

Stephen J. DeCamp, PhD

Somerville, MA

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SUMMARY

- Innovative, cross-functional, and interdisciplinary scientist with strong communication skills.
 - Track record of rapidly adapting to new fields and generating high impact advances.
 - Interface of physics, biology, and materials science.
 - Balances high-level strategy with in-the-weeds details.
 - Open mind for creative solutions and a team building attitude.
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RESEARCH & WORK EXPERIENCE

Ohana Biosciences, Inc. (*Ohana ceased operations due to failure to secure funding*) **Cambridge, MA**
Surface Chemistry and Microfluidic Scientist II **March 2021 – April 2021**

- Developed microfluidic technology for sperm cell selection and separation for clinical applications of assisted reproductive technologies (ART) impacting fertility and offspring health.
- Initiated R&D projects for ligand-based surface functionalization for cell selection.
- Prioritized research strategy goals and produced timeline and resource requirements for next generation microfluidic technology.
- Co-lead Diversity and Inclusion initiatives for Ohana including STEM outreach opportunities.
- Engaged in outlining breakthrough advances in sperm cell biology for applications in IVF and IUI.

Harvard T.H. Chan School of Public Health **Boston, MA**
Research Associate **September 2019 – February 2021**
Postdoctoral Research Fellow **September 2016 – August 2019**

- Initiated and led a project interfacing materials science, physics, and biology.
- Rapidly learned techniques in epithelial cell biology to achieve project goals.
- Assembled and led a multi-disciplinary team.
- Developed assays for cell metabolism and tissue mechanics studies.
- Leveraged microscopy, materials engineering, biomarkers, and Matlab-based analysis.
- Coded custom data analysis and image analysis pipelines for biophysical applications.
- Founded and led a Boston-based meetup group (Boston Soft Matter Socials) that fostered synergy between researchers with diverse backgrounds ranging from physics, math, engineering, and biology.
- Principal investigator on multiple projects and grants.

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

- Pioneered advances in bioengineered materials resulting in dozens of high-impact publications.
- Implemented custom instrumentation and hardware for optics, rheology, and 3D bioprinting.
- Fabricated novel microfluidics for high-impact biomaterials science experiments.
- Innovated assays and analytical protocols now used ubiquitously throughout the field.
- Coded algorithms for statistical analysis, micro-rheology, and object tracking.
- Instructed experts and non-experts on proper experimental and analysis procedures.
- Supervised numerous undergraduate research projects.

Michigan State University
Undergraduate Research Assistant

East Lansing, MI
August 2006 – May 2010

- Integrated instrumentation and methods from physics and molecular biology.
- Conducted experiments in real-time protein folding studies.
- Built and maintained laser confocal microscopes.
- Coded instrument controls using LabView software.
- Fabricated silica-based microfluidics using cleanroom techniques such as hard-contact photolithography, polysilicon deposition, and high-aspect ratio silicon wafer etching with D-RIE methods for microfluidic fabrication.

EDUCATION & TRAINING

Harvard School of Public Health, Postdoctoral Fellow (Trainee) September 2016 – August 2019
Molecular and Integrative Physical Sciences Program
Supervisor: Dr. Jeffrey J. Fredberg

Brandeis University, PhD. in Physics September 2010 – August 2016
Attachment: 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*

SKILLS

Wetlab Biology: Experience in assay development for cell energy metabolism studies. Glycolysis and mitochondria characterization. Fluorescence biosensors. FACS flow cytometry. Transfection. Sample fixation. Protein purification. HPLC. Plasmid DNA work. Epithelial cell culture and tissue bioengineering. Human semen and sperm cell processing. Density gradient centrifugation. Cell staining.

Optics/Microscopy: Experience in multiple modes of microscopy including: fluorescence, laser confocal, phase, CD spectroscopy, TIRF, and polarization light microscopy. – Experience in designing and building optical systems for applications in bio-materials imaging and subsequent image analysis.

Computational: Skilled in image analysis for fluorescence quantification, cell tracking, cell morphology and cell segmentation analysis, object detection, flow analysis (PIV), and traction force analysis. Extensive experience in data analysis, statistical analysis, and data plotting/visualization. Matlab. ImageJ. Mathematica. Ilastik Machine Learning. Leica LASX. MicroManager. LabView. FlowJo. AutoCAD. Fusion 360.

Microfluidics: Experience with microfluidics for cell separation and bio-material applications. Fabrication techniques including photolithography, spin-coating, clean-room work, rapid PDMS microfluidic prototyping, and magnetic microbead based separation.

Materials Science: 3D printing biomaterials. Material characterizations such as rheology and micro rheology. Emulsions and vesicle preparations. Microbead functionalization and passivation. Spectrophotometers. Monolayer stress and traction force microscopy for characterizing culture tissue material properties.

Administrative: Experience with project leadership and personnel mentorship. Project timeline and resource requirement needs. Excellence in scientific communication and presentation in both written and spoken formats. Skilled in Microsoft Office Suite (Word, Excel, PowerPoint). Slack. Asana project management. Adobe Illustrator. Benchling electronic lab notebook. Grant writing. Publication preparation.

SELECTED PUBLICATIONS

My research has resulted in publication in many high impact journals such as *Nature*, *Nature Materials*, and *Science* and have been cited over 1700 times since 2015. Full list available upon request or on [my website](#).

