

Curriculum Vitae

**Nurit
Haspel**

University of Massachusetts,
Boston
Dept. of Computer Science
100 Morrissey Blvd.
Boston, MA 02125

Tel: (713)-348-5710
Fax: (713)-348-5930
Email: nurit.haspel@umb.edu
<http://www.cs.umb.edu/~nurith>

EDUCATION

- Tel-Aviv University**, Tel-Aviv, Israel **2002-2006**
Ph.D., Structural Bioinformatics (Department of Computer Science)
Advisors: Prof. Haim Wolfson and Prof. Ruth Nussinov
Thesis title: Computational modeling and prediction of self assembling beta-sheet rich protein structures
- Tel-Aviv University**, Tel-Aviv, Israel **1999-2002**
M.Sc., Structural Bioinformatics (Department of Human Genetics),
Summa Cum Laude
Advisors: Prof. Ruth Nussinov and Prof. Haim Wolfson
Thesis title: Computational study of protein folding pathways using the building blocks folding model
- Tel-Aviv University**, Tel-Aviv, Israel **1995-1998**
B.Sc., Chemistry and Computer Science, Magna Cum Laude

ACADEMIC EMPLOYMENT

- University of Massachusetts Boston**, Department of Computer Science **2009-present**
Assistant Professor
- Rice University**, Houston, TX, Department of Computer Science **2007-2009**
Postdoctoral research associate, [Physical and Biological Computing Group](#)
Advisor: Prof. Lydia Kavradi
- Tel-Aviv University**, Tel-Aviv, Israel, School of Computer Science **2002-2006**
Research and teaching assistant, [Structural Bioinformatics Group](#).
Advisors: Prof. Haim Wolfson and Prof. Ruth Nussinov
- National Cancer Institute**, Frederick, MD **2001-2005**
Visiting researcher, [Center for Cancer Research Nanobiology Program](#)
Advisor: Prof. Ruth Nussinov

Tel-Aviv University, Tel-Aviv, Israel, Department of Human Genetics

1999-2002

Research assistant, [Structural Bioinformatics Group](#).

Advisors: Prof. Ruth Nussinov and Prof. Haim Wolfson

SELECTED AWARDS AND SCHOLARSHIPS

- **2009:** Postdoctoral Fellow of NIH Nanobiology Training program of the Gulf Coast Consortia (declined).
- **2004, 2006:** Tel Aviv University School of Computer Science PhD fellowship.
- **2005:** Don and Sara Marejn award for PhD students.
- **2005:** Dan David prize for PhD students.
- **2002, 2003:** Tel Aviv University Rector Scholarship for excellent PhD students.
- **1999-2001:** Tel Aviv University School of Medicine MSc Fellowship.
- **1997:** Tel Aviv University commemoration fellowship.
- **1997:** Undergraduate training scholarship, School of Chemistry, Tel Aviv University
- **1996, 1997:** Dean's honor list, School of Chemistry, Tel Aviv University.

PUBLICATIONS

PEER REVIEWED JOURNAL ARTICLES

1. **Haspel N.**, Zanut D., Nussinov R., Teesalu T., Ruoslahti E. and Aleman C. Binding of a C-end rule peptide to neuropilin-1 receptor: A molecular modeling approach. *Biochemistry* 50(10):1755-1762, 2011.
2. **Haspel N.**, Moll M., Baker M., Chiu W. and Kavraki L.E. Tracing conformational changes in proteins. *BMC Structural Biology*, 10 Suppl.1 (S1) (2010).
3. **Haspel N.**, Geisbrecht B., Lambris J. and Kavraki L.E. Multi-scale Characterization of the Energy Landscape of Proteins with Application to the C3d/Efb-C Complex. *Proteins: Structure, Function and Bioinformatics*, 78(4):1004-1014 (2010).
4. Zanut D., Ballano G., Jimenez A., Casanovas J., **Haspel N.**, Cativiela C., Curcó D., Nussinov R., Aleman C., Protein segments with conformationally restricted amino acids can control supramolecular organization at the nanoscale. *Journal of Chemical Information and Modeling*, 49(7): 1623-1629 (2009). (selected for journal cover).
5. **Haspel N.***, Ricklin D.*, Geisbrecht B., Kavraki L.E. and Lambris J.D., Electrostatic Contributions Drive the Interaction Between Staphylococcus aureus Protein Efb-C and its Complement Target C3d. *Protein Science*, 17(11):1894-1906 (2008).
* These authors contributed equally to the work
6. **Haspel N.**, Zanut D., Zheng J., Alemán C., Wolfson H. and Nussinov R. Changing the charge distribution of beta-helical based nanostructures can provide the conditions for charge transfer. *Biophysical Journal*, 93:245-253 (2007).

