Stephen J. DeCamp, PhD

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EXECUTIVE SUMMARY

- Pioneering R&D leader helping build and establish AI-driven drug discovery and generative biology as an industry standard, with a proven track record of establishing the foundational infrastructure required to scale machine-learning-guided therapeutic development.
- Strategic scientist specialized in architecting closed-loop ML/wet-lab feedback systems, data-hungry experimental platforms, and automated high-throughput assay pipelines to power generative protein design at enterprise scale.

RESEARCH & INDUSTRY EXPERIENCE

Generate Biomedicines, Inc. — Somerville, MA

Senior Scientist II *— Jun 2024 – Present*

- Lead high-throughput assay innovation, microfluidic platform engineering, and integration of automation into pipelines to support generative programmable biology and therapeutic discovery.
- Pioneer and scale foundational infrastructure for real-time closed-loop ML/wet-lab feedback loops, integrating biophysics, material science, and computational protein design to transform AI-driven drug discovery into an industry standard.

Senior Scientist I *— Sep 2022 – Jun 2024*

- Mentored interdisciplinary teams of scientists and engineers to define strategy, timeline execution, and resource allocation for scaling ML-driven experimental biology capabilities.

Scientist II – Microfluidic Assay Development *— Jul 2021 – Sep 2022*

- Designed custom microfluidic devices and functionalized surface chemistry assays for high-precision separations and single-cell measurements, laying early foundational infrastructure for high-throughput AI data ingestion.

Harvard T.H. Chan School of Public Health — Boston, MA

Research Associate *— Sep 2019 – Feb 2021*

Postdoctoral Research Fellow *— Sep 2016 – Aug 2019*

- Initiated and led interdisciplinary research projects at the interface of materials science, physics, and epithelial cell biology.
- Assembled and directed a multidisciplinary research team; served as Principal Investigator on multiple projects and competitive grants.
- Developed novel bio-assays and automated Matlab image-analysis pipelines for cell metabolism, cellular tracking, traction force microscopy, and tissue mechanics.
- Founded and led the Boston Soft Matter Socials meetup group, fostering cross-disciplinary synergy across physics, engineering, and biology.

Brandeis University — Waltham, MA

Graduate Research Associate *— Sep 2010 – Aug 2016*

- Pioneered advances in bioengineered active materials, resulting in high-impact publications in Nature, Science, and Nature Materials.

- Designed and implemented custom instrumentation for optics, micro-rheology, 3D bioprinting, and microfluidics.
- Coded quantitative algorithms for statistical analysis, micro-rheology, and multi-object tracking; supervised undergraduate research projects.

Michigan State University — East Lansing, MI
Undergraduate Research Assistant *— Aug 2006 – May 2010*

- Built and maintained laser confocal optical setups; fabricated silica microfluidic devices using cleanroom photolithography and D-RIE etching.

BOARD LEADERSHIP & COMMUNITY OUTREACH

CoLAB High School STEM Career Collaboration — Watertown, MA
Member, Board of Directors *— Jan 2026 – Present*

- Provide strategic governance, organizational leadership, and program planning for a non-profit initiative connecting Watertown High School students with local biotech and STEM industry professionals.
- Lead hands-on experimental workshops for CoLAB Club (e.g., Tissue Biomechanics & Tumor Mapping), designing custom 3D-printed experimental rigs and introducing students to physical biology concepts.
- Spearhead volunteer recruitment initiatives, expanding industry professional engagement across Greater Boston biotech companies to support STEM career exploration and mentee workshops.
- Serve as a 1:1 STEM mentor and Career Exploration presenter to bridge the gap between high school education and cutting-edge biopharmaceutical research careers.

EDUCATION & TRAINING

Harvard T.H. Chan School of Public Health — Postdoctoral Fellow, Molecular & Integrative Physical Sciences (2016 – 2019)

Brandeis University — Ph.D. in Physics (Quantitative Biology specialization) (2010 – 2016)

Michigan State University — B.S. in Physics and Astrophysics (2006 – 2010)

TECHNICAL SKILLS

Biophysics & Generative Biology: Generative biology, ML-driven protein design, closed-loop wet-lab/ML feedback systems, automated high-throughput assay development for training data generation, cell energy metabolism, biosensors, flow cytometry (FACS), protein purification, cell culture & tissue engineering.

Optics & Advanced Microscopy: Fluorescence, confocal microscopy, TIRF, phase contrast, polarization light microscopy, CD spectroscopy, custom optical instrument design & build.

Computational & Structural Optimization: Python, Cursor, AI-assisted (vibe) coding, automated wet-lab-to-AI data pipelines, data analysis & delivery, computer-guided structural optimization, Matlab, ImageJ/Fiji, Mathematica, Ilastik Machine Learning, PIV flow analysis, traction force microscopy, object tracking/segmentation, LabView, AutoCAD, Fusion 360.

Microfluidics & Fabrication: Photolithography, cleanroom fabrication, PDMS prototyping, magnetic microbead separation, surface functionalization.

Materials Science: 3D bioprinting, bulk & micro-rheology, active nematics, emulsions/vesicle preparation, monolayer stress microscopy.

SELECTED PUBLICATIONS & PRESENTATIONS

Over 1,700 citations in top-tier journals including Nature, Nature Materials, Nature Physics, and Science. Full list available upon request.

- DeCamp, S. J. et al. Epithelial layer unjamming shifts energy metabolism toward glycolysis. *Scientific Reports* 10, 18302 (2020).
- Mitchel, J. A., ..., DeCamp, S. J. et al. In primary airway epithelial cells, the unjamming transition is distinct from EMT. *Nature Communications* 11, 5053 (2020).
- Atia, L., ..., DeCamp, S. J. et al. Geometric constraints during epithelial jamming. *Nature Physics* 14, 613–620 (2018).
- Wu, K.-T., ..., DeCamp, S. J. et al. Transition from turbulent to coherent flows in confined active fluids. *Science* 355, 1979 (2017).
- DeCamp, S. J. et al. Orientational order of motile defects in active nematics. *Nature Materials* 14, 1110–1115 (2015).

PATENTS & PATENT APPLICATIONS

Patent applications assigned to Generate Biomedicines, Inc. (Patent Pending):

- DeCamp, S. J., McGrath, K., & Dillman, A. Image-based cell sorting systems and methods. U.S. Patent Application (Attorney Docket No. 2017408-0025 / -0030), assigned to Generate Biomedicines, Inc., filed 2024. Patent Pending.
- DeCamp, S. J., McGrath, K., Dillman, A., Poelwijk, F., & Wang, C. High-throughput bio-assay automation / microarray platform. U.S. Patent Application (Attorney Docket No. 2017408-0031 / -0068; App. No. 19/257,179), assigned to Generate Biomedicines, Inc., filed 2024–2026. Patent Pending.