Stephen J. DeCamp, PhD

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SUMMARY

An independent and creative research associate with strong scientific communication skills and over 13 years of research experience in academic research labs. Primary focus is with interfacing materials science, soft-matter physics, and cell biology. Core competency of balancing high-level research strategy simultaneously with in-the-weeds details. As an experimentalist, I approach research problems with an open mind for creative solutions, a collaborative, team-oriented attitude, and a sense of humor.

EDUCATION & TRAINING

Harvard School of Public Health, Research Associate September 2019 – Present
Postdoctoral Research Fellow September 2016 – August 2019
Molecular and Integrative Physical Sciences Program
Supervisor: Dr. Jeffrey Fredberg

Brandeis University, PhD. in Physics September 2010 – August 2016
Concentration in quantitative biology
Supervisor: Dr. Zvonimir Dogic
Dissertation Title: *Dynamics of Active Nematic Liquid Crystals*

Michigan State University, B.S. in Physics and Astrophysics August 2006 – May 2010
Supervisor: Dr. Lisa Lapidus
Thesis Title: *Circular Dichroism Measurements in a Microfluidic Serpentine Mixer*

RESEARCH EXPERIENCE

Harvard T.H. Chan School of Public Health **Boston, MA**
Research Associate **September 2019 – Present**
Postdoctoral Research Fellow **September 2016 – August 2019**

- Initiated and lead original research project; managed a multi-disciplinary research team.
- Championed a proof-of-concept analysis pipeline for biomechanics and cancer pathology research.
- Generated a cell line with transfected fluorescence-based biosensors that report cell metabolism.
- Coded image analysis algorithms to quantify cell metabolic properties from microscopy images.
- Simultaneously measured cell mechanics, dynamics, and metabolic properties of single cells.
- Discovered a spatial gradient in the cell metabolic state during epithelial cell layer migration.

Brandeis University **Waltham, MA**
Graduate Research Associate **September 2010 – August 2016**

- This research resulted in numerous *Science* and *Nature* publications.
- Created custom image analysis algorithms to quantify the dynamics of active nematic liquid crystals.
- Generated protocols for stable and reproducible microtubule polymerizations and protein purifications resulting in gram-quantities of tubulin.
- Invented an experimental technique for generating large, flat, 2D oil-water interfaces.
- Performed sample prep, polarization-light microscopy, and fluorescence-light microscopy.
- Designed and fabricated custom micro-fluidics using CAD software and soft-lithography cleanroom processes, resulting in rapid-prototyping of PDMS devices.

Michigan State University, Department of Physics and Astronomy **East Lansing, MI**
Undergraduate Research **August 2006 – May 2010**

- Developed novel and custom optical microscopy instrumentation.
- Measured circular dichroism spectra during protein folding with time resolution.
- Utilized advanced microfluidics to initiate protein folding via ultra-rapid dilution of denaturant.
- Employed hard-contact photolithography, polysilicon deposition, and high-aspect ratio silicon wafer etching with D-RIE methods for micro-fluidic fabrication.
- Programmed control interfaces for custom microscopy instrumentation using LabView software.

PUBLICATIONS

L. Atia, D. Bi, Y. Sharma, J.A. Mitchel, B. Gweon, S. Koehler, **S. J. DeCamp**, B. Lan, J. Kim, R. Hirsch, A.F. Pegoraro, K. Lee, J. Star, D. A. Weitz, A. C. Martin, J. Park, J.P. Butler, J.J. Fredberg. "Geometrical constraints during epithelial jamming." *Nature Physics*, 14:613-20, 2018. 2018

Y. Sharma, L. Atia, C.S. Rhodes, **S. J. DeCamp**, J. Mitchel, J.J. Fredberg. "Scaling physiologic function from cell to tissue in asthma, cancer, and development." *Annals ATS*, Nov 2017 15(1). 2017

