

Molecular and Computational Biology
University of Southern California
1050 Childs Way, Rm 201B
Los Angeles, CA 90089-2910

phone (213) 821-2858
fax (213) 740-8631
email cmtoomaj@alumni.uchicago.edu

EDUCATION

Ph. D. (2002) **University of Chicago** - Genetics

Advisor: Martin Kreitman

Dissertation: Detecting recent natural selection at the human hemochromatosis locus (*HFE*) using allele age estimates

B. A. with distinction (1995) **Northwestern University** - Integrated Science (departmental honors) and Biological Sciences

PROFESSIONAL POSITIONS

Postdoctoral Fellow 2003-present **University of Southern California**, Molecular and Computational Biology

GRANTS

USC Center for Excellence in Genome Science Genetic Variation Research Pilot Project Grant (2005-2006) – The effect of intergenic gene conversion between duplicated loci on levels of genome variation. \$25,000

NSF Doctoral Dissertation Improvement Grant (2000-2002) - co-PI M Kreitman, Population genetic processes underlying a common disease allele in humans. \$10,000

FELLOWSHIPS AND AWARDS

NIH NRSA postdoctoral fellowship (2004-2006) Haplotype block structure of the *Arabidopsis* genome.

NIH Genetics Training Grant recipient (2000-2001)

Howard Hughes Medical Institute Predoctoral Fellow (1995-2000)

NSF Predoctoral Fellowship (1995, declined)

Phi Beta Kappa (1995)

Barry M. Goldwater Scholarship (1994-1995)

PUBLICATIONS

Clark, RM, G Schweikert, S Ossowski, G Zeller, **C Toomajian**, P Shinn, N Warthmann, TT Hu, G Fu, DA Hinds, H Chen, KA Frazer, DH Huson, B Schölkopf, M Nordborg, G Rättsch, JR Ecker & D Weigel. Common sequence polymorphisms shaping genetic diversity in *Arabidopsis thaliana*. Submitted to *Science* as a Research Article.

Kim*, SK, V Plagnol*, TT Hu*, **C Toomajian***, RM Clark, S Ossowski, J Ecker, D Weigel & M Nordborg. Recombination and linkage disequilibrium in *Arabidopsis thaliana*. Submitted to *Science* as a Report. (*co-first authors)

Zhao, K, MJ Aranzana, S Kim, C Lister, C Shindo, C Tang, **C Toomajian**, H Zheng, C Dean, P Marjoram & M Nordborg. An *Arabidopsis* example of association mapping in structured samples. *PLoS Genet* In press. DOI 10.1371/journal.pgen.0030004.eor

Bakker, EG, **C Toomajian**, M Kreitman & J Bergelson 2006. A genome-wide survey of *R* gene polymorphisms in *Arabidopsis*. *Plant Cell* **18**: 1803-1818.

Toomajian C, TT Hu, MJ Aranzana, C Lister, C Tang, H Zheng, K Zhao, P Calabrese, C Dean & M Nordborg 2006. A nonparametric test reveals selection for rapid flowering in the *Arabidopsis* genome. *PLoS Biol* **4**: e137.

- Bakker, EG, EA Stahl, **C Toomajian**, M Nordborg, M Kreitman & J Bergelson 2006. Distribution of genetic variation within and among local populations of *Arabidopsis thaliana* over its species-range. *Mol Ecol* **15**: 1405-1418.
- Aranzana, MJ, S Kim, K Zhao, E Bakker, M Horton, K Jakob, C Lister, J Molitor, C Shindo, C Tang, **C Toomajian**, B Traw, H Zheng, J Bergelson, C Dean, P Marjoram & M Nordborg 2005. Genome-wide association mapping in *Arabidopsis* identifies previously known flowering time and pathogen resistance genes. *PLoS Genet* **1**: e60.
- Nordborg, M, TT Hu, Y Ishino, J Jhaveri, **C Toomajian et al.** 2005. The pattern of polymorphism in *Arabidopsis thaliana*. *PLoS Biol* **3**: e196.
- Toomajian, C**, RS Ajioka, LB Jorde, JP Kushner & M Kreitman 2003. A method for detecting recent selection in the human genome from allele age estimates. *Genetics* **165**: 287-297.
- Toomajian, C** & M Kreitman 2002. Sequence variation and haplotype structure at the human *HFE* locus. *Genetics* **161**: 1609-1623.
- Di Rienzo, A, P Donnelly, **C Toomajian**, B Sisk, A Hill, ML Petzl-Erler, GK Haines & DH Barch 1998. Heterogeneity of microsatellite mutations within and between loci, and implications for human demographic histories. *Genetics* **148**: 1269-1284.

