Biography and Publications

Daniel J. Needleman Ph.D.
Assistant Professor of Applied Physics and
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Biography

<Employment>

1997	Laboratory Assistant Brandeis University, Waltham, MA Volen Center for Complex Systems, Advisor: Laurence F. Abbott
1998-1999	Research Assistant Salk Institute for Biological Studies, San Diego, CA Computational Neurobiology Laboratory, Advisor: Terrence J. Sejnowski
2005-2008	Postdoctoral Fellow Harvard University, Boston, MA Advisor: Timothy J. Mitchison
2008-	Assistant Professor of Applied Physics and Assistant Professor of Molecular and Cellular Biology Harvard University, Boston, MA

<Education>

1994-1998	Brandeis University, Waltham, MA BA, High Honors, Summa Cum Laude Major: Physics, Minors: Chemistry, Economics Thesis Advisor: Seth Fraden
1999-2005	University of California at Santa Barbara, Santa Barbara, CA Department of Physics, PhD Thesis Advisor: Cyrus Safinya
April 2003	Cold Spring Harbor Laboratory, Cold Spring Harbor, NY Protein Purification and Characterization
June-July 2004	Marine Biology Laboratory, Woods Hole, MA Physiology: Modern Cell Biology Using Microscopic, Biochemical and Computational Approaches

Publications

1）	**Daniel J. Needleman**, Aaron Groen, Ryoma Ohi, Leonid Mirny, Tim Mitchison, *Fast Microtubule Dynamics in Meiotic Spindles Measured by Single Molecule Imaging: Evidence that the Spindle Environment does not Stabilize Microtubules*. Molecular Biology of the Cell, 2010, **21**, 323-333.
2)	**Daniel Needleman**, *Cellular Allometry: The Spindle in Development and Inheritance*. Current Biology, 2009, **19**, R846-R847.
3)	Alexander F. Schier and **Daniel Needleman**, *Rise of the Source-Sink Model*. Nature, 2009, **2461**, 480-481.
4)	M.C. Choi, U. Raviv, H.P. Miller, M.R. Gaylord, E. Kiris, D. Ventimiglia, **D.J. Needleman**, M.W. Kim, L. Wilson, S.C. Feinstein, C.R. Safinya, *Human Microtubule-Associated-Protein Tau Regulates the Number of Protofilaments in Microtubules: A Synchrotron X-Ray Scattering Study* Biophysical Journal, 2009, **97**, 519-527
5)	Martin Wuhr, Sophie Dumont, Aaron C. Groen, **Daniel J. Needleman**, Tim Mitchison, *How Does A Millimeter-Sized Cell Find Its Center?* Cell Cycle, 2009, **8**, 1115-1121
6)	**Daniel J. Needleman**, Yangqing Xu, Tim Mitchison, *Pin-Hole Array Correlation Imaging: Highly Parallel Fluorescence Correlation Spectroscopy*. Biophysical Journal, 2009, **96**, 5050-5059
7)	Jesse C. Gatlin, Alexandre Matov, Aaron C. Groen, **Daniel J. Needleman**, Thomas J. Maresca, Gaudenz Danuser, Tim Mitchison, E.D. Salmon, *Spindle Fusion Requires Dynein-Mediated Sliding of Oppositely Oriented Microtubules.* Current Biology, 2009, **19**, 287-296
8)	Martin Wuehr, Yao Chen, Sophie Dumont, Aaron Groen, **Daniel J. Needleman**, Adrian Salic, Timothy J. Mitchison, *Evidence for an Upper Limit to Mitotic Spindle Length*. Current Biology, 2008, **18**, 1256-1261
9)	Aaron C. Groen, **Daniel J. Needleman**, Clifford Brangwynne, Christain Gradinaru, Brandon Fowler, Ralph Mazitschek, Timoth J. Mitchison, *A Novel Small-Molecule Inhibitor Reveals a Possible Role of Kinesin-5 in Anastral Spindle-Pole Assembly.* Journal of Cell Science, 2008, **121**, 2293-2300
10)	**Daniel J. Needleman, *Plasmid Segregation: Is a Total Understanding within Reach?* Current Biology, 2008, 18, R212-R214**
11)	Uri Raviv, **Daniel J, Needleman**, Kai Ewert, Cyrus R. Safinya, *Hierarchical Bionanotubes Formed by the Self Assembly of Microtubules with Cationic Membranes or Polypeptides.* Journal of Applied Crystallography. 2007, **40**, s83-s87.
12)	Uri Raviv, Toan Nguyen, Rouzbeh Ghafouri, **Daniel J, Needleman**, Youli Li, Herbert P. Miller, Leslie Wilson, Robijn F. Bruinsma, Cyrus R. Safinya, *Microtubule Protofilament Number is Modulated in a Step-Wise Fashion by the Charge Density of an Enveloping Layer.* Biophysical Journal. 2007, **92**, 278-287.
13)	Cyrus R. Safinya, Kai Ewert, Ayesha Ahmad, Heather M. Evans, Uri Raviv, **Daniel J. Needleman**, Alison J. Lin, Nele L. Slack, Cyril George. *Cationic Liposome-DNA Complexes: From Liquid Crystal Science to Gene Delivery Applications.* Philosophical Transactions of the Royal Society A, 2006, **364**, 2573-2596.

