Abhilesh **Dhawanjewar**

Research Fellow · Genetics, Evolution and Environment · University College London

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Education

Ph.D. in Evolutionary Biology *Aug 2015 - Jul 2022*

University of Nebraska-Lincoln, USA

Advisors: Dr. Kristi Montooth & Dr. Colin Meiklejohn

Integrated B.S.-M.S. Dual Degree *Aug 2010 - May 2015*

Indian Institute of Science Education and Research, Pune, India

Advisor: Dr. M.S. Madhusudhan

Skills

Programming Python, R, Bash, slurm, LaTeX, Eidos

DevOPs Docker, Kubernetes, NGINX

Analysis Sequence Analysis, Protein Structure, Phylogenetics, Mixed-Effect Models, Bayesian Computation

Publications

Journal Articles

M. Florencia Camus & **Dhawanjewar, A.S.** (2023). Multilevel selection on mitochondrial genomes. *Current Opinion in Genetics & Development, 80, 102050.*

Dhawanjewar A.S.*, Roy A.A.*, & Madhusudhan M.S. (2020). A knowledge-based scoring function to assess the stability of quaternary protein assemblies. *Oxford Bioinformatics, 36(12), 3739-3748.*

Roy, A.A.*, **Dhawanjewar, A.S.***, Sharma, P., Singh, G., & Madhusudhan, M.S. (2019). Protein Interaction Z Score Assessment (PIZSA): an empirical scoring scheme for evaluation of protein-protein interactions. *Nucleic acids research, 47(W1), W331-W337.*

Montooth, K.L., **Dhawanjewar, A.S.**, & Meiklejohn, C.D. (2019). Temperature-sensitive reproduction and the physiological and evolutionary potential for Mother's Curse. *Integrative and comparative biology, 59(4), 890-899.*

Nelson, T.C., Jones, M.R., Velotta, J.P., **Dhawanjewar, A.S.**, & Schweizer, R.M. (2019). UNVEILing connections between genotype, phenotype, and fitness in natural populations. *Molecular ecology, 28(8), 1866-1876.*

** Equal contribution*

Web-servers

Prediction of Stable Quaternary Protein Assemblies -
PIZSA (Protein Interaction Z-score Assessment) - http://cospi.iiserpune.ac.in/pizsa/

Experience

The Evolution of Sexually Antagonistic Variation in Fruit Flies *2022-Present*

University College London *UK*

— Designed experiments to implement sex-limited selection in *Drosophila melanogaster* to identify sexually antagonistic loci
— Run forward-in-time simulations replicating the experimental design for power analysis and to identify optimal experimental parameters
— Perform genome-wide pooled sequencing of replicate populations to track allele frequency over time
— Implement Approximate Bayesian Computation (ABC) to identify sexually antagonistic polymorphisms from temporal allele frequency data

Estimating Levels of Molecular Compensation in the Oxidative Phosphorylation System *2019-2021*

University of Nebraska-Lincoln *USA*

— Constructed computational pipeline to identify instances where mitochondrial disease-causing mutations are present as native resides in 1200 mammalian species
— Performed sequence correlation analysis using corrected mutual information to characterize inter- and intra-genomic correlations
— Constructed phylogenies and performed ancestral state reconstruction to identify potential compensating residues
— Built protein structural models using homology modelling to identify nature of structural compensation
— Performed protein stability estimations for characterizing the effect of disease-causing mutations on overall protein stability
— Estimated evolutionary rate correlations between mitochondrial and nuclear genes to detect mito-nuclear coevolution

Mitochondrial-Nuclear Interactions and the Thermal Sensitivity of Male Reproduction *2016-2019*

University of Nebraska-Lincoln *USA*

— Characterized thermal male sterility for a panel of six hybrid Mitochondrial-Nuclear genotypes combining mitochondrial and nuclear DNA from *Drosophila melanogaster* and *Drosophila simulans*
— Assayed male fertility in a factorial design across three different temperatures and with males raised on three different diets to identify environmental effects on male fertility
— Ran mixed-model linear regressions to analyse the variance of genetic as well as environmental effects on male fertility results
— Found significant GxGxExExE interctions shaping sharp thermal sterility thresholds in *Drosophila*

