

JESSICA SILTBERG-LIBERLES, PH.D.

Assistant professor

08/2013-current

Department of Biological Sciences

Biomolecular Sciences Institute

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EDUCATION

University of Bergen, Norway

Ph.D. Computational Biology. 2008

Molecular evolution and structural bioinformatics: evolution of regulatory properties in the aromatic amino acid hydroxylase protein family

Stockholm University, Stockholm Bioinformatics Center, Sweden

M.Sc. Biochemistry & Bioinformatics. 2003

Molecular evolution: ancestral sequence reconstruction

ACADEMIC EXPERIENCE

Bioinformatics Service Core, Director

Senior Research Scientist

Molecular Biology Department

University of Wyoming

06/2009-08/2013

50% Service/50% Research

Postdoctoral Research Associate

Molecular Biology Department

University of Wyoming

08/2008-05/2009

PEER-REVIEWED PUBLICATIONS

1. **Avoiding regions symptomatic of conformational and functional flexibility to identify antiviral targets in current and future coronaviruses.**
Rahaman J, Siltberg-Liberles J.
Genome Biol Evol (first published online October 19, 2016) doi:10.1093/gbe/eww246
2. **Paralog-specific patterns of structural disorder and phosphorylation in the vertebrate SH3-SH2-Tyrosine kinase protein family.**
Dos Santos HG, Siltberg-Liberles J.
Genome Biol Evol 2016; 8 (9):2806-2825.doi: 10.1093/gbe/eww194
3. **The nuanced interplay of intrinsic disorder and other structural properties driving protein evolution.**
Ahrens J, Dos Santos, HG, Siltberg-Liberles J.
Mol Biol Evol 2016; 33 (9): 2248-2256.doi: 10.1093/molbev/msw092

4. **Functional diversification after gene duplication: paralog specific regions of structural disorder and phosphorylation in p53, p63, and p73.**
Dos Santos HG, Nunez-Castilla J, Siltberg-Liberles J.
PLoS ONE 2016;11(3): e0151961. doi: 10.1371/journal.pone.0151961
5. **Engineering adenylate cyclases regulated by near-infrared window light.**
Ryu MH, Kang IH, Nelson MD, Jensen TM, Lyuksyutova AI, Siltberg-Liberles J, Raizen DM, Gomelsky M.
PNAS. 2014;111(28):10167-10172.
6. **Did the prion protein become vulnerable to misfolding after an evolutionary divide and conquer event?**
Richmond K, Masterson P, Ortiz JF, Siltberg-Liberles J.
J Biomol Struct Dyn. 2014;32(7):1074-1084.
7. **Metazoan innovation: from aromatic amino acids to extracellular signaling.**
Kutchko KM, Siltberg-Liberles J.
Amino Acids. 2013;45(2):359-67.
8. **Rapid evolutionary dynamics of structural disorder as a potential driving force for biological divergence in flaviviruses.**
Ortiz JF, MacDonald ML, Masterson P, Uversky VN, Siltberg-Liberles J.
Genome Biol Evol. 2013;5(3):504-13.
9. **Evolution of structurally disordered proteins promotes neofunctionalization.**
Siltberg-Liberles J.
Mol Biol Evol. 2011;28(1):59-62.
10. **Natural and engineered photoactivated nucleotidyl cyclases for optogenetic applications.**
Ryu MH, Moskvina OV, Siltberg-Liberles J, Gomelsky M.
J Biol Chem. 2010;285(53):41501-8.
11. **Piriform spider silk sequences reveal unique repetitive elements.**
Perry DJ, Bittencourt D, Siltberg-Liberles J, Rech EL, Lewis RV.
Biomacromolecules. 2010; 11(11) :3000-06.
12. **Superstoichiometric binding of L-Phe to phenylalanine hydroxylase from *Caenorhabditis elegans*: evolutionary implications.**
Flydal MI, Mohn TC, Pey AL, Siltberg-Liberles J, Teigen K, Martinez A.
Amino Acids. 2010;39(5):1463-75.
13. **Formyl peptide receptors are candidate chemosensory receptors in the vomeronasal organ.**
Liberles SD, Horowitz LF, Kuang D, Contos JJ, Wilson KL, Siltberg-Liberles J, Liberles DA, Buck LB.
PNAS. 2009;106(24):9842-7.
14. **Searching distant homologs of the regulatory ACT domain in phenylalanine hydroxylase.**
Siltberg-Liberles J, Martinez A.
Amino Acids. 2009;36(2):235-49.

