**Curriculum Vitae**

**Shelly R. Peyton, PhD**

University of Massachusetts

Department of Chemical Engineering

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**PROFESSIONAL EXPERIENCE**

7/24-present **Professor and Department Chair**, Department of Biomedical Engineering, Tufts University

9/23-present **Provost Professor**, Department of Chemical Engineering, University of Massachusetts Amherst

9/23-present **Visiting Professor**, Department of Biomedical Engineering, Tufts University

9/21-present **Professor**, Department of Chemical Engineering, University of Massachusetts Amherst

7/20-6/23 **Armstrong Professional Development Professor**, University of Massachusetts Amherst

1/11-present **Graduate Program Faculty**, Molecular and Cellular Biology Graduate Program, University of Massachusetts Amherst

1/20-present **Adjunct Faculty Member**, Department of Biomedical Engineering, University of Massachusetts Amherst

3/19-present **PI,** PREP Program (NIH R25), University of Massachusetts Amherst

9/16-present **MPI,** Biotechnology Training Program (NIH T32), University of Massachusetts Amherst

9/16-12/21 **Graduate Program Director**, Department of Chemical Engineering, University of Massachusetts Amherst

6/16-12/21 **Co-Director,** Models to Medicine, Institute for Applied Life Sciences, University of Massachusetts Amherst

9/16-8/21 **Associate Professor**, Department of Chemical Engineering, University of Massachusetts Amherst

1/11-9/16 **Assistant Professor**, Department of Chemical Engineering, University of Massachusetts Amherst

**EDUCATION AND TRAINING**

Post-doc 2007-10 Massachusetts Institute of Technology, Biological Engineering, Advisors Drs. Douglas Lauffenburger and Linda Griffith

Ph.D., 2007 University of California, Irvine, Chemical and Biochemical Engineering, Advisor Dr. Andrew Putnam

M.S., 2004 University of California, Irvine, Chemical and Biochemical Engineering

B.S., 2002 Northwestern University, Chemical Engineering

**HONORS AND AWARDS**

Provost Professor (2023)

AIChE Long Range Programming Officer (2023-2027)

AIChE 15D/E Division Plenary Award (2022)

AIChE Division 15 Service Award (2022)

Conti Fellow (2022-23)

BMES Fellow (2021)

Armstrong Professorship (2020)

AIMBE fellow (2020)

Kavli Fellow (2019)

Mellichamp Lecturer, Purdue University Chemical Engineering (2018)

UMass College of Engineering Outstanding Teaching Award (2018)

Cellular and Molecular Bioengineering Young Innovator Award (2015)

National Science Foundation CAREER Award (2015-20)

UMass Award for Outstanding Accomplishments in Research and Creative Activity (2014)

UMass College of Engineering Barbara and Joseph Goldstein Outstanding Junior Faculty Award (2014)

National Institutes of Health New Innovator Award (2013-18)

Pew Biomedical Scholar (2013-17)

Barry and Afsaneh Siadat Career Development Fellow (2012-17)

Society for Physical Regulation of Cell Biology Rising Star Award (2012)

National Institutes of Health/Ruth L. Kirchstein (NIGMS) Postdoctoral Fellow (2008-10)

Graduate Assistantship in Areas of National Need (GAANN) Fellow (2006-2007)

National Achievement Rewards for College Scientists (ARCS) Foundation, Inc. Fellow (2004-06)

Biomedical Engineering Society Outstanding Graduate Student Research Award (2005)

**PROFESSIONAL MEMBERSHIPS**

NIH BTSS Study Section (Standing member) 2017-2021

AIChE 2004-present

BMES 2004-present

AACR 2012-present

Biotechnology Training Grant Program, MPI, UMass-Amherst 2015-present

Chemistry-Biology Interface Training Grant Program, UMass-Amherst 2011-present

**PEER-REVIEWED PUBLICATIONS \*corresponding author**

1. Linnes, J.C.\*, Moore, E., Porras, A.M., Wayne, E., Boyle, P.M., Chow, L.W., Maisel, K., Peyton, S.R., Stabenfeldt, S.E., Stevens, K.R., Winter, J.O., Willits, R.K.\*, (Accepted) “Framework for Department-level Accountability to Diversify Engineering” Nature Reviews Bioengineering.
2. Richbourg, N.R., Irakoze, N., Kim, H., and Peyton, S.R.\*, (2024) *Science Advances* “Outlook and opportunities for engineered environments of breast cancer dormancy”.
3. Peyton, S.R.\*, Chow, L.W., Finley, S.D., Ford Versypt, A.N., Hill, R., Kemp, M.L., Langer, E.M., McGuigan, A.P., Meyer, A.S., Seidlits, S.K., Roy, K.\*, and Mumenthaler, S.M.\*, (2023) *Nature Reviews Bioengineering* “Synthetic, Living Materials to Model the Tumor Microenvironment” doi: 10.1038/s44222-023-00105-w

