

Nicholas Attila Kovacs

STRUCTURAL BIOINFORMATICIST & DATA SCIENTIST

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Education

Ph.D. Bioinformatics

GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, Georgia

Aug 2013 - Dec 2018 (expected)

B.S. Biochemistry and Molecular Biology/Biotechnology

MICHIGAN STATE UNIVERSITY

East Lansing, Michigan

Aug 2008 - May 2012

Scientific Skills

Programming	Python, Perl, Bash, SQL, R, Javascript, MATLAB
Structural Bioinformatics	PyMOL, PyRosetta, VMD
Computational Genomics	de Novo Genome Assembly, SAMtools, BCFtools, GATK, Kent Source Tree, JBrowse
Operating Systems	Ubuntu, RHEL, Windows, Amazon Web Services
Molecular Biology	Molecular Cloning, One-Hybrid and Two-Hybrid Screening, GUS Staining
Biochemistry	SDS-PAGE, Western Blot, Enzyme Kinetics, Protein Crystallization, FRET
Bioanalytical Chemistry	Circular Dichroism, NMR, TLC, IR, Fluorescence Spectroscopy
Lab Organisms	<i>E. coli</i> , <i>S. cerevisiae</i> , <i>A. thaliana</i> , <i>Nannochloropsis sp.</i> , <i>A. tumefaciens</i>

Publications

- (8) **Kovacs, N. A.**, Penev, P., Venapally, A., Petrov, A. S., Williams, L. D. "Ribosomal Proteins and the Tree of Life", Submitted
- (7) Bernier, C.R., Petrov, A. S., **Kovacs, N. A.**, Williams, L. D. "Translation: The Universal Structural Core of Life", Under Review
- (6) Gómez Ramos, L. M., Degtyareva, N. N., **Kovacs, N. A.**, Holguin, S. Y., Jiang, L., Petrov, A. S., Biesiada M., Hu, M. Y., Purzycka, K. J., Arya, D. P., Williams, L. D. "Eukaryotic Ribosomal Expansion Segments as Antimicrobial Targets", *Biochemistry* 56, pgs 5288-5299 (2017)
- (5) **Kovacs, N.A.**, Petrov, A.S., Lanier, K.A., and Williams, L.D. "Frozen in Time: The History of Proteins", *Mol. Biol. Evol.* 34, pgs 1252-1260 (2017)
- (4) Gómez Ramos, L.M., Smeekeens, J.M., **Kovacs, N.A.**, Bowman, J.C., Wartell, R.M., Wu, R., and Williams, L.D. "Yeast rRNA Expansion Segments: Folding and Function", *J. Mol. Biol.* 428, pgs 4048-4059 (2016)
- (3) Petrov, A.S., Gulen, B., Norris, A.M., **Kovacs, N.A.**, Bernier, C.R., Lanier, K.A., Fox, G.E., Harvey, S.C., Wartell, R.M., Hud, N.V., and Williams, L.D. "History of the Ribosome and the Origin of Translation", *Proc. Natl. Acad. Sci. U.S.A.* 112, pgs 15396-15401 (2015)
- (2) Petrov, A.S., Bernier, C.R., Hsiao, C., Norris, A.M., **Kovacs, N.A.**, Waterbury, C.C., Stepanov, V.G., Harvey, S.C., Fox, G.E., Wartell, R.M., Hud, N.V., and Williams, L.D. "Evolution of the Ribosome at Atomic Resolution", *Proc. Natl. Acad. Sci. U.S.A.* 111, pgs 10251-10256 (2014)
- (1) Sharma, M., Predeus, A.V., **Kovacs, N.A.**, and Feig, M. "Differential Recognition Specificities of Eukaryotic MutS α and MutS β ", *Biophys. J.* 106, pgs 2483-2492 (2014)

Research Experience

Adviser: Dr. Loren Williams

GRADUATE RESEARCH ASSISTANT

Georgia Institute of Technology

Aug 2013 - Current

PhD Thesis: *The History of Proteins Revealed by Data Mining the Ribosome*

- **Hypothesis:** The ribosome is a molecular fossil; its structure can be mined to unravel the evolution of life
- **Tools:** Python, PyMOL, Adobe Illustrator, Perl, MATLAB, JavaScript
- **Funding:** NASA Astrobiology Institute
- **Support:** Data analysis for experimental labmates

