ASHLEY I. TEUFEL

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RESEARCH INTERESTS

Computation and mathematical modeling at the interface of molecular evolution and population dynamics.

EDUCATION

11/2015-present	Postdoctoral fellow, University of Texas at Austin (Austin, TX) Advisor: Prof. Claus Wilke
10/2015	Ph.D., Molecular Biology, University of Wyoming (Laramie, WY) Advisor: Prof. David Liberles Dissertation Title: "Mechanistic Models for Gene Duplication"
12/2007	B.S., Mathematics, Minor Bioinformatics, New Mexico State University (Las Cruces, NM)
05/2006	B.S., Computer Science, Minor Mathematics, New Mexico State University (Las Cruces, NM)

EXPERIENCE

02/2015-09/2015	Visiting research fellow, Department of Biology, Temple University (Philadelphia, PA) Advisor: Prof. David Liberles (relocated from U. Wyoming)
06/2012-08/2012	Visiting summer student of computational biology, University of Oxford (Oxford, UK) Advisor: Prof. Jotun Hein
05/2008-05/2010	M.S. student, Biology, Minor Mathematics, New Mexico State University (Las Cruces, NM) (Resigned position to begin Ph.D. studies at U. Wyoming) Advisor: Prof. Brook Milligan

PUBLICATIONS

Teufel, A.I., Wilke, C.O., 2017 "Accelerated Simulations of Evolutionary Trajectories in Origin-Fixation Models" Journal of The Royal Society Interface, 14:127

Teufel, A.I., Liang, L., Liberles, D.A., 2016 "Models for Gene Duplication when Dosage Balance Works as a Transition State to Subsequent Neo or Subfunctionalization" BMC Evolutionary Biology, 16:45-51

Orlenko, A.*, **Teufel, A.I.***, Liberles, D.A., 2016 "Flux-dependent Selection on Metabolic Pathway Function in the Presence of Mutation-selection Balance Leads to Rate-limiting Steps that are not Evolutionary Stable" Biology Direct, 11:31

Teufel, A., Masel, J., Liberles, D.A., 2015 "What Fraction of Duplicates Observed in Recently Sequenced Genomes of Segregating and Destined to Fail to Fix?" Genome Biology and Evolution, 7:2258-2264

Zhao, J., **Teufel, A.**, Liberles, D.A., Liu, L. 2015 "A Generalized Birth and Death Process for Modeling the Fates of Gene Duplication" BMC Evolutionary Biology, 15:275-286

Teufel, A.I., Zhao, J., O'Reilly, M., Liu, L., Liberles, D.A., 2014. "On Mechanistic Modeling of Gene Content Evolution: Birth-Death Models and Mechanisms of Gene Birth and Gene Retention" Computation 2:112-130

Liberles, D. A., **Teufel, A.I.**, Liu, L., Stadler, T., 2013. "On the Need for Mechanistic Models in Computational Genomics and Metagenomics" Genome Biology and Evolution, 5:2008-2018

Jones, M.*, Forester, B.*, **Teufel, A.**, Adams, R., Anstett, D., Goodrich, B., Joost, S., Manel, S., 2013. "Integrating Landscape Genomics and Spatially Explicit Approaches to Detect Loci Under Selection in Clinal Population" Evolution, 67:3455-3468

Liberles, DA, Teichmann, S, Bahar I, Bastolla U, Bloom J, Bornberg-Bauer E, Colwell LJ, de Koning APJ, Dokholyan NV, Echave J, Elofsson A, Gerloff DL, Goldstein RA, Grahnen JA, Holder M, Lakner C, Lartillot N, Lovell S, Naylor G, Perica T, Pollock DD, Pupko T, Regan L, Roger A, Rubinstein N, Shakhnovich E, Sjolander E, Sunyaev S, **Teufel AI**, Thorne JL, Thornton JW, Weinreich DM, Whelan S. 2012. "The Interface of Protein Structure, Protein Biophysics, and Molecular Evolution" Protein Science, 21:769-785

Teufel, A.I., Grahnen, J.A., and Liberles, D.A. "Modeling Proteins at the Interface of Structure, Evolution, and Population Genetics" in Computational Modeling of Biological Systems: From Molecules to Pathways (Ed: Dokholyan). New York: Springer-Verlag, 2012

Konrad, A.*, **Teufel, A.I.***, Grahnen, J.A., and Liberles, D.A. 2011. "Towards a General Model for the Evolutionary Dynamics of Gene Duplicates." Genome Biology and Evolution, 3:1197-1209

PRESENTATIONS

"Uncovering Replication Principles from Single-cell Virology Experiments", Society for Molecular Biology and Evolution (SMBE) Annual Meeting, Austin, TX (July, 2017)