# Brian Aguado, Belinda Akpa, Gabriella Fleming, Erika Moore, Ana Porras, Patrick Boyle, Deva Chan, Naomi Chesler, Karen Christman, Tejal Desai, Brendan Harley, Gregory Hudalla, Megan Killian, Katharina Maisel, Kristen Maitland, Shelly Peyton, Beth Pruitt, Sarah Stabenfeldt, Kelly Stevens, Audrey Bowden, and Elizabeth Cosgriff-Hernandez\* (2023) “Equitable hiring strategies towards a diversified faculty” *Nature Biomedical Engineering* doi: 10.35542/osf.io/8hcw5

1. Kundu, A.N., Dougan, C.E., Mahmoud, S., Kilik, A., Panagiotou, A., Irakoze, N., Richbourg, N., and Peyton, S.R.\*, (2023) “Tenascin-C activation of lung fibroblasts in a 3D synthetic lung extracellular matrix mimic” *Advanced Materials* doi: 10.1101/2023.02.24.529926

# Adler, F.R., Anderson, A.R.A., Bhushan, A., Bogdan, P., Bravo-Cordero, J.J., Brock, A., Chen, Y., Cukierman, E., DelGiorno, K.E., Denis, G.V., Ferrall-Fairbanks, M.C., Gartner, Z.J., Germain, R.N., Gordon, D.M., Hunter, G., Jolly, M.K., Karacosta, L.G., Mythreye, K., Katira, P., Kulkarni, R.P., Kutys, M.L., Lander, A.D., Laughney, A.M., Levine, H., Lou, E., Lowenstein, P.R., Masters, K.S., Pe’er, D., Peyton, S.R., Platt, M.O., Purvis, J.E., Quon, G., Richer, J.K., Riddle, N.C., Rodriguez, A., Snyder, J.C., Szeto, G.L., Tomlin, C.J., Yanai, I., Zervantonakis, I.K., Dueck, H., (2023) “Modeling collective cell behavior in cancer: Perspectives from an interdisciplinary conversation” *Cell Systems* doi: 10.1016/j.cels.2023.03.002.

# Sonu, K.P., Zhou, L., Biswas, S., Klier, J., Balazs, A.C., Emrick, T., and Peyton, S.R.\*, (2023) “Strain-stiffening hydrogels with dynamic, secondary cross-linking” *Langmuir* doi: 10.1021/acs.langmuir.2c03117

# Kim, H., Wirasaputra, A., Mohammadi, F., Kundu, AN, Esteves, J.A.E., Heiser, L.M., Meyer, A.S., and Peyton, S.R.\*, (2023) “Live cell lineage tracing of dormant cancer cells” *Advanced Healthcare Materials* doi: 10.1101/2022.10.08.511405

1. Peyton, S.R.\*, Platt, M.O.\*, and Cukierman, E.\*, (2023) “Challenges and opportunities modeling the dynamic tumor matrisome” *BMEF* doi: 10.34133/bmef.0006

# Leighow, S.M., Landry, B., Lee, M.J., Peyton, S.R., and Pritchard, J.R.\* (2022) “Agent-Based Models Help Interpret Patterns of Clinical Drug Resistance by Contextualizing Competition Between Distinct Drug Failure Modes” *Cellular and Molecular Bioengineering* doi: 10.1007/s12195-022-00748-6

1. Fogg, K.D.\*, Tseng, N-H, S.R., Pieper Holeman, Shannon Theresa McLoughlin, John P Fisher, Allison Sutton, Ariella Shikanov, Juan S Gnecco, Katrina M Knight, Emily Slaby, Jessica D Weaver, Nicole Hashemi, Yali Zhang, Michael D House, Brandon J Vogt, Brian A Aguado, John Bradford, Jennifer L Robinson, Patricia K Thomas, Anthony G Lau, Michelle L Oyen\* (2022) “Roadmap on Biomaterials for Women’s Health” *Journal of Physics: Materials* doi: 10.1088/2515-7639/ac90ee

# Creixell, M., Kim, H., Mohammadi, F., Peyton, S.R., and Meyer, A.S.\* (2022) “Systems approaches to uncovering the contribution of environment-mediated drug resistance”, *Current Opinion in Solid State and Materials Science* doi: 10.1016/j.cossms.2022.101005 PMID: 36321161; PMCID: PMC9620953

# Dougan, C.E., Song, Z., Fu, H., Crosby, A.J., Cai, S., Peyton, S.R.\* (2022) “Cavitation induced fracture of intact brain tissue”, *Biophysical Journal* doi: 10.1101/2022.03.15.484522 PMID: 35711142 PMCID: PMC9382329

