PLOS Genetics)

A genomic map of the effects of linked selection in *Drosophila*. Elyashiv E., S Sattath, T.T. Hu, A. Strustovsky, G. McVicker, P. Andolfatto, G. Coop, G. Sella. ARxiv. (in revision PLOS Genetics)

Convergent Evolution During Local Adaptation to Patchy Landscapes Ralph P.L., Coop G. bioRxiv. (in revision PLOS Genetics)