

NATHANIEL P. SKILLIN
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EDUCATION

UNIVERSITY OF COLORADO

MD-PhD Student; Medical Scientist Training Program 2018–Present
Graduate Student; Department of Chemical and Biological Engineering 2020–Present
Advisors: Timothy J. White, Ph.D. & Kristi S. Anseth, Ph.D.
Cumulative GPA: **3.97/4.00**

TUFTS UNIVERSITY

B.S. Biomedical Engineering, *summa cum laude* 2012–2016
Cumulative GPA: **3.85/4.00**

EXPERIENCE

Graduate Research Assistant

2020–Present
Drs. Timothy J. White & Kristi S. Anseth, Chemical and Biological Engineering, University of Colorado Boulder
“Biomedical applications of liquid crystalline elastomers”

Technical Research Assistant

2016–2018
Dr. Howard L. Weiner, Ann Romney Center for Neurologic Diseases, Brigham and Women’s Hospital
“Targeting latency-associated peptide promotes antitumor immunity”

Senior Design Project

2015–2016
Drs. Fiorenzo G. Omenetto, David L. Kaplan, Biomedical Engineering, Tufts University
“Inkjet printing silk-stabilized antibody-conjugated polydiacetylene vesicles for colorimetric pathogen detection”

Undergraduate Internships

2014–2016
Sean Lyons & Nicole Jackson, Pfizer Inc., Andover, MA
Process Engineering and Analytics; Process Monitoring and Informatics

Undergraduate Research

2013–2015
Drs. Fiorenzo G. Omenetto, David L. Kaplan, Biomedical Engineering, Tufts University
“Implantable silk-based microelectrode array for biocompatible neural recording”
“Efficacy of DC-driven electric fields to stimulate wound repair in a 3D human skin model”

Undergraduate Research

2013
Dr. Katherine Kuo, Biomedical Engineering, Tufts University
“Histological analysis of tendon development in chick embryo”

Independent Study

2011–2012
Dr. Edward Bilsky, Biomedical Sciences, University of New England
“In-vivo assessment of novel mu-opioid receptor agonists and antagonists”

PUBLICATIONS

- Günay, K. A., Chang, T., **Skillin, N. P.**, Rao, V. V., MacDougall, L. J., Cutler, A. A., Silver, J. S., Brown, T. E., Zhang, C., Yu, C., Olwin, B. B., Boyden, E. S., Anseth, K. S. (2023). Photo-expansion microscopy enables super-resolution imaging of cells embedded in 3D hydrogels. *Nature Materials*.
- Nelson, B. R., Kirkpatrick, B. E., Miksch, C. E., Davidson, M. D., **Skillin, N. P.**, Hach, G. K., Khang, A., Hummel, S. N., Fairbanks, B. D., Burdick, J. A., Bowman, C. N., Anseth, K. S. (2023). Photoinduced Dithiolane Crosslinking for Multiresponsive Dynamic Hydrogels. *Advanced Materials*, 2211209, 1-15.

3. Miksch, C. E., **Skillin, N. P.**, Kirkpatrick, B. E., Hach, G. K., Rao, V. V., White, T. J., & Anseth, K. S. (2022). 4D Printing of Extrudable and Degradable Poly(Ethylene Glycol) Microgel Scaffolds for Multidimensional Cell Culture. *Small*, 2200951, 1–13.
4. Hebner, T. S., Fowler, H. E., Herbert, K. M., **Skillin, N. P.**, Bowman, C. N., & White, T. J. (2021). Polymer Network Structure, Properties, and Formation of Liquid Crystalline Elastomers Prepared via Thiol – Acrylate Chain Transfer Reactions. *Macromolecules*.
5. Gabriely, G., Ma, D., Siddiqui, S., Sun, L., **Skillin, N. P.**, Abou-El-Hassan, H., Moreira, T. G., Donnelly, D., da Cunha, A. P., Fujiwara, M., Walton, L. R., Patel, A., Krishnan, R., Levine, S. S., Healy, B. C., Rezende, R. M., Murugaiyan, G., Weiner, H. L. (2021). Myeloid cell subsets that express latency-associated peptide promote cancer growth by modulating T cells. *iScience*, 24(11), 103347.
6. Garo, L. P., Ajay, A. K., Fujiwara, M., Gabriely, G., Raheja, R., Kuhn, C., Kenyon, B., **Skillin, N. P.**, Kadowaki-Saga, R., Saxena, S., Murugaiyan, G. (2021). MicroRNA-146a limits tumorigenic inflammation in colorectal cancer. *Nature Communications*, 12(2419).
7. Rezende, R. M., Lanser, A. J., Rubino, S., Kuhn, C., **Skillin, N. P.**, Moreira, T. G., Liu, S., Gabriely, G., David, B. A., Menezes, G.B., Weiner, H. L. (2018). $\gamma\delta$ T cells control humoral immune response by inducing T follicular helper cell differentiation. *Nature Communications*, 9(1).
8. Gabriely, G., da Cunha, A. P., Rezende, R. M., Kenyon, B., Madi, A., Vandeventer, T., **Skillin, N. P.**, Rubino, S., Garo, L., Mazzola, M. A., Kolypetri, P., Lanser, A. J., Moreira, T., Faria, A. M. C., Lassmann, H., Kuchroo, V., Murugaiyan, G., Weiner, H. L. (2017). Targeting latency-associated peptide promotes antitumor immunity. *Science Immunology*, 2(11).