K. Wu, B. Hishamunda, D.T.N. Chen, **S. J. DeCamp**, Y. Chang, A. Fernández-Nieves, S. Fraden, Z. Dogic. "Transition from turbulent to coherent flows in confined three-dimensional active fluids." *Science*, Mar 2017. 365(6331). 2016

S. J. DeCamp*, G. S. Redner*, A. Baskaran, M. F. Hagan, Z. Dogic. "Orientational order of motile defects in active nematics." *Nature Materials,* Aug 2015; 14, 1110-1115 2015

G. Henkin*, **S. J. DeCamp***, DT. Chen*, T. Sanchez, Z. Dogic. "Tunable dynamics of microtubule-based active isotropic gels." *Phil. Trans. R. Soc. A*. Nov 2014; 372(2029). 2014

F. C. Keber*, E. Loiseau*, T. Sanchez*, **S. J. DeCamp**, L. Giomi, M. J. Bowick, M. C. Marchetti, Z. Dogic, A. R. Bausch. "Topology and dynamics of active nematic vesicles." *Science*, Sept 2014; 345(6201), 1135-1139. 2014

L.J. Lapidus, S. Acharya, C. Schwantes, L. Wu, D. Shukla, M. King, **S.J. DeCamp**, V.S. Pande. "Complex pathways in folding of protein G explored by simulation and experiment." *Biophysical Journal*, Aug 2014; 4 (107): 947-955. 2014

T. Sanchez*, DT. Chen*, **S. J. DeCamp***, M. Heymann, Z. Dogic. "Spontaneous Motion in Hierarchically Assembled Active Matter." *Nature*, Nov 2012; 491(424): 431-4. 2012

S. J. DeCamp, A. Naganathan, S. Waldauer, O. Bakajin, L. Lapidus. "Direct Observation of Downhill Folding of λ-Repressor in a Microfluidic Mixer." *Biophysical Journal*, Sep 2009; 6 (97): 1772-1777. 2009

S. Waldauer, O. Bakajin, T. Ball, Y. Chen, **S. J. DeCamp**, M. Kopka, V. Singh, W. Wedemeyer, S. Weiss, S. Yao, and L. Lapidus. "Ruggedness in the Folding Landscape of Protein L." *HFSP Journal*, Dec 2008; 2 (6): 388-395. 2008

* *indicates co-first authorship.*

GRANTS, AWARDS, & HONORS

K25 Grant for Mentored Quantitative Research Development Award Submitted 2019
National Heart, Lung, Blood Institute, National Institutes of Health

Early Career Meeting Grant Recipient for BostonSoftMatter.com, Founder and Co-Organizer 2017
American Society for Cell Biology (ASCB)

NHLBI T32 Training Grant in the Molecular and Integrative Physical Science Program 2016-2019
Harvard T.H.Chan School of Public Health

Dr. Stephan Berko Prize, 23rd Berko Symposium 2014
Brandeis University, Waltham, MA

Andor/Bitplane Insight Award for best microscopy image 2013
Brandeis University, Waltham, MA

NIBIB Quantitative Biology Training Grantee in Quantitative Biology 2011-2012
Brandeis University, Waltham, MA

TEACHING & SUPERVISION

Lehman Foundation Research Mentor 2018-2019
Supervised 2 undergraduate research projects and mentored career development activities

Harvard University Science Education Undergraduate Mentoring Workshop Series 2018
Received certificate in undergraduate research mentorship

HHMI Quantitative Biology Research Community Mentor 2015
Mentored 6 students in a laboratory-based experiential learning program

Active Sample Bootcamps for the Brandeis NSF MRSEC 2012-2015
Trained dozens of external researchers in active sample preparation

Undergraduate Research Mentor in the Dogic Lab at Brandeis University 2012-2015
Supervised 3 undergraduates resulting in 1 publication

Teaching Assistant for Introduction to Physics Lab at Brandeis University 2010-2011
Instructed a physics lab for pre-med students