Joshua A Shapiro

Princeton University
Lewis-Sigler Institute
for Integrative Genomics

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RESEARCH INTERESTS

- Causes and consequences of genotypic and phenotypic diversity
- Evolution of expression patterns and expression regulation
- Genomic signatures of selection and demography
- Processes underlying population structure and speciation

EDUCATION

Ph.D. University of Chicago Department of Ecology and Evolution 2007
Dissertation: Selection and Structure in *Drosophila* Populations During the Process of Speciation
Advisor: Dr. Chung-I Wu

B.A. Williams College Biology 1998
Summa Cum Laude with Highest Honors
Thesis: Population Structure and Gene Flow in Chorus Frog Tadpoles (*Pseudacris triseriata*) on North Government Island
Advisor: Dr. David Smith

RESEARCH EXPERIENCE

Post-Doctoral Research Associate 2006-present
Lewis-Sigler Institute for Integrative Genomics, Princeton University

- Examined global diversity of yeast using whole-genome polymorphism data.
- Conducted genome-wide association studies of gene expression variation in yeast.
- Designed custom microarrays for gene expression analysis and genotyping.
- Developed methods for accurate SNP identification in large samples of individuals.
- Implemented database and analysis methods for short-read sequence data.

Advisor: Dr. Leonid Kruglyak

Graduate Research 2000-2006
Department of Ecology and Evolution, University of Chicago

- Designed and analyzed large-scale sequencing study of *Drosophila* populations.
- Developed methods for the detection of adaptive evolution and population divergence.
- Examined gene expression changes in *Drosophila* species hybrids.

Advisor: Dr. Chung-I Wu

Laboratory Technician 2000
Department of Cell Biology, University of Virginia
- Oversaw maintenance of a transgenic mouse colony.
- Performed genetic analyses using standard molecular biological techniques.

Supervisor: Dr. P. Prabhakara Reddi

Fulbright Scholar 1999
Centre for Research on Introduced Marine Pests, CSIRO, Australia
- Conducted and analyzed field and laboratory studies of invasive marine organisms.

Supervisor: Dr. Craig Proctor

Undergraduate Honors Research 1997-1998
Department of Biology, Williams College
- Analyzed population structure of *P. triseriata* tadpoles using RAPD markers and tailfin morphology.
- Constructed a detailed map of the rock shore habitat using GIS software.

Advisor: Dr. David Smith

TEACHING EXPERIENCE

Visiting Assistant Professor Bryn Mawr College 2011-present
Genomics and Bioinformatics
- Designed and taught lectures and laboratory exercises covering historical and modern approaches to bioinformatics and genomic analysis.

Lecturer Princeton University 2008-2009
Genes, Health and Society
- Conducted weekly precept sections for undergraduates, discussing the science of genetics and its implications for medicine and society as a whole.

Guest Lecturer Princeton University 2007
Topics in Evolution
- Presented tutorial for graduate and undergraduate students in use of R software for statistical analysis.

Guest Lecturer University of Chicago 2005
Population Genetics
- Lectured graduate students on statistical tests for natural selection and the use of those tests in published and ongoing research.

Laboratory Instructor University of Chicago 2002
Ecology & Evolution
- Led laboratory activities for undergraduates, evaluated student work, and provided tutorials on course material as needed.

Teaching Assistant University of Chicago 2001
Grants, Publications & Professional Issues
- Assisted graduate students with preparation of fellowship applications, both with formulating research proposals and communicating their ideas in writing.

Teaching Assistant Williams College 1995-1998
The Cell, Physiology
- Assisted with laboratory instruction.

Teaching Assistant Northfield Mount Hermon Summer Session 1995
Marine Biology & Scuba Program
• Assisted with lectures, laboratory instruction, and field trips.

PUBLICATIONS

JA Shapiro, J Schacherer, L Kruglyak (in preparation) Association mapping of gene expression variation in *Saccharomyces cerevisiae.*

JP Gerke*, EC Andersen*, **JA Shapiro***, JR Crissman, R Ghosh, JS Bloom, M-A Félix, L Kruglyak (submitted) Chromosome-scale selective sweeps shape *Caenorhabditis elegans* genomic diversity.

