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Education

- **Ph.D. in Physics**—The Pennsylvania State University *2007*
- **B.S. in Engineering Physics**—University of Illinois at Urbana-Champaign *1997*

Professional Experience and Appointments

Systems Biology Team Leader 2012–present
University of Pittsburgh Drug Discovery Institute

Assistant Professor 2010–present
Department of Computational and Systems Biology
University of Pittsburgh

Postdoctoral Associate 2007–2010
Department of Computational and Systems Biology
University of Pittsburgh

Manufacturing Engineer 1997–1999
Merkle-Korff Industries

Refereed Publications

1. Lezon T, Banavar JR and Maritan A. *Recognition of coarse-grained protein tertiary structure*. Proteins 55, 536-547 (2004).
2. Lezon TR, Banavar JR, Lesk AM and Maritan A. *What determines the spectrum of protein native state structures?* Proteins 63, 273-277 (2006).
3. Banavar JR, Cieplak M, Flammini A, Hoang TX, Kamien RD, Lezon TR, Marenduzzo D, Maritan A, Seno F, Snir Y and Trovato A. *Geometry of proteins: hydrogen bonding, sterics and marginally compact tubes*. Phys. Rev. E. 73, 031921 (2006).
4. Lezon TR, Banavar JR and Maritan A. *The origami of life*. J. Phys. Cond. Matt. 18, 847-888 (2006).
5. Lezon TR, Banavar JR, Cieplak M, Maritan A and Fedoroff N. *Using entropy maximization to infer genetic interaction networks from gene expression patterns*. Proc. Natl. Acad. Sci. USA 103, 19033–19038 (2006).
6. Lezon TR, Sali A and Bahar I. *Global motions of the nuclear pore complex: insights from elastic network models*. PLoS Comp. Biol. 5:e1000496 (2009).

7. Bahar I, Lezon TR, Yang L-W and Eyal E. *Global dynamics of proteins: Bridging between structure and function.* Ann. Rev. Biophys. 39:23–32 (2010).
8. Bahar I, Lezon TR, Bakan A and Shrivastava IH. *Normal mode analysis of biomolecular structures: functional mechanisms of membrane proteins.* Chem. Rev. 110:1463–1497 (2010).
9. Lezon TR and Bahar I. *Using entropy maximization to understand the determinants of structural dynamics beyond native contact topology.* PLoS Comp. Biol. 6:e1000816 (2010).
10. Lezon TR. *The effects of rigid motions on elastic network model force constants.* Proteins 80:1133–1142 (2012).
11. Lezon TR and Bahar I. *Constraints imposed by the membrane selectively guide the alternating access dynamics of the glutamate transporter Glt_{Ph}.* Biophys. J. 102:1331–1340 (2012).
12. Bakan A, Dutta A, Mao W, Liu Y, Chennubhotla C, Lezon TR and Bahar I. *Evol and ProDy for bridging protein sequence evolution and structural dynamics.* Bioinformatics (2014). doi: 10.1093/bioinformatics/btu336
13. Gough A, Chen N, Schurdak M, Shun TY, Lezon T, Boltz R, Reese C, Wagner J, Vernetti L, Grandis J, Lee A and Taylor DL. *Identifying and Quantifying Heterogeneity in High Content Analysis: Application of Heterogeneity Indices to Drug Discovery.* PLoS One 9:e102678 (2014).

Book Chapters

1. Lezon TR, Banavar JR, Cieplak M, Fedoroff N and Maritan A. *The most probable genetic interaction networks inferred from gene expression patterns*, in *Analysis of Microarray Data: A Network-Based Approach.* Edited by Dehmer M and Emmert-Streib F. Wiley, 2008.
2. Lezon TR, Shrivastava IH, Yang Z and Bahar I. *Elastic network models for biomolecular dynamics: Theory and application to membrane proteins and viruses*, in *Handbook on Biological Networks.* Edited by Boccaletti S, Latora V and Moreno Y. World Scientific, 2009.
3. Zomot E, Bakan A, Shrivastava IH, DeChancie J, Lezon TR and Bahar I. *Sodium-coupled secondary transporters: insights from structure-based computations*, in *Molecular Machines.* Edited by Roux B. World Scientific, 2011.
4. Gough A, Lezon T, Faeder JR, Chennubhotla C, Murphy RF, Critchley-Thorne R and Taylor DL. *High content analysis with cellular and tissue systems biology*, in *The Molecular Basis of Cancer*, 4^{th} Edition. Edited by Mendelsohn J, Howley PM, Israel MA, Gray JW and Thompson CB. Elsevier, 2014.

Invited Seminars and Workshops

1. *A framework for globular proteins.* American Physical Society March Meeting, Baltimore, March 2006.
2. *Bridging the gap between structure and dynamics with elastic network models.* 66^{th} Annual Pittsburgh Diffraction Conference, Pittsburgh, October 2008.
3. *Content beyond expression: Exploiting phenotypic diversity in drug discovery.* Science 2011, University of Pittsburgh.