# Pritchard, J.R., Lee, M.J., and Peyton. S.R.\* (2022) “Materials-driven approaches to understand extrinsic drug resistance in cancer”, *Soft Matter* doi:10.1039/D2SM00071G PMID: 35445686

# PMCID: PMC9380814

# Jansen, L.E., Kim, H., Hall, C.L., McCarthy, T., Lee, M., and Peyton, S.R.\*, (2022) “A poly(ethylene glycol) three-dimensional bone marrow hydrogel”, *Biomaterials* doi: [https:// doi.org/10.1016/j.biomaterials.2021.121270](https://doi.org/10.1101/275842) PMID: 34890973 PMCID: PMC8890749

1. Schwartz, A.D., Adusei, A., Tsegaye, S., Moskaluk, C.A., Schnedier, S.S., Platt, M.O., Seifu, D., Peyton, S.R.\*, and Babbitt, C.C.\*, (2021) “Genetic Mutations Associated with Hormone-Positive Breast Cancer in a Small Cohort of Ethiopian Women,” *Annals of Biomedical Engineering* https://doi.org/10.1007/s10439-021-02800-4 PMID: 34142276
2. Mijailovic, A.S., Galarza, S., Raayai-Ardakani, S., Birch, N.P., Schiffman, J.D., Crosby, A.J., Cohen, T., Peyton, S.R.\*, and Van Vliet, K.J.\*, (2021) “Localized characterization of brain tissue mechanical properties by needle induced cavitation rheology and volume controlled cavity expansion,” *Journal of the Mechanical Behavior of Biomedical Materials* doi: 10.1016/j.jmbbm.2020.104168 PMID: 33218928
3. King, M.R., Peyton, S.R., and Simon, S.I., “The 2020 Young Innovators of Cellular and Molecular Bioengineering,” (2020) *Cellular and Molecular Bioengineering* https://doi.org/10.1007/s12195-020-00659-4 PMID: 33184572 PMCID: PMC7596122
4. Tiwari, S., Kazemi-Moridani, A., Zheng, Y., Barney, C.W., McLeod, K., Dougan, C.E., Crosby, A.J., Tew, G.N., Peyton, S.R., Cai, S., and Lee, J-H.\* (2020) “Seeded laser-induced cavitation for studying high-strain-rate irreversible deformation of soft materials,” *Soft Matter* doi: 10.1039/D0SM00710B PMID: 33021618
5. Hasnain, Z., Fraser, A.K., Georgess, D., Choi, A., Macklin, P., Bader, J.S., Peyton, S.R., Ewald, A., and Newton, P.K.\*, (2020), “OrgDyn: feature- and model-based characterization of spatial and temporal organoid dynamics” *Bioinformatics* doi: 10.1093/bioinformatics/btaa096 PMID: 32091578 PMCID: PMC7214016

# Barney, C.W., Dougan, C.E., McLeod, K.R., Kazemi-Moridani, A., Zheng, Y., Ye, Z., Tiwari, S., Sacligi, I., Riggleman, R.A., Cai, S., Lee, J-H., Peyton, S.R., Tew, G., and Crosby, A.J.\* (2020), “Cavitation in soft matter” *PNAS* doi: 10.1073/pnas.1920168117 PMID: 32291337 PMCID: PMC7196784

# Bittner, K.R., Jimenez, J.M., and Peyton, S.R.\*, (2020) “Vascularized biomaterials to study cancer metastasis” *Advanced Healthcare Materials*. doi: 10.1002/adhm.201901459 PMID: 31977160 PMCID: PMC7899188

# Barney, L.E., Hall, C.L., Schwartz, A.D., Parks, A.N., Sparages, C., Galarza, S., Platt, M.O., Mercurio, A.M., and Peyton, S.R.\* (2020) “Tumor cell-organized fibronectin is required to maintain a dormant breast cancer population”, *Science Advances* doi: https://doi.org/10.1101/686527 PMID: 32195352 PMCID: PMC7065904

# Galarza, S., Crosby, A.J., Pak, C.H., and Peyton, S.R.\*, (2020) “Control of Astrocyte Quiescence and Activation in a Synthetic Brain Hydrogel” *Advanced Healthcare Materials.* DOI: 10.1101/785683 PMID: 31943839 PMCID: PMC8240961

# Angelou, C.C., Wells, A.C., Vijayaraghavan, J., Dougan, C.E., Lawlor, R., Iverson, E., Lazarevic, V., Kimura, M.Y., Peyton, S.R., Minter, L.M., Osborne, B.A., Pobezinskaya, E.L., Pobezinsky, L.A.\* (2020) “Differentiation of Pathogenic Th17 Cells is Negatively Regulated by Let-7 MicroRNAs in a Mouse Model of Multiple Sclerosis”, *Frontiers in Immunology* doi: 10.3389/fimmu.2019.03125 PMID: 32010153 PMCID: PMC6978752