Prediction of Stable Quaternary Assemblies Protein Interaction Z Score Assessment (PIZSA) *2013-2015*

Indian Institute of Science Education and Research, Pune *India*

— Constructed knowledge-based statistical potentials trained over 4900 native three-dimensional protein structures
— Derived a scoring scheme based on the statistical potentials and a binary classification scheme for identification of native protein quaternary structures
— Extensively bench-marked across multiple test sets and is among the top 6 methods, outperforming 31 other statistical, physics, based and machine learning scoring schemes
— Deployed the algorithm as a web-server

Honors & Awards

Blair Paxton Udale Fund for Life Sciences, **The University of Nebraska Foundation ($1900)**	2021
Milton E. Mohr Fellowship, **UNL Center for Biotechnology ($1000)**	2021
Blair Paxton Udale Fund for Life Sciences, **The University of Nebraska Foundation ($500)**	2020
Milton E. Mohr Fellowship, **UNL Center for Biotechnology ($1000)**	2019
Suzanne O. Prather Memorial Fund, **University of Nebraska Foundation ($1500)**	2019
Runner-Up Best Poster Award, **School of Biological Sciences, UNL ($50)**	2019
AAAS/Science Program for Excellence in Science, **American Association for the Advancement of Science**	2019
Jessie A. Lee Fund, **School of Biological Sciences, UNL ($2000)**	2018
Best Poster Award, **School of Biological Sciences, UNL ($100)**	2018
Conference Registration Award, **Society for Molecular Biology and Evolution ($450)**	2018
Travel Grant, **Society for Molecular Biology and Evolution ($250)**	2017
Runner-Up Best Poster Award, **School of Biological Sciences, UNL ($50)**	2017
Mary D. Rogick Memorial Fund, **School of Biological Sciences, UNL ($1300)**	2017
Travel Grant, **Society for the Study of Evolution ($500)**	2016
Blair Paxton Udale Fund for Life Sciences, **The University of Nebraska Foundation ($1500)**	2016
Rosemary Grant Award, **Society for the Study of Evolution ($2500)**	2016
Travel Grant, **The Indian Institute of Science Education and Research, Pune ($1300)**	2014
Travel Grant, **The American Society of Naturalists ($250)**	2014
Working Internship, **Max Planck Institute for Evolutionary Biology ($3500)**	2013
INSPIRE Scholarship, **Department of Science and Technology, India ($8000)**	2010
National Talent Search Examination (NTSE) Scholar, **NCERT, India ($250)**	2006

Conference Presentations

Invited Talks

The Ethics of Using Genetic Tools for Conservation — *Jun 2018*
UNVEIL Symposium 2018 — *Missoula, Montana, USA*

Population Genomics of the Range-Expanding Populations of *Argiope bruennichi* — *Jul 2016*
20TH International Congress of Arachnology — *Golden, Colorado, USA*

Oral Presentations

Compensatory Evolution of Disease Associated Residues in the Oxidative Phosphorylation (OXPHOS) pathway * — *Jun 2020*
Society for Molecular Biology and Evolution Meeting — *Québec City, Canada*

Environmental Modification of Mitochondrial-Nuclear Epistasis in Shaping Thermal Male Sterility in *Drosophila* — *Jun 2018*
UNVEIL Symposium 2018 — *Missoula, Montana, USA*

Mitochondrial-Nuclear Interactions and the Thermal Sensitivity of Male Reproduction — *Sep 2017*
Mitochondrial Genomics and Evolution, an SMBE Satellite Meeting — *Ein Gedi, Israel*

Poster Presentations

Compensatory Evolution of Disease Associated Residues in the Mitochondrial Genome — *Oct 2019*
2ND UNVEIL Symposium 2019 — *Lincoln, Nebraska, USA*

Structural Compensation of Disease Associated Residues in the Mitochondrial Genome — *Aug 2019*
European Society for Evolutionary Biology Meeting — *Turku, Finland*

Mitochondrial Diseases and Compensated Pathogenic Deviations — *Jan 2019*
Society for Integrative and Comparative Biology Meeting — *Tampa, Florida, USA*