4. *Protein global dynamics explored through elastic network models.* Workshop on Computer Simulations of Biomolecular Dynamics and Reactions, Pittsburgh Supercomputing Center, June 2012.
5. *Elastic network models and collective motions of biomolecular systems using ProDy.* Workshop on Computational Biophysics, Pittsburgh, May 2013.
6. *Introduction to ProDy and its applications.* Workshop on Computational Biophysics, Pittsburgh, May 2014.
7. *ProDy: Overview and applications.* Workshop on Computational Biophysics, Pittsburgh Supercomputing Center, June 2015.

Contributed Talks and Posters

1. *Asymmetric scoring functions for proteins.* American Physical Society March Meeting, Austin, 2003.
2. *Using the principle of entropy maximization to infer genetic interaction networks from gene expression patterns.* First Annual Systems Biology Workshop, Pennsylvania State University, State College PA, September 2006.
3. *Reality's a drag: accounting for friction in simple protein models.* Biophysical Society 53^{rd} Annual Meeting, Boston, 2008.
4. *Generalized rules for the optimization of elastic network models.* American Physical Society March Meeting, Pittsburgh, 2009.
5. *Rules for selecting optimal elastic network model force constants.* VIII European Symposium of the Protein Society, Zurich, 2009.
6. *Frustration in protein elastic network models.* American Physical Society March Meeting, Portland OR, 2010.
7. *Specificity in protein conformational ensembles.* International Conference on Biological Physics, San Diego, 2011.
8. *Understanding heterogeneity of cellular responses in tumors by computational and systems biology.* American Society for Cell Biology Annual Meeting, San Francisco, 2012.
9. *Function theoretical analysis of high content data.* Great Lakes Bioinformatics Conference, Pittsburgh, 2013.

Courses Taught

CMPBIO2030	*Introduction to Computational Structural Biology* (Co-teach graduate-level course with 2 other instructors)	
	6 Lectures, 25 students	2012
	6 Lectures, 10 students	2013
	6 Lectures, 14 students	2014
	7 Lectures, 16 students	2015
CMPBIO2060	*Current Topics in Computational Biology*	2015

Research Mentoring

Cemal Erdem	Graduate Student (Co-mentored with Lans Taylor)	2013–present
Shana Bergman	Undergraduate Student (TECBio REU)	2015
Ariel Gewirtz	Undergraduate Student (TECBio REU)	2013
Nicholas Giangreco	Undergraduate Student (TECBio REU)	2012
Andrew King	Undergraduate Student, Bioinformatics	2012–2013
Anika Roy	High School Student (UPCI International Academy)	2015
Ashok Biju	High School Student (UPCI International Academy)	2013
Mukadasi Taxifulati	High School Student (UPCI Summer Academy)	2012
Aung Myo Naing	High School Student (UPCI Summer Academy)	2011

Other Teaching Activities

Instructor Hands-on Workshop on Computational Biophysics, Pittsburgh Supercomputing Center, 2013–2015

Guest Lecturer

IDM2014 *Functional genomics of infectious disease*, 2012, 2014
(Delivered 1 lecture on protein structure to graduate-level course)

MSMPHL2370 *Drug Discovery*, 2014
(Delivered 1 lecture on quantitative systems pharmacology)

Co-Director Drug Discovery, Systems & Computational Biology (DiSCoBio) International Academy, 2013–2015

Professional Activities

- Member, American Physical Society, 2001–2010
- Member, Biophysical Society, 2009–2016
- Member, American Society for Cell Biology, 2012–2013
- Referee for numerous scientific journals, including Physical Review Letters, PNAS, Scientific Reports, Biophysical Journal, Chemical Physics Letters, BMC Biophysics, Bioinformatics, Journal of Structural Biology, Proteins, PLoS Computational Biology, PLoS One, Journal of Molecular Graphics and Modeling
- Named "Outstanding Reviewer" by Elsevier, 2015

Awards and Honors

- NSF IGERT Fellow, 2001–2005
- NIH BIO-OCE Mentor-student travel award (With Shana Bergman, TECBio REU student), 2015

Research Support

Current

- NIH 5 UL1 TR000005-10, "University of Pittsburgh Clinical and Translational Science Institute" (Reis, PI) . 09/30/2006–06/30/2016. Role: Co-I. 3.6 Cal.
- UPMC Center for Commercial Applications Grant, "Computational pathology for accurate diagnosis of cancer (COMPACD)". (Chennubhotla, PI). Role: Co-I. 3.0 Cal.

Pending

- NIH 1 U01 CA204826-01, "Informatics Tools for Tumor Heterogeneity in Multiplexed Fluorescence Images" (Chennubhotla, PI). Role: Co-I. 3.6 Cal.
- NIH R01, "Global structural dynamics of the HIV-1 capsid" Role: PI. 3.6 Cal.
- NIH U54, "Impact of spatial intra-tumor heterogeneity on cancer evolution and drug resistance". (Lee, Taylor & Lu, PI). Role: Co-I. 3.0 Cal.