# Lele, T.P., Brock, A., and Peyton, S.R. (2020) “Emerging concepts and tools in cell mechanomemory”, *Annals of Biomedical Engineering* doi: 0.1007/s10439-019-02412-z PMID: 31745676

# Galarza, S., Kim, H., Atay, N., Peyton, S.R.\*, and Munson, J.M.\*, (2019) “2D or 3D? How *in vitro* cell motility is conserved across dimensions, and predicts *in vivo* invasion”, *Bioengineering & Translational Medicine* doi: 10.1002/btm2.10148 PMID: 31989037 PMCID: PMC6971446

# Brooks, E.A., Galarza, S., Gencoglu, M.F., Cornelison, R.C., Munson, J.M.\*, Peyton, S.R.\*, (2019) “Applicability of drug response metrics for cancer studies using biomaterials”, *Philosophical Transactions of the Royal Society B* doi: https://doi.org/10.1098/rstb.2018.0226 PMID: 31431182 PMCID: PMC6627013

# Brooks, E.A., Gencoglu, M.F., Corbett, D.C., Stevens, K.R., Peyton, S.R.\*, (2019)“An omentum-inspired 3D PEG hydrogel for identifying ECM drivers of drug resistant ovarian cancer”, *APL Bioengineering* doi: 10.1063/1.5091713 PMID: 31263798 PMCID: PMC6594836

# Zhu, P., Tseng, N.-H., Xie, T., Li, N., Fitts-Sprague, I., Peyton, S.R., Sun, Y., (2019) “Biomechanical microenvironment regulates fusogenicity of breast cancer cells”, *ACS Biomaterials Science and Engineering*, doi: 10.1021/acsbiomaterials.8b00861 PMID: 33438422

# Carpenter, R.A., Kwak, J-G., Peyton, S.R., Lee, J.\*, (2018) “Implantable pre-metastatic niches for the study of microenvironmental regulation of disseminated human tumour cells” *Nature Biomedical Engineering* doi: 10.1038/s41551-018-0307-x PMID: 30906645 PMCID: PMC6424369

# Polio, S., Kundu, A., Dougan, C., Birch, N., Aurien-Blajeni, D.E., Schiffman, J., Crosby, A., and Peyton, S.R.\*, (2018) “Cross-platform mechanical characterization of lung tissue” *PLOSOne* DOI: 10.1371/journal.pone.0204765 PMID: 30332434 PMCID: PMC6192579

# Landry, B.D., Leete, T., Richards, R., Cruz-Gordillo, P., Schwartz, H.R., Honeywell, M.E., Ren, G., Schwartz., A.D., Peyton, S.R., Lee, M.J.\*, (2018) Tumor‐stroma interactions differentially alter drug sensitivity based on the origin of stromal cells, *Molecular Systems Biology* doi: 10.15252/msb.20188322 PMID: 30082272 PMCID: PMC6078165

# Jansen, L.E., Amer, L.D., Chen, E.Y-T., Nguyen, T.V., Saleh, L., Emrick, T.S., Liu, W.F., Bryant, S.J., Peyton, S.R.\*, (2018) “Zwitterionic PEG-PC hydrogels modulate the foreign body response in a modulus-dependent manner” *Biomacromolecules* DOI: 10.1021/acs.biomac.8b00444 PMID: 29698603 PMCID: PMC6190668

# Luzhansky, I.D., Schwartz, A.D., MacMunn, J.P., Cohen, J.D., Barney, L.E., Jansen, L.E., and Peyton, S.R.\*, (2018) “Anomalously diffusing and persistently migrating cells in 2D and 3D culture environments” *APL Bioengineering* doi: 10.1063/1.5019196 PMID: 31069309 PMCID: PMC6324209

# Schwartz, A.D., Hall, C.L., Barney, L.E., Babbitt, C.C., and Peyton, S.R.\*, (2018) “Mechanosensing of Integrin 6 and EGFR Converges at Calpain 2” *Biomaterials* doi: 10.1016/j.biomaterials.2018.05.056 PMID: 30082272 PMCID: PMC6078165

# Lee, J.V., Berry, C.T., Kim, K., Sen, P., Kim, T., Carrer, A., Trefely, S., Zhao, S., Fernandez, S., Barney, L.E., Schwartz, A.D., Peyton, S.R., Snyder, N.W., Berger, S.L., Freedman, B.D., and Wellen, K.\*, (2018) “Acetyl-CoA promotes glioblastoma cell adhesion and migration through Ca2+–NFAT signaling”, *Genes and Development*, doi: 10.1101/gad.311027.117 PMID: 29674394 PMCID: PMC5959234

# Jansen, L.E., Negron-Pineiro, L., Galarza, S., Peyton, S.R.\* (2018) “Control of Thiol-Maleimide Reaction Kinetics in PEG Hydrogel Networks” *Acta Biomaterialia* doi: 10.1016/j.actbio.2018.01.043 PMID: 29452274 PMCID: PMC5871581