Genetic and Environmental Factors Underlying the Thermal Sensitivity of Male Reproduction — *Jul 2018*
Society for Molecular Biology and Evolution Meeting — *Yokohama, Japan*

Mitochondrial-Nuclear Interactions and the Thermal Sensitivity of Male Reproduction — *Apr 2017*
University of Nebraska-Lincoln Spring Research Fair — *Lincoln, Nebraska, USA*

Mitochondrial-Nuclear Interactions and the Thermal Sensitivity of Male Reproduction — *Mar 2017*
58TH Annual Drosophila Research Conference — *San Diego, California, USA*

Prediction of Protein-Protein Interactions through the use of Statistical Potentials — *Mar 2015*
BioPhysics Paschim Meeting — *Mumbai, India*

Comparative Mitogenomic Analysis in the Range-Expanding Populations of *Argiope bruennichi* — *Sep 2014*
QEvolution2014, Workshop on Quantitative Evolutionary Biology — *Şirince, Turkey*

** Conference cancelled due to COVID-19 concerns*

Outreach

Organiser & Lightning Talks and Film Festival Master of Ceremonies, **SciComm 2020**	2020
My Captain Discover Mentor, **The Climber**	2018
Scientists in Cars Getting Coffee, **Film Festival, SciComm 2018**	2018
Master of Ceremonies, Lighting Talks and Film Festival, **SciComm 2018**	2018
Boys and Girls Science Club, Park Middle School, **Lincoln Community Learning Centers**	2016-2017
Junior Sunday with a Scientist, **Nebraska State Museum**	2017
Sunday with a Scientist: Diversity of Life in Nebraska, **Nebraska State Museum**	2017
Sunday with a Scientist: Darwin Day, **Nebraska State Museum**	2017
Science Night Live Moderator, **SciComm 2016**	2016
Sunday with a Scientist: Evolution on the Wing, **Nebraska State Museum**	2016
Junior Sunday with a Scientist, **Nebraska State Museum**	2016
Investigate: Show-and-tell Amblypygi, **Nebraska State Museum**	2016
Science Tutoring for less-privileged high school students, **Pune, India**	2013-2015

Teaching

Guest Lecture, **BIOL0011 - Evolutionary Genetics**	Spring 2023
Teaching Assistant, **LIFE 120L - Fundamental Biology Lab I**	Fall 2021 - Spring 2022
Guest Lecture, **BIOS 897- Communicating Science Through Outreach**	Spring 2017, 2018
Teaching Assistant, **LIFE 121L - Fundamental Biology Lab II**	Fall 2020
Teaching Assistant, **LIFE 120L - Fundamental Biology Lab I**	Spring 2019
Teaching Assistant, **LIFE 120L - Fundamental Biology Lab I**	Fall 2016 - Fall 2017
Teaching Assistant, **BIOS 101L - General Biology Lab**	Fall 2015 - Spring 2016

Professional Service

Postdoctoral Representative, **Genetics, Evolution and Environment, UCL**	2022-Present
Organizing Committee, **SciComm 2020: A Conference on Effective Science Communication**	2020
Graduate Student Representative, **UNL oSTEM Conference 2020**	2020
Workshop co-organizer: Ethics of Biotechnology Applications to Conservation Biology, **UNVEIL Symposium 2018**	2018
Grad Student Volunteer, Strategic Vision Committee, **School of Biological Sciences, UNL**	2018
Vice President, **Biology Graduate Students Association, UNL**	2017-2019
Undergraduate Poster Judge, **UNL Spring Research Fair**	2018-2021

Memberships

Society for Molecular Biology and Evolution (SMBE)	2018-2023
European Society for Evolutionary Biology (ESEB)	2019-2020
The Society for Integrative and Comparative Biology (SICB)	2019-2020
American Association for the Advancement of Science (AAAS)	2019-2020
Genetics Society of America (GSA)	2017-2019
Society for the Study of Evolution (SSE)	2016-2019
International Society of Arachnologists (ISA)	2016-2017
American Society of Naturalists (ASN)	2014-2015

References

Prof. Max Reuter
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Prof. Kristi Montooth
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Dr. Colin Meiklejohn
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