7. Zheng J., Zanuy D., **Haspel N.**, Tsai C.J., Alemàn C. and Nussinov R. Nanostructure Design using Protein Building Blocks Enhanced by Conformationally Constrained Synthetic Residues. *Biochemistry*, 46(5):1205-1218 (2007).
8. Tsai C.J., Zheng J., Zanuy D., **Haspel N.**, Wolfson H., Alemàn C. and Nussinov R. Principles of nanostructure design with protein building blocks. *Proteins: Structure, Function and Bioinformatics* 68(1):1-12 (2007).
9. Zanuy D., Rodriguez-Ropero F., **Haspel N.**, Zheng J., Nussinov R. and Alemàn C. Stability of tubular structures based on beta-helical proteins: self-assembled versus polymerized nanoconstructs and wild-type versus mutated sequences. *Biomacromolecules*, 8(10):3135-3146 (2007).
10. **Haspel N.**, Zanuy D., Alemàn C., Wolfson H. and Nussinov R. De-novo tubular nanostructure design based on self-assembly of β -helical protein motifs. *Structure*, 14(7):1137-1148 (2006).
11. Wainreb G., **Haspel N.**, Wolfson H. and Nussinov, R., A permissive secondary structure guided superposition tool for clustering of protein fragments toward protein structure prediction via fragment assembly. *Bioinformatics* 22: 1343 – 1352 (2006).
12. Aleman C., Zanuy D., Jimenez A.I., Cativiela C., **Haspel N.**, Zheng J., Casanovas J., Wolfson H. and Nussinov R.: Concepts and schemes for the re-engineering of physical protein modules: generating nanodevices via targeted replacements with constrained amino acids. *Physical biology*, 3(1):S54-S62 (2006).
13. **Haspel N.**, Zanuy D., Ma B., Wolfson H. and Nussinov R., A comparative study of amyloid fibril formation by residues 15-19 of the human calcitonin hormone: A single β -sheet model with a small hydrophobic core. *Journal of Molecular Biology* 345(5):1213-1227 (2005).
14. Zanuy D.*, **Haspel N.***, Ma B., Kannan G., Wolfson H. and Nussinov R. Side chain interactions determine the amyloid organization: a single layer β -sheet molecular structure of the calcitonin peptide segment 15–19. *Physical Biology*, 1:89-99 (2004).
* These authors contributed equally to the work.
15. Tsai H. H., Zanuy D., **Haspel N.**, Ma B., Gunasekaran K., Tsai C.J. and Nussinov R., The Stability and Dynamics of the Human Calcitonin Amyloid Peptide DFNKF. *Biophysical Journal*, 87(1),146-158 (2004).
16. **Haspel N.**, Tsai C.J. Wolfson H. and Nussinov R., Hierarchical protein folding pathways: A computational study of protein fragments. *Proteins: Structure, Function and Bioinformatics*, 51:203-215 (2003).
17. **Haspel N.**, Tsai C.J. Wolfson H. and Nussinov R., Reducing the computational complexity of protein folding via fragment folding and assembly. *Protein Science*, 12:1177-1187 (2003).
18. Schneidman-Duhovny D., Inbar Y., Polak V., Shatsky M., Halperin I., Benyamini H., Barzilay A., Dror O., **Haspel N.**, Nussinov R. and Wolfson H.J. Taking geometry to its edge: fast unbound rigid (and hinge-bent) docking. *Proteins, Structure, Function and Genetics*. 52(1): 107-112 (2003).