# Brooks, E.A., Jansen, L.E., Gencoglu, M.F., Yurkevicz, A.M., and Peyton, S.R.\* (2018) “Complementary, semiautomated methods for creating multidimensional PEG-based biomaterials” ACS Biomaterials Science and Engineering, doi: 10.1021/acsbiomaterials.7b00737 PMID: 33418758

# Gencoglu, M.F., Barney, L.E., Hall, C.L., Brooks, E.A., Schwartz, A.D., Corbett, D.C., Stevens, K.R., and Peyton, S.R.\* (2018) “Comparative Study of Multicellular Tumor Spheroid Formation Methods and Implications for Drug Screening” ACS Biomaterials Science and Engineering, **DOI:**10.1021/acsbiomaterials.7b00069 PMID: 29527571 PMCID: PMC5843470

# Tran, Y.H., Rasmuson, M.J., Emrick, T.S., Klier, J.\*, and Peyton, S.R.\* (2017) “Strain-stiffening gels based on latent crosslinking” *Soft Matter* DOI: 10.1039/C7SM01888F PMID: 29164222

# Schwartz., A.D., Barney, L.E., Jansen, L.E., Nguyen, T.V., Hall, C.L., Meyer, A.S., and Peyton, S.R.\* (2017) “A Biomaterial Screening Approach to Reveal Microenvironmental Mechanisms of Drug Resistance” *Integrative Biology*. doi: 10.1039/C7IB00128B PMID: 29159332 PMCID: PMC5725273

1. Galarza, S., Perry, S.L., and Peyton, S.R.\* (2017) "A Student-Created, Open Access, Living Textbook" *Chemical Engineering Education* (51) 1.
2. Wilder, C.L., Walton, C., Watson, V., Stewart, F.A.A., Johnson, J., Peyton, S.R., Payne., C.K., Odero-Marah, V., Platt, M.O.\* (2016) "Differential cathepsin responses to inhibitor-induced feedback: E-64 and cystatin C elevate active cathepsin S and suppress active cathepsin L in breast cancer cells" *The International Journal of Biochemistry & Cell Biology.* DOI: 10.1016/j.biocel.2016.08.030 PMID: 27592448 PMCID: PMC5067213
3. Yoshii, T., Geng, Y., Peyton, S.R.\*, Mercurio, A.M.\*, Rotello, V.M.\* (2016), “Biochemical and biomechanical drivers of cancer cell metastasis, drug response and nanomedicine” *Drug Discovery Today*. DOI: 10.1016/j.drudis.2016.05.011.
4. Barney, L.E., Jansen, L.E., Galarza, S., Polio, S.R., Lynch, M.E., and Peyton, S.R.\* (2016), “The predictive link between matrix and metastasis” *Current Opinion in Chemical Engineering*. PMID: 26942108 PMCID: PMC4770819
5. Jansen, L.E., Birch, N.P., Schiffman, J.D., Crosby, A.J., and Peyton, S.R.\* (2015) “Mechanics of intact bone marrow” *Journal of the Mechanical Behavior of Biomedical Materials*, 50:299-307, DOI:10.1016/j.jmbbm.2015.06.023 PMID: 26189198 PMCID: PMC4554886
6. Kolewe, K.W., Peyton, S.R., and Schiffman, J.D.\* (2015) “Fewer bacteria adhere to softer hydrogels” *ACS Applied Materials and Interfaces*. 9;7(35):19562-9. DOI: 10.1021/acsami.5b04269 PMID: 26291308 PMCID: PMC4631609
7. Herrick, W.G., Rattan, S., Nguyen, T.V., Grunwald, M.S., Barney, C.W., Crosby, A.J., and Peyton, S.R.\* (2015) “Smooth muscle stiffness sensitivity is driven by soluble and insoluble ECM chemistry” *Cellular and Molecular Bioengineering*, DOI: 10.1007/s12195-015-0397-4 PMID: 26495043 PMCID: PMC4610395
8. Birch, N.P., Barney, L.E., Pandres, E., Peyton, S.R., and Schiffman, J.D.\* (2015) “Thermal-responsive behavior of a cell compatible chitosan:pectin hydrogel” *Biomacromolecules*, 16(6):1837-1843, DOI: 10.1021/acs.biomac.5b00425 PMID: 25932898 PMCID: PMC4943228
9. Barney, L.E., Dandley, E.C., Jansen, L.E., Reich, N.G., Mercurio, A.M., and Peyton, S.R.\* (2015) “A cell-ECM screening method to predict breast cancer metastasis” *Integrative Biology*, 7:198-212, DOI: 10.1039/C4IB00218K PMID: 25537447 PMCID: PMC4323858
10. Nguyen, T.V., Sleiman, M., Moriarty, T. Herrick, W.G, and Peyton, S.R.\* (2014) “Sorafenib resistance and JNK signaling in carcinoma during extracellular matrix stiffening” *Biomaterials*, 35(22):5749-5759, DOI: 10.1016/j.biomaterials.2014.03.058 PMID: 24726537
11. Page, S.M., Parelkar, S., Gerasimenko, A., Shin, D.Y., Peyton, S.R., and Emrick, T.S.\* (2014) “Promoting cell adhesion on slippery phosphorylcholine hydrogel surfaces” *Journal of Materials Chemistry B*, 2(6):620-624, DOI: 10.1039/C3TB21493A PMID: 32261278
12. Minsky, B., Nguyen, T.V., Peyton, S.R., Kaltashov, I., and Dubin, P.\* (2013) “A heparin decamer bridges a growth factor and an oligolysine by different charge-driven interactions” *Biomacromolecules*, 14(11):4091-98, DOI: 10.1021/bm401227p PMID: 24107074
13. Herrick, W.G, Nguyen, T.V., Sleiman, M., McRae, S., Emrick, T.S. and Peyton, S.R.\* (2013) “PEG-Phosphorylcholine hydrogels as tunable and versatile platforms for mechanobiology” *Biomacromolecules*, 14(7):2294-2304, DOI: 10.1021/bm400418g PMID: 23738528
14. Kim, H-D. and Peyton, S.R. (2012) “Bio-inspired materials for parsing matrix physicochemical control of cell migration” *Integrative Biology,* Jan;4(1):37-52, DOI: 10.1039/C1IB00069A PMID: 22025169