DeCamp, S. J., Tsuda, V. M. K., Ferruzzi, J., Koehler, S. A., Giblin, J. T., Roblyer, D., Zaman, M. H., Weiss, S. T., DeMarzio, M., Park, C. Y., Ogassavara, N. C., Mitchel, J., Butler, J. P. & Fredberg, J. J. Epithelial layer unjamming shifts energy metabolism toward glycolysis. *Scientific Reports* 10, 18302 (2020).

Mitchel, J. A., Das, A., O'Sullivan, M. J., Stancil, I. T., **DeCamp, S. J.**, Koehler, S., Ocaña, O. H., Butler, J. P., Fredberg, J. J., Nieto, M. A., Bi, D. & Park, J.-A. In primary airway epithelial cells, the unjamming transition is distinct from the epithelial-to-mesenchymal transition. *Nature Communications* 11, 5053 (2020).

Atia, L., Bi, D., Sharma, Y., Mitchel, J. A., Gweon, B., A. Koehler, S., **DeCamp, S. J.**, Lan, B., Kim, J. H., Hirsch, R., Pegoraro, A. F., Lee, K. H., Starr, J. R., Weitz, D. A., Martin, A. C., Park, J.-A., Butler, J. P. & Fredberg, J. J. Geometric constraints during epithelial jamming. *Nature Physics* 14, 613–620 (2018).

Wu, K.-T., Hishamunda, J. B., Chen, D. T. N., **DeCamp, S. J.**, Chang, Y.-W., Fernández-Nieves, A., Fraden, S. & Dogic, Z. Transition from turbulent to coherent flows in confined three-dimensional active fluids. *Science* 355, 1979 (2017).

DeCamp, S. J., Redner, G. S., Baskaran, A., Hagan, M. F. & Dogic, Z. Orientational order of motile defects in active nematics. *Nature Materials* 14, 1110–1115 (2015).

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

Sanchez, T., Chen, D. T. N., **DeCamp, S. J.**, Heymann, M. & Dogic, Z. Spontaneous motion in hierarchically assembled active matter. *Nature* 491, 431–434 (2012).

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

SELECTED PRESENTATIONS

Physical Sciences Oncology Network Junior Investigator Meeting – Bethesda, MD	August 2019
Squishy Physics Seminar – Invited Speaker – Harvard University, Cambridge, MA	July 2019
ATS Annual Meeting – Dallas, TX	May 2019
APS March Meeting – Boston, MA	March 2019
Harvard School of Public Health – Environmental Health Department Retreat, Boston, MA	December 2018

8 th World Congress of Biomechanics – Dublin, Ireland	July 2018
APS March Meeting – Baltimore, MD	March 2016
Soft Condensed Matter Seminar – Tufts University, Medford, MA	October 2015
Gordon Research Seminar (GRS) Soft Matter – Colby-Sawyer College, NH	August 2015
APS March Meeting – San Antonio, TX	March 2015
ACS Active Colloids Meeting – University of Pennsylvania, Philadelphia, PA	June 2014
23 rd Berko Symposium – Berko Prize Award – Brandeis University, Waltham MA	May 2014
APS March Meeting – Denver, CO	March 2014
15 th Annual Greater Boston Area Statistical Mechanics Meeting (GBASM)	October 2013
Gordon Research Conference (GRC) Liquid Crystals – U. of New England, ME	June 2013
52 nd New England Complex Fluids – Brandeis University, Waltham MA	September 2012
NIH NIBIB Training Grantees Meeting – NIH Campus, Bethesda, MD (poster)	June 2012
Active Jammed Systems – New York University, New York, NY (poster)	May 2012

SCIENCE OUTREACH

Lead STEM Outreach Opportunities at Ohana Biosciences	2021
Boston Soft Matter Socials – Co-founder and organizer	2016-2019
Organized Biological Soft Matter Meeting Nov 17, 2017 @MIT	2017
Stratton Elementary School Science Festival – Arlington, MA	2014- 2015
Acton Discovery Museum – tabletop demos – Acton, MA	2011-2014
Lawrence Science Program – Intensive MCAS Science Bootcamp – classroom lessons	2014
Geek is Glam – Girl Scout Camp Event – stage demos – Worcester, MA	2013
Boston Children’s Museum – Tinker Tent – Electricity and Circuits Demo	2013
Boston Common Halloween at Frog Pond – Boston, MA	2013
PBS/NOVA – Making Stuff – tabletop demos – Boston Museum of Science	2011

PERSONNEL MANAGEMENT & MENTORSHIP

Lehman Foundation Research Mentor Supervised 2 student research projects and mentored career development activities	2018-2019
Harvard University Science Education Undergraduate Mentoring Workshop Series Earned a certificate in undergraduate research mentorship from esteemed Harvard program	2018
HHMI Quantitative Biology Research Community Mentor Mentored 6 students in a laboratory-based experiential learning program	2015
Active Sample Bootcamps for the Brandeis NSF MRSEC Trained dozens of external researchers in active sample preparation	2012-2015
Undergraduate Research Mentor in the Dogic Lab at Brandeis University Supervised 3 undergraduates resulting in 1 publication	2012-2015
Teaching Assistant for Introduction to Physics Lab at Brandeis University Instructed a physics lab designed for pre-med students to learn concepts in physics.	2010-2011