PUBLICATIONS IN PREPARATION

- Toomajian, C**, PP Calabrese, K Zhao, C Lister, C Dean & M Nordborg. A universal SNP set for studying crosses of *Arabidopsis thaliana*.
- Tang, C, SL Sherman-Broyles, V Plagnol, **C Toomajian**, YL Guo, R Clark, D Weigel, J Nasrallah & M Nordborg. No recent selection for selfing in *Arabidopsis thaliana*.
- Bakker, EG, MB Traw, **C Toomajian**, M Kreitman & J Bergelson. Polymorphism patterns of genes that control the activation of defense response in *Arabidopsis thaliana*.

ORAL PRESENTATIONS AND INVITED TALKS

- 2006 USC Molecular and Computational Biology Retreat, Laguna Beach, CA.** *Arabidopsis thaliana* genome diversity and natural selection.
- 2006 17th International Conference on Arabidopsis Research, Madison, WI.** Recent selection in the *Arabidopsis* genome: *FRIGIDA* and beyond.
- 2006 Annual Meeting, Society for Molecular Biology and Evolution, Tempe, AZ.** A nonparametric test reveals recent selection for rapid flowering in the *Arabidopsis thaliana* genome.
- 2005 10th Congress of European Society for Evolutionary Biology, Krakow, Poland.** A genome-wide scan for local natural selection in *Arabidopsis thaliana*.
- 2004 15th International Conference on Arabidopsis Research, Berlin, Germany.** The genomic pattern of polymorphism in *Arabidopsis thaliana*.
- 2004 Keystone Symposium- Human Genome Sequence Variation and the Inherited Basis of Common Disease, Breckenridge, Colorado** The pattern of polymorphism in the *Arabidopsis* genome. (invited talk, in place of M Nordborg)
- 2002 Laboratory of Genomic Diversity, National Cancer Institute, Frederick, MD.** Evidence of recent selection in humans from patterns of linkage disequilibrium. (invited talk)
- 2002 Department of Biology, University of Rochester, Rochester, NY.** Evidence of recent selection in humans from patterns of linkage disequilibrium. (invited talk)
- 2001 Annual meeting, Society for the Study of Evolution, Knoxville, TN.** Testing for recent positive selection on a human disease mutation using extent of haplotype sharing.
- 1999 Annual meeting, Society for the Study of Evolution, Madison, WI.** A population genetic analysis of nucleotide sequence variation from an 11.2 kb region of the HLA-linked human hemochromatosis locus.

TEACHING

Experience:

Teaching assistant, University of Chicago

Graduate courses - Human Genetics (spring 1998), Cell Biology I (fall 1996)

Undergraduate courses - Human Genetics (winter 1998), Evolutionary Biology (spring 1996)

Tutor, Northwestern University Integrated Science Program (1992-1994) – science and mathematics

Tutor, The Blue Gargoyle Adult Learning Program (1997-2001) – mathematics, literacy.

Teaching interests: Genetics, Population Genetics, Evolutionary Genetics, Molecular Evolution, Genomics.

SERVICE

Peer review – Genetics, Genome Research, Journal of Molecular Evolution, Molecular Biology and Evolution, Molecular Ecology, Plant Physiology, Public Library of Science Biology, Trends in Ecology and Evolution

Graduate student representative – Committee on Genetics, University of Chicago 1996-1999

REFERENCES

Magnus Nordborg, Ph. D. **Postdoctoral advisor**

Associate Professor
Department of Biology
University of Southern California
1050 Childs Way, Rm 201B
Los Angeles, CA 90089-2910
Phone: (213) 821-5349
Fax: (213) 740-8631
Email: magnus@usc.edu

Martin Kreitman, Ph. D. **Ph. D. advisor**

Professor
Department of Ecology and Evolution
University of Chicago
1101 E. 57th St.
Chicago, IL 60637
Phone: (773) 702-1222
Fax: (773) 702-9740
Email: mkre@uchicago.edu

Detlef Weigel, Ph. D. **Collaborator**

Professor
Department of Molecular Biology
Max Planck Institute for Developmental Biology
Spemannstrasse 37-39
D-72076 Tübingen
Germany
Phone: 01149-7071-601 1411
Fax: 01149-7071-601 1409
Email: weigel@weigelworld.org

Anna Di Rienzo, Ph. D. **Ph. D. committee member**

Associate Professor
Department of Human Genetics
University of Chicago
CLSC 507F
920 E. 58th St.
Chicago, IL 60637
Phone: (773) 834-1037
Fax: (773) 834-0505
Email: dirienzo@genetics.uchicago.edu