**Before Arrival at UMass**

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3. Kim, P.D., Peyton, S.R., VanStrien, A.J., and Putnam, A.J.\* (2009) “The influence of ascorbic acid, TGF-β1, and cell-mediated remodeling on the bulk mechanical properties of 3-D PEG-fibrinogen constructs” *Biomaterials*, Aug;30(23-24):3854-64, DOI: 10.1016/j.biomaterials.2009.04.013 PMID: 19443026
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5. Peyton, S.R., Kim, P.D., Ghajar, C.M., Seliktar, D., and Putnam, A.J.\* (2008) “The effects of matrix stiffness and RhoA on the phenotypic plasticity of smooth muscle cells in a 3-D biosynthetic hydrogel system” *Biomaterials*, Jun;29(17):2597-607, DOI: 10.1016/j.biomaterials.2008.02.005 PMID: 18342366 PMCID: PMC2855209
6. Khatiwala C.B., Peyton, S.R., and Putnam, A.J.\* (2007) “The regulation of osteogenesis by ECM rigidity in MC3T3-E1 cells requires MAPK activation,” *Journal of Cellular Physiology*, 211: 661-672, DOI: 10.1002/jcp.20974 PMID: 17348033
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10. Khatiwala C.B., Peyton, S.R., and Putnam, A.J.\* (2006) “The effects of the intrinsic mechanical properties of the extracellular matrix on the behavior of pre-osteoblastic MC3T3-E1 cells” *AJP-Cell Physiology,* 290(6):C1640-50, DOI: 10.1152/ajpcell.00455.2005 PMID: 16407416
11. Peyton, S.R. and Putnam, A.J.\* (2005) “Extracellular matrix rigidity governs smooth muscle cell motility in a biphasic fashion” *Journal of Cellular Physiology*, 204(1):198-209, DOI: 10.1002/jcp.20274 PMID: 15669099

**BOOKS AND CHAPTERS**

1. Kim, H., Huber, R., Das Mahapatra, R., Tseng, N-H., and Peyton, S.R., (2021) Tumor dormancy and relapse regulated by the extracellular matrix. Included in Book: Cancer metastasis through the lymphovascular system. Springer.
2. Peyton, S.R., Gencoglu, M.F., Galarza, S., and Schwartz, A.D. (2018) Biomaterials in Mechano-oncology: Means to tune materials to study cancer. Included in Book: Biomechanics in Oncology, 253-287. Springer. DOI: 10.1007/978-3-319-95294-9\_13 PMID: 30368757
3. Oyen, M.L., Peyton, S.R., and Stein, G.E. (2012). Book editors. Biomimetic, Bio-inspired and Self-Assembled Materials for Engineered Surfaces and Applications. MRS Symposium Proceedings, Volume 1498, MRS Fall Meeting. Cambridge Press.