BOOK CHAPTERS

1. **Haspel N.**, Wainreb G., Inbar Y., Tsai H.H., Tsai C.J., Wolfson H.J. and Nussinov R., A hierarchical protein folding scheme based on the building block folding model. *Methods Mol. Biol.*, 350:189-204 (2007).
2. **Haspel N.**, Zanuy, D., Tsai H.H., Ma B., Wolfson H. and Nussinov R. Computational approaches and tools for establishing structural models for short amyloid-forming peptides. In *Amyloid Proteins*. Ed. Jean D. Sipe. Wiley-VCH, volume 1, pp 301-318 (2005).
3. **Haspel N.**, Tsai C. J., Wolfson H. and Nussinov R., From the building blocks folding model to protein structure prediction. In *Tsigelny I., (Ed): Protein Structure Prediction: Bioinformatics approach. International University Line*, chapter 8, 201-226 (2002).
4. Kumar S., Barzilai A., **Haspel N.**, Sham Y. Y., Tsai C. J., Wolfson H. and Nussinov R., Critical building blocks in proteins: a common theme in folding and binding. In *Gromiha, M. KH. and Selvarage, S. (Eds): Recent Research Developments in Protein Folding, Stability and Design*. Research Signpost, chapter 15. Trivadrur, India (2002).

PEER-REVIEWED CONFERENCES PROCEEDINGS

1. **N. Haspel** and E. Gonzalez. Topological properties of the configurational space of proteins. To appear in Proc. of the 4th International Conference on Bioinformatics and Computational Biology (BICoB), Las Vegas NV, Mar. 2012
2. B. Akbal, I. Hashmi, A. Shehu and **N. Haspel**. Refinement of protein complex structures using evolutionary traces. Proc. of the Computational Structural Biology Workshop (CSBW), in conjunction with IEEE BIBM '11, Atlanta GA, 400-405, Nov. 2011.
3. I. Hashmi, B. Akbal, **N. Haspel** and A. Shehu. Protein docking with information on evolutionary conserved interfaces. Proc. of the Computational Structural Biology Workshop (CSBW), in conjunction with IEEE BIBM '11, Atlanta GA, 358-365, Nov. 2011.
4. **Haspel, N.** Computing Structural changes in proteins represented at a coarse level. in *Proceedings of Bionetics10*, Dec. 2010, Boston MA.
5. **Haspel N.**, Moll M., Baker, M.L., Chiu W. and Kaviraki L.E. Tracing Conformational Changes in Proteins. *Proceedings of CSBW09* (Computational Structural Biology Workshop), 120-127, part of BIBM09 – IEEE international conference on Bioinformatics and Biomedicine, Nov. 2009, Washington DC.

SELECTED PRESENTATIONS

1. Conquering the Complexity of Protein Data, Bio-IT conference, Lehigh University, and Bio-IT 2011 (April 2011).
2. Haspel, N. (Presenter) Oral Presentation, Affordable departmental supercomputing to calculate protein dynamics, Bio-IT 2011, (April 2011).
3. Computing Structural Changes in Proteins, UMass Boston, Biology department seminar, Sep. 2009 (invited talk), George Mason University, CS department seminar, Nov. 2009 (invited talk).
4. **Haspel N.**, Moll M. and Kaviraki L.E., HPC for Computational Structural Biology. Rice University annual HPC users workshop, 2008 (invited talk).