PRESENTATIONS

38th Annual MD-PhD National Student Conference – Copper, CO	July 2023
Poster – “Stiffness anisotropy coordinates supracellular contractility driving long-range myotube-ECM alignment”	
Society for Biomaterials Annual Meeting – San Diego, CA	April 2023
Oral Presentation – “Reciprocal Cell-ECM Dynamics Drive Nematic Ordering of C2C12 Myotubes on Anisotropic Liquid Crystalline Polymer Networks”	
Rocky Mountain Biomaterials Day – Aurora, CO	March 2023
Oral Presentation – “Collective Cellular Dynamics Drive Nematic Ordering of C2C12 Myotubes on Anisotropic Liquid Crystalline Polymer Networks”	
5th Annual University of Colorado MSTP Retreat – Aurora, CO	February 2023
Poster – “Collective cellular dynamics drive nematic ordering of C2C12 myotubes on anisotropic liquid crystalline polymer networks”	
University of Colorado MSTP Seminar Series – Aurora, CO	September 2022
Oral Presentation – “Collective cell mechanosensing of stiffness anisotropy drives myotube alignment on monodomain LCNs”	
37th Annual MD-PhD National Student Conference – Copper, CO	July 2022
Poster – “Collective cell mechanosensing drives muscle myotube alignment on monodomain liquid crystal polymer networks”	
Materials Research Society Spring Meeting – Honolulu, HI	May 2022
Poster – “Molecular engineering of liquid crystal-poly(ethylene glycol) (LC-PEG) block copolymers for 3D printed biomaterial scaffolds”	

Society for Biomaterials - University of Colorado Anschutz Chapter Meeting – Virtual Oral Presentation – “Liquid Crystal Polymer Networks for Muscle Tissue Engineering”	March 2022
4th Annual University of Colorado MSTP Retreat – Aurora, CO Oral Presentation – “Liquid Crystal Polymer Networks for Muscle Tissue Engineering”	February 2022
American Chemical Society Fall Meeting – Virtual Poster – “Liquid crystal polymers as biomaterial scaffolds”	August 2021
3rd Annual University of Colorado MSTP Retreat – Aurora, CO Poster – “NIR-Responsive LCEs”	February 2021
University of Colorado MSTP Seminar Series – Aurora, CO Oral Presentation – “Medical applications of liquid crystal elastomers”	September 2020
2nd Annual University of Colorado MSTP Retreat – Aurora, CO Poster – “Photopolymerized hydrogels for expansion microscopy”	February 2020
University of Colorado MSTP Seminar Series – Aurora, CO Oral Presentation – “Iterative expansion microscopy using photopolymerized hydrogels”	November 2019
Medical History Seminar Series – Somerville, MA Oral Presentation – “The Potent Poppy! The Medicinal Use of Opium in Antiquity”	May 2016
Senior Design Day – Somerville, MA Oral Presentation – “Inkjet Printing Antibody-Conjugated Polydiacetylene Vesicles Stabilized in Silk Fibroin for the Colorimetric Detection of Staphylococcus Aureus”	May 2016

HONORS & AWARDS

F30 Fellowship Award – National Heart, Lung, and Blood Institute	2022–2026
First place, Up Close Competition – University of Colorado Boulder	2021
David W. Talmage, M.D. Excellence in Immunology Memorial Award – CU Anschutz School of Medicine	2020
First place, Interprofessional Ethics Case Competition – CU Anschutz School of Medicine	2018
Edward A. Ellis Jr. Endowed Scholarship Recipient – Tufts University	2016
Inter-Greek Scholastic Achievement Award – Tufts University	2015

LEADERSHIP, SERVICE, & OUTREACH

American Physician Scientists Association Undergraduate Mentorship Program	2022–Present
Anschutz Medical Campus Pre-Doc Mentor	2022–Present
Guest Lecturer, University of Colorado Boulder Science Discovery Course	2022
University of Colorado MSTP Admissions Committee	2021–2023
Bryant Webster Student Mentorship Program	2019–Present
University of Colorado MSTP Curriculum Reform Committee	2019–2021
Boston Cares Volunteer	2016–2018
Somerville Public School District Volunteer	2014–2016

PROFESSIONAL AFFILIATIONS

Society for Biomaterials	2022–Present
American Physician Scientists Association	2022–Present
Materials Research Society	2021–Present
American Chemical Society	2021–Present
American Medical Association	2018–Present
Tau Beta Pi Association	2014–Present
Biomedical Engineering Society	2014–Present