**PATENTS**

1. Crosslinkable polymer composition; Peyton, Klier, Tran, and Emrick. Patent number 10968369. Filed July 26th, 2018, awarded April 6th, 2021.
2. 3D synthetic tissue hydrogels; UMA 17-008/Lauren Jansen/UMass Amherst - SLW: 3724.031US1 U.S. Patent Application Serial No.: 15/895,710, filed February 13, 2018
3. Polymer composition and pressure sensitive adhesive; US62537130/Yen Tran/UMass Amherst filed July 2017

**SEMINARS AND INVITED OR KEYNOTE CONFERENCE PRESENTATIONS**

***Departmental Seminars, Invited and Keynote Talks***

2023

GRC Physical Sciences of Cancer, Invited Talk

Tufts University Biomedical Engineering

North Carolina State University Chemical Engineering

9th International Conference on Cancer Metastasis, Invited Talk

2022

University of Buffalo Chemical Engineering

Tufts University Chemical Engineering

West Virginia University Chemical Engineering

University of Delaware Biomedical Engineering

New York University Chemical Engineering

UNSW School of Chemistry

OzNano Med

Fred Hutchison Cancer Center

University of Washington Bioengineering

Northwestern University Chemical Engineering

2021

Cornell University Biomedical Engineering

University of Pennsylvania Bioengineering

LSU Chemical Engineering

EPFL Chemical Engineering

Vanderbilt Chemical Engineering

2019

Smith College

University of Cincinnati Chemistry

SelectBio (2)

Pennsylvania State University Bioengineering

UCLA Bioengineering

AACR Models of Tumor Dormancy

2018

UC Berkeley Bioengineering

Virginia Tech University BEAM

Purdue University Chemical Engineering (Mellichamp)

University of Pittsburgh School of Pharmacy

The Royal Society, London, UK

Nanotechnology in Medicine II

World preclinical congress: tumoroids in oncology

Cancer Evolution and Ecology: Theory and Clinical Practice

Huntsman Cancer Institute at the University of Utah

5th international conference on cellular and molecular bioengineering, Singapore

Inclusion of LGBTQ+ in STEM. NSF-funded workshop, Georgia Tech University

Biomaterials Day, Society for Biomaterials, University of Florida

Cellular and Molecular Bioengineering Conference

2017

West Michigan Regional Undergraduate Science Research Conference

Gordon Research Conference on Biomaterials and Tissue Engineering

US-Australia NCI-sponsored workshop

Van Andel Research Institute

Arizona State University Chemical Engineering

Keystone Conference on Cell Plasticity in the Tumor Microenvironment

2016

NanoGE CellMatrix Symposia, Berlin

University of Minnesota Chemical Engineering

Systems Approaches to Cancer Biology, Woods Hole

University of Virginia Biomedical Engineering

Physical Sciences in Oncology Network, NIH

IMCE conference, Kyushu University

2015

Notre Dame University Chemical and Biomolecular Engineering

University of Illinois Bioengineering

Rice University Bioengineering

University of Delaware Chemical and Biomolecular Engineering

Northwestern University Chemical and Biological Engineering

NEBEC Conference

City College of New York Biomedical Engineering Seminar

2014

Brown University Biomedical Engineering

Northeastern University Biomedical Engineering

University of Wisconsin, Madison Biomedical Engineering

Boston University Soft Matter Agora

World Congress of Biomechanics, Boston, MA

Gordon Research Conference on Signal Transduction in Engineered Extracellular Matrices

Georgia Tech University Biomedical Engineering

NEAGAP Science Days, University of Puerto Rico, Mayaguez.

University of Massachusetts Medical School, Molecular Medicine Program

2013

Breast Cancer Research Symposia, University of Massachusetts Medical School

Gordon Conference on Signal Transduction in Engineered Matrices

2012

2ndConference on Cellular and Molecular Bioengineering

2011

Predictive Functional Human Tissue Models Conference, Hosted by the Cambridge HealthTech Institute

Pioneer Valley Life Sciences Institute

Young Investigators in Materials Research, Hosted by the NSF MRSEC at the University of Massachusetts Amherst.

**RESEARCH SUPPORT**

\*For simplicity, all funding below is “Total funding” (direct + indirect cost, when applicable)

1. WellcomeLeap, R3-2021-3327974764, A flow transcription device for high purity / low-cost mRNA manufacturing. PI: Martin (Co-PIs Perry and Peyton). $1,613,557. 1/1/22-12/31/24.
2. National Institutes of Health, 1U01CA265709-01, Personalization and Failure Testing of Dual Switch Gene Drives in Lung Cancer. PI: Pritchard (Co-Is Peyton and Lee). $2,312,095. 9/10/21-8/31/26.
3. National Science Foundation, REU Site: MURALS (Materials-focused Undergraduate Research Applied to the Life Sciences) at UMass Amherst. DMR-2150075. PI: Peyton. $391,761. 4/1/22-3/31/25.
4. National Science Foundation, Cryptic Hydrogels. PI: Peyton. $594,117. 7/1/19-6/30/24.
5. Army Research Offices Contract, W911NF1910388 Force-Activated, Mechanically Adaptive Soft Materials: Harnessing Cryptic Bonds in Synthetic Systems. PI Peyton (Co-PIs Klier, Emrick, and Balazs (UPitt). $657,303. 7/26/19-7/25/22.
6. National Institutes of Health PREP (R25). PI Peyton, Co-Is: Thompson and Richardson. $2,130,564. 3/1/2019-2/29/2024.
7. National Institutes of Health, T32 Training Grant. MPIs Hardy and Peyton. $704,224. 7/1/2020-6/30/2025.
8. Jayne Koskinas Ted Giovanis Foundation for Health and Policy, Foundation Grant: Eradicating metastatic breast cancer cells by overcoming their tissue-specific drug responses. PI: Peyton, Co-Is Lee and Pritchard. $438,000. 9/1/20-8/31/23.
9. National Science Foundation REU Supplement (BMAT). PI: Peyton. $6,000. 6/1/23-9/1/23.
10. National Institutes of Health, Diversity Supplement for U01CA265709. Awarded to support Adrian Lorenzana and Anna Wirasaputra in Peyton lab. PI: Peyton. $486,746. 9/1/23-8/30/26.