5. “Design of Novel Nano-structures using beta-helical protein segments”. University of Illinois at Urbana-Champaign, 2006 (seminar talk).
6. “A comparative study of the amyloid structures formed by the hCT peptide”. Ben-Gurion University, Beer-Sheva, Israel, 2004 (invited seminar talk).
7. “Computational study of protein folding pathways using the building blocks folding model”. National Cancer Institute, Frederick, MD, 2000 (invited seminar talk).

FUNDING AND RESOURCES

- AF: SMALL: Developing Novel Computational Methods for Investigating Protein Dynamics Using a Multi-Scale Approach, **Haspel N.** (PI), \$249,774, (September 1, 2011 - August 31, 2014).
- UMass Boston proposal development grant: Towards Rational Design of Amyloid-based Peptides to Self-assemble into Ordered Nano- or Micro-structures with Distinct Morphology. **Haspel N.** (PI), Zheng J., U. of Akron (Co-PI), April 2010 – December 2011 - \$10000.
- UMass Boston Healey Research grant: Identification and Characterization of Biologically Active Metabolic Fragments of Pituitary Hormones: Has an Entire Area of Cell Signaling Been Missed? Campbell K. (Co-PI), **Haspel N.** (Co-PI). April 2010 – June 2011, \$12000.
- PII award for instruction innovation: WUMP – women undergraduate mentoring program. Ding W. (PI), Haspel N.(Co-PI), O'Neil E. (Co-PI), Jan. 2010 - \$5000.

TEACHING

- **2010:** CS624, Analysis of Algorithms, UMass Boston.
- **2009-2011:** CS310, Advanced data structures and algorithms, UMass Boston.
- **2008:** Teaching assistant, COMP 450, Algorithmic Robotics, Rice University.
- **2006:** Lecturer, Programming for engineering students, Tel Aviv University.
- **2005,2006:** Teaching assistant, Introduction to Computer Science in Scheme, Tel Aviv University.
- **2003,2004:** Teaching assistant, Programming for engineering students, Tel Aviv University.
- **2005:** Lecturer, Programming for Chemistry students, Tel Aviv University.

MENTORED STUDENTS

- Kit Menlove (graduate student rotation project), Rice University. Advisor – Lydia Kavraki.
- Nick Zhu (undergraduate research project), Rice University. Advisor – Lydia Kavraki.
- Bahar Akbal (PhD student), UMass Boston.
- Rohith Kotla (PhD student), UMass Boston.
- Uma Vadhar (Msc Student). co-advisor. Main advisor – Kenneth Campbell, UMass Boston, department of Biology.

- Alex Jurgens – Undergraduate research project.
- Harold Gomez – Undergraduate honors thesis.

PROFESSIONAL DEVELOPMENT

CONFERENCE ORGANIZATION

- Computational Structural Biology Workshop (CSBW) 2011, co-chair.
- Bionetics 2010, special track on bioinformatics, chair.
- Bionetics 2010, special track on visualization, PC member.
- International Conference on Recent Advances in Technology, Engineering, Management and Science (ICRATEMS-2011) – advisory committee.

REVIEWER

- Proceedings of the National Academy of Science (PNAS).
- Computational Systems in Bioinformatics conference (CSB).
- RECOMB conference.
- Biopolymers: Peptide science.
- Journal of Bioinformatics and Computational Biology – special guest editor for the Bioinformatics track in BIONETICS 2010.
- IEEE/ACM transactions on Computational Biology and Bioinformatics.
- Journal of Organic Chemistry.
- PLoS Computational Biology.
- PLoS one.
- International Journal of Data Mining and Bioinformatics (IJDMB).
- Editorial board member of the book "Developing and Applying Biologically-Inspired Vision Systems: Interdisciplinary Concepts" to be published by IGI Global. Editors: Marc Pomplun and Jun Suzuki.
- Guest editor for a special issue in JBCB, June 2011 (associated with Bionetics).

MEMBER

- International Society for Computational Biology (ISCB).
- Association for Computing Machinery (ACM).
- Protein Society.
- Biophysical Society.
- IEEE, IEEE Women in Engineering.