Y Fu*, HI Wang*, **JA Shapiro***, X-M Lu, A Greenberg, S Fang, M-L Wu, W Huang, A Xu, C-I Wu (submitted) Rapid evolution in DNA sequences, expression and behavior in the non-African populations of *Drosophila melanogaster.*

X-M Lu*, **JA Shapiro***, C-T Ting, Y Li, C Li, J, Xu, Y-J Chen, AJ Greenberg, S-H Li, C-I Wu (2010) Genome-wide mis-expression of X-linked vs. autosomal genes associated with hybrid male sterility.
Genome Research 20: 1097-1102

IM Ehrenreich, N Torabi, Y Jia, J Kent, S Martis, **JA Shapiro**, D Gresham, A Caudy, L Kruglyak (2010) Dissection of genetically complex traits with extremely large pools of yeast segregants.
Nature 464:1039-1042

J Schacherer*, **JA Shapiro***, DM Ruderfer, L Kruglyak (2009) Comprehensive polymorphism survey elucidates population structure of *Saccharomyces cerevisiae*.
Nature 458:342-345

MH Kohn, **JA Shapiro**, C-I Wu (2008) Decoupled differentiation of gene expression and coding sequence among *Drosophila* populations.
Genes & Genetic Systems 83: 265-273

JA Shapiro, W Huang, C Zhang, J Lu, DA Turissini, S Fang, H-Y Wang, RR Hudson, C-I Wu (2007) Adaptive genic evolution in the *Drosophila* genomes.
Proceedings of the National Academy of Sciences USA 104:2271-2276

S Lee, J Bao, G Zhou, **JA Shapiro**, J Xu *et al.* (2005) Detecting novel low-abundant transcripts in *Drosophila.*
RNA 11: 939-946

PP Reddi, AM Shore, **JA Shapiro**, A Anderson, MH Stoler, KK Acharya (2003) Spermatid-specific promoter of the SP-10 gene functions as an insulator in somatic cells.
Developmental Biology 262:173-182

*Equal authorship contribution

PRESENTATIONS

A survey of global *C. elegans* diversity by RAD-Seq.
2nd UK RAD Sequencing Meeting, August 2010, invited speaker

Selective effects of polymorphisms affecting gene expression in a global sample of *Saccharomyces cerevisiae.*
Annual Meeting of the Society for Molecular Biology and Evolution 2010, poster

Genome-wide association mapping of gene expression variation in *S. cerevisiae.*
Annual Meeting of the Society for Molecular Biology and Evolution 2009, poster

Association mapping of gene expression in *Saccharomyces cerevisiae.*
Gordon Research Conference on Quantitative Genetics 2009, poster

Analysis and mapping of gene expression variation in *Saccharomyces cerevisiae*.
Yeast Genetics and Molecular Biology Meeting 2008, poster

Gene expression variation in *Saccharomyces cerevisiae*
Evolution 2008, platform presentation

Population structure and evolutionary history of *Saccharomyces cerevisiae.*
Cold Spring Harbor Labs: The Biology of Genomes 2007, poster

Genetic differentiation between behavioral races of *Drosophila melanogaster*.
Drosophila Research Conference 2005, platform presentation

Changes in gene expression associated with *Ods* introgression-induced hybrid male sterility.
Drosophila Research Conference 2004, poster

HONORS, AWARDS & AFFILIATIONS

Post-Doctoral Poster Prize, Annual Meeting of the Society for Molecular Biology and Evolution 2009
Howard Hughes Medical Institute Pre-Doctoral Fellowship in Biological Sciences 2001-2006
NSF Graduate Research Fellowship (Declined) 2000
Honorable Mention NSF Graduate Research Fellowship 1999
Fulbright Award (U.S. Student Program) Full grant to Australia 1999
Erastus C Benedict Prize in Biology, Williams College 1998
Phi Beta Kappa
Sigma Xi
Genetics Society of America
Society for the Study of Evolution
Society for Molecular Biology and Evolution