Adviser: Dr. Chiaolong Hsiao

EAST ASIA AND PACIFIC SUMMER INSTITUTES FELLOW

National Taiwan University

Jun 2017 - Aug 2017

- **Project:** The Evolution of Proteins in Eukaryotes: Data Mining the Ribosome Structure
- **Tools:** Python, PyMOL
- **Funding:** National Science Foundation - East Asia and Pacific Summer Institutes

Adviser: Dr. Michael Feig

UNDERGRADUATE RESEARCH ASSOCIATE

Michigan State University

Dec 2012 - May 2012

- **Project:** Molecular simulations of Mismatch Repair Enzymes MutS α and MutS β

Adviser: Dr. Peter Westhoff

MOLECULAR BIOLOGY EXCHANGE STUDENT

- **Project:** DNA-protein interaction of cis-regulatory elements in *Flaveria sp.*

Heinrich-Heine Universität

May 2011 - Jul 2011

Adviser: Dr. Yair Shachar-Hill

UNDERGRADUATE RESEARCH ASSOCIATE

- **Project:** Metabolic flux analysis of carbon through *Nanochloropsis sp.*
- **Project:** Aquaporin signalling in *Arabidopsis thaliana* gametogenesis

Michigan State University

Jun 2010 - Mar 2011

Adviser: Dr. Cristoph Benning

UNDERGRADUATE RESEARCH ASSOCIATE

- **Project:** Protein-protein interactions in ER to chloroplast lipid trafficking

Michigan State University

Feb 2010 - May 2010

Awards and Scholarships

NSF East Asia and Pacific Institutes

EAPSI FELLOW

- **Project:** The Evolution of Proteins in Eukaryotes: Data Mining the Ribosome Structure
- **Adviser:** Dr. Chiaolong Hsiao
- **PI:** Nicholas Attila Kovacs
- Awarded \$5,400 stipend, \$1,667 living allowance, and roundtrip airfare to Taipei, Taiwan

National Taipei University

Mar 2017 - Mar 2018

Petit Undergraduate Research Scholars Program

GRADUATE MENTOR

- Research mentor for undergraduate student
- Awarded \$2,500 for materials and conference travel

Georgia Institute of Technology

Jan 2017 - Dec 2017

BASF Chemistry Symposium

3RD PLACE

- Oral presentation of PhD thesis research to Chemistry Department and science panel from BASF
- Awarded \$300

Georgia Institute of Technology

Apr 2017

Presentations

The Evolution of Proteins: Data Mining the Ribosome Structure

EARTH AND LIFE SCIENCE INSTITUTE 6TH INTERNATIONAL SYMPOSIUM · POSTER

Tokyo, Japan

Jan 2018

The History of Proteins

ASTROBIOLOGY GRADUATE STUDENT CONFERENCE · ORAL

Charlottesville, VA

Jun 2017

Eukaryotic Ribosomal Protein Evolution

BASF CHEMISTRY SYMPOSIUM · ORAL

Atlanta, GA

Apr 2017

Frozen in Time: The History of Proteins

SEARCH FOR LIFE: FROM EARLY EARTH TO EXOPLANETS · ORAL

Quy Nhon, Vietnam

Dec 2016

Frozen in Time: The History of Proteins

GEORGIA TECH CHEMISTRY RETREAT · ORAL

Atlanta, GA

Oct 2016

The History of Protein Folding

ASTROBIOLOGY GRADUATE STUDENT CONFERENCE · ORAL

Madison, WI

Jul 2015

The History of Protein Folding

ASTROBIOLOGY GRADUATE STUDENT CONFERENCE · POSTER

Troy, NY

Jul 2014

Teaching Experience

CHEM 6572 - Macromolecular Structure

GRADUATE TEACHING ASSISTANT – DR. LOREN WILLIAMS

Georgia Institute of Technology

2 Semesters

CHEM 4582 - Biochemistry Laboratory II

GRADUATE TEACHING ASSISTANT – DR. MARY PEEK

Georgia Institute of Technology

6 semesters

CHEM 3511 - Survey of Biochemistry

GRADUATE TEACHING ASSISTANT – DR. PAMELA PERALTA-YAHYA

Georgia Institute of Technology
1 semester