"Protein Flexibility and the Irreversibility of Evolution" Texas Protein Folders Meeting, Cleveland, TX (April, 2017)

"Functional Retention of Protein-Protein Interactions Despite Substantial Sequence Divergence" BEACON Center for the Study of Evolution in Action, Lansing, MI (August, 2016)

"Functional Retention of Protein-Protein Interactions Despite Substantial Sequence Divergence" Society for Molecular Biology and Evolution (SMBE) Annual Meeting, Gold Coast, Australia (July, 2016)

"What Fraction of Gene Duplicates Observed in Recently Sequenced Genomes is Segregating and Destined to Fail to Fix?"
Lehigh Valley Ecology and Evolution Symposium, Allentown, PA (April, 2015)

"Selective Pressures on Amino Acid Substitutions During Human-Chimpanzee Divergence" Society for Molecular Biology and Evolution (SMBE) Annual Meeting, Chicago, IL (July, 2013)

"Selective Pressures on Amino Acid Substitutions During Human-Chimpanzee Divergence" Workshop Quantitative Laws of Genome Evolution, Lake Como, Italy. (July, 2013)

"Towards a General Model for the Evolutionary Dynamics of Gene Duplicates" Stockholm Bioinformatics Center, Stockholm University, Stockholm, Sweden. (August, 2012)

"The Interface of Evolutionary Dynamics of Gene Duplicates and Landscape Genetics" Symposium on Landscape Genetics, University of Toronto, Toronto, Canada. (May, 2012)

"Towards a General Model for the Evolutionary Dynamics of Gene Duplicates" Mechanisms of Protein Evolution I, University of Colorado Health Sciences Center, Denver, CO (December, 2011)

"Lineage-Specific Substitution Patterns at the Interface of Effective Population Size, Linkage, and Biochemistry" Synthesis Meeting on Modeling Protein Structural and Energetic Constraints on Sequence Evolution, NIMBioS, Durham, NC (October, 2011)

"Unifying Models for Estimating Population Size and Demography"
New Mexico State University Bio-Symposium, Las Cruces, NM (April, 2010)

"Spatial-Temporal Models of Primate Behavior"
New Mexico State University Anthropology Department, Las Cruces, NM (May, 2009)

POSTERS

"Translational Efficiency and The Evolution of Position-Dependent Codon Usage"
Presented by undergraduate trainee: Nelson Morrow
Society for Molecular Biology and Evolution (SMBE) Annual Meeting, Austin, TX (July, 2017)

"Accelerated Simulation of Evolutionary Trajectories in Origin--Fixation Models"
Institute for Cellular & Molecular Biology at UT Austin Retreat, Horseshoe Bay, TX
(September, 2016)

"Selective Pressures on Amino Acid Substitutions During Human-Chimpanzee Divergence"
NSF Bioinformatics Workshop, Little Rock, AR (March, 2013) **(3rd place poster award)**

"Simulation of Evolutionary Dynamics of Gene Duplicates"
New Mexico Bioinformatics Science and Technology Symposium, Santa Fe, NM (October, 2012)

JOURNALS REVIEWED FOR

PLoS ONE, BMC Evolutionary Biology, Journal of Molecular Evolution, Systematic Biology

TEACHING EXPERIENCE

4/2017	Substitute Teacher, Computational Biology and Bioinformatics, University of Texas at Austin, (Lecture on sequence alignment methods)
1/2013-5/2014	Teaching Assistant, Bioinformatics, University of Wyoming, (Two lectures on machine learning)
8/2013-12/2013	Teaching Assistant, Computers in Biology, University of Wyoming
1/2012-5/2012	Teaching Assistant, Bioinformatics, University of Wyoming
8/2011-12/2011	Teaching Assistant, Computers in Biology, University of Wyoming
1/2005-5/2010	Laboratory Proctor, Computer Science, New Mexico State University
5/2009-7/2009	Teaching Assistant, Mathematics in Biology New Mexico State University

OTHER AWARDS AND ACTIVITIES

Co-chair Society for Molecular Biology and Evolution (SMBE) "Mechanisms of Protein Evolution" Symposium (July, 2017)

Funded Fellowship for the Pop-Up Institute "Seeing the Tree and the Forest: Understanding Individual and Population Variation in Biology, Medicine, and Society" (May, 2017)

Second Place in Flaming Gorge Jalapeno Eating Contest, Laramie, WY (July, 2014)

President of the New Mexico State ACM (Association for Computing Machinery) (2009-2010)

Member of the New Mexico State Mathematics Honor Society, PME (Pi Mu Epsilon) (2005-2010)

Featured in New Mexico State YWiC (Young Women in Computing) Fall Newsletter (2009)

Vice President of the New Mexico State ACM (Association for Computing Machinery) (2008-2009)