15. **The phylogeny of the aromatic amino acid hydroxylases revisited by characterizing phenylalanine hydroxylase from *Dictyostelium discoideum*.**
Siltberg-Liberles J, Steen IH, Svebak RM, Martinez A.
Gene. 2008;427(1-2):86-92.
16. **Allosteric mechanisms in ACT domain containing enzymes involved in amino acid metabolism.**
Liberles JS, Thórolfsson M, Martínez A.
Amino Acids. 2005;28(1):1-12.
17. **A simple covarion-based approach to analyse nucleotide substitution rates.**
Siltberg J and Liberles DA.
J. Evol. Biol. 2001;15(4) :588-94.

PRESENTATIONS

Computational Molecular Biology: Deciphering the Past from the Current, To Prepare for the Future, March 2016, Presented by Dr. Jessica Siltberg-Liberles with graduate students Joseph Ahrens and Janelle Nunez-Castilla), Conference for Undergraduate Research at FIU, Florida International University, Miami, FL

Time-travels in Protein Space, Nov 2015, Department of Biology, University of Miami, Miami, FL

Functional Diversification through Rearranged Regions of Structural Disorder in the p53 family, Nov 2015, Society for Molecular Biology and Evolution's satellite meeting "Mechanisms in Protein Evolution III", Denver, CO

Structural and Evolutionary Dynamics, Jan 2015, CaMBIO, Florida International University, Miami, FL

Structural and Evolutionary Dynamics, Oct 2014, SAMSI – Beyond Bioinformatics – Dependence of Phylogenetic Models, online to participants at Duke, UNC, UCL, etc.

Time-travels in Protein Space, Apr 2014, Department of Physics, Florida International University, Miami, FL

Evolutionary dynamics of conformational flexibility in the prion protein and its remote homologs, Jul 2012, DYPROT (The Emerging Dynamic View of Proteins: Protein Plasticity in Allostery, Evolution, and Self-Assembly), Max Planck Institute workshop, Dresden, Germany

Evolutionary dynamics of conformational flexibility, Jun 2013, The Albany 2013 Conversation, Albany, NY

TEACHING @ FIU

Bioinformatics for Biologists

Undergraduate course

Spring 2014, Fall 2014, Fall 2015, Fall 2016

Advanced Bioinformatics for Biologists

Graduate course

Spring 2014, Fall 2014, Fall 2015

Personal Genomics and Molecular Medicine

Undergraduate course

Spring 2016

OTHER PROFESSIONAL ACTIVITIES AND OUTREACH

Professional Service

Organizer of NCBI Human Genome workshop given by Peter Cooper, NCBI. Nov 2014. *On-site* for Biomolecular Sciences Institute, Florida International University, Miami, FL

Co-organizer of Comparative Genomics workshop, June 2014, Biological Sciences, Florida International University, Miami, FL

Organizer (and speaker) of Computational Molecular Dynamics mini-symposia, Jan 2014, Biomolecular Sciences Institute, Florida International University, Miami, FL

Ad-hoc reviewer for NSF, BMC Evolutionary Biology, Journal of Molecular Evolution, Molecular Biology and Evolution, Genome Biology and Evolution, Journal of Biomolecular Structure and Dynamics, PLoS One, Protein & Peptide Letters, Medical Sciences, PLoS Computational Biology.

Review panel participant NSF 2011.

Outreach activities

Implemented a workshop for teaching K-3 about DNA, biodiversity and evolution, 2011.

Participated in an outreach program targeted to high school students "Women in Science" in Wyoming, 2010.

Organized an outreach activity about the structural organization of water molecules in its different phases and anti-freeze proteins, 2013.

Project coordinator for >1000 K-5 students participating in DNA related activities in their science classroom, 2016.