***Completed Research Funding***

1. Armstrong Professorship awarded to Peyton. Approximately $300,000 total to Peyton lab. 7/1/20-6/30/23.
2. National Science Foundation REU Supplement (BMAT). PI: Peyton. $12,000. 6/1/22-9/1/22.
3. National Science Foundation, CAREER: Mechanisms of Drug Resistance in a Responsive Biomaterial Platform. PI: Peyton. $500,160. 7/1/15-6/30/20.
4. Office of Naval Research, Multi-PIs Crosby, Lee, Peyton, Tew, Cai, and Riggleman. $2,650,000. 1/2/2017-1/1/2021.
5. Manning Award, UMass. PI: Peyton. $100,000. 1/1/20-12/31/20
6. National Institutes of Health, R21 Award. PI: Peyton. $322,118. 7/1/18-6/30/20.
7. AMIGOS grant, co-funded by the JKTG foundation and BCRF. Multi-PIs Heiser, Meyer, Peyton, Nie, and Levy). $450,000. 1/2/2017-1/1/2020.
8. AMIGOS grant, co-funded by the JKTG foundation and BCRF. Multi-PIs Ewald, Newton, Macklin, Peyton, and Bader). $450,000. 1/2/2017-1/1/2020.
9. National Institutes of Health, R21 Award. Multi-PIs Hayward and Peyton. $438,626. 9/1/16-8/31/18.
10. National Institutes of Health, New Innovator Award. *Tissue-specific stem cells and breast cancer tissue tropism*. PI: Peyton. $2,385,000. 9/30/13-6/30/18.
11. National Institutes of Health, Diversity Supplement for New Innovator Award. Awarded to support Sualyneth Galarza in Peyton lab. PI: Peyton. $230,286. 7/1/15-6/30/18.
12. Barry and Afsaneh Siadat, Early Career Award (Private Donors). PI: Peyton. $150,000. 2012-17.
13. Pew Charitable Trusts, Research Scholar Award. *Tissue-specific stem cells and breast cancer tissue tropism in bioengineered microenvironments.* PI: Peyton. $240,000. 8/1/13-7/31/18.
14. UMass President’s Office Science and Technology Initiatives Fund. Integrating Physical Sciences and Oncology. PI: Rotello and Mercurio. $134,000. 7/1/15-6/30/17.
15. Armstrong Fund for Science, University of Massachusetts, Amherst. *Nanomechanics, Biofilms, and Cystic Fibrosis.* PI: Schiffman. $30,000. 8/1/14-7/31/16.
16. National Science Foundation REU Supplement (BMAT). PI: Peyton. $9,000. 6/1/14-9/1/14.
17. National Science Foundation REU Supplement (BMAT). PI: Peyton. $4,000. 6/1/15-9/1/15.
18. National Science Foundation Conference funding (BMAT for MRS Fall 2013 Meeting). PI: Peyton (sponsored by MRS). $4,000. November 2013.
19. American Heart Association, Grant-in-Aid. *Smooth Muscle Stiffness Sensing in Atherosclerosis*. PI: Peyton. $198,000. 7/1/13-6/30/16.
20. National Science Foundation and National Cancer Institute, PESO Special Call: Materials and Multivariable Models to Predict Tissue Tropism in Metastasis. Co-Funded from NCI and NSF (BMAT, CBET, and CMMI). PI: Peyton. $590,000. Co-PI: Reich. 9/1/12-8/31/15.
21. National Science Foundation, MRSEC Seed Award. PI: Peyton. $65,000 in funding for Peyton Laboratory. 2012-14.
22. National Science Foundation, MRSEC on Polymers. PI: Emrick. Funding for Peyton Laboratory 2011: $15,000; 2015: $40,000.

**TEACHING**

***Undergraduate Courses Taught***

**ChemEng 290B**: Experimental Methods in Chemical Engineering. Fall 2018-present. I designed course