14)	Uri Raviv, **Daniel J. Needleman**, Cyrus R. Safinya, *Cationic Membranes Complexed with Oppositely Charged Microtubules: Hierarchical Self-Assembly Leading to Bio-Nanotubes*. Journal of Physics: Condensed Matter, 2006, **18**, S1271-S1279.
15)	**Daniel J. Needleman**, Jayna B. Jones, Uri Raviv, Miguel A. Ojeda-Lopez, Herbert P. Miller, Youli Li, Leslie Wilson, Cyrus R. Safinya, *Supramolecular Assembly of Biological Molecules Purified from Bovine Nerve Cells: from Microtubule Bundles and Necklaces to Neurofilament Networks.* Journal of Physics: Condensed Matter, 2005, **17**, S3225-S3230.
16)	**Daniel J. Needleman**, Miguel Ojeda-Lopez, Uri Raviv, Kai Ewert, Herbert P. Miller, Leslie Wilson, Cyrus R. Safinya, *Radial Compression of Microtubules and the Mechanism of Action of Taxol and Associated Proteins.* Biophysical Journal, 2005, **89**, 3410-3423.
17)	Uri Raviv, **Daniel J. Needleman**, Miguel Ojeda-Lopez, Herbert P. Miller, Leslie Wilson, Cyrus R. Safinya, *Cationic Liposome-Microtubule Complexes: Pathway s to the Formation of Two-State Lipid-Protein Nanotubes with Open or Closed Ends.* Proceedings of the National Academy of Sciences, Track II, August 2005, **102**, 11167-11172
18)	**Daniel J. Needleman**, Miguel Ojeda-Lopez, Uri Raviv, Herbert P. Miller, Leslie Wilson, Cyrus R. Safinya, *Higher Order Assembly of Microtubules by Counter-ions: From Hexagonal Bundles to Living Necklaces.* Proceedings of the National Academy of Sciences, Track II, November 2004, **101**, 16099-16103 Featured as “from the cover” and selected as a Stanford Synchrotron Research Laboratory science highlight(see http://www-ssrl.slac.stanford.edu/research/highlights_archive/index.html).Reprinted in Virtual Journal of Biological Physics, December 1, 2004, 8 (11).
19)	**Daniel J. Needleman**, Miguel Ojeda-Lopez, Uri Raviv, Kai Ewert, Jayna B. Jones, Herbert P. Miller, Leslie Wilson, Cyrus R. Safinya, *Microtubule Buckling and Bundling Under Osmotic Stress: A Synchrotron X-ray Diffraction Study Probing Inter-Protofilament Interactions.* Physical Review Letters, November 2004, **93**, 198104 Reprinted in Virtual Journal of Biological Physics, November 15, 2004, 8 (10).
20)	Deborah K. Fygenson, **Daniel J. Needleman**, Kim Sneppen, *Variability Based Sequence Alignment Identifies Residues Responsible for Functional Differences in a and b Tubulin.* Protein Science, January 2004, **13**, 25-31
21)	**Daniel J. Needleman, Paul Tiesinga, Terrence J. Sejnowski, *Collective Enhancement of Precision in Networks of Coupled Oscillators.* Physica D, July 2001, 155, 324-336**
22)	**Stephen Monks, Daniel J. Needleman, Christopher Miller, *Helical Structure and Packing Orientation of the S2 Segment in the Shaker K+ Channel.* Journal of General Physiology, March 1999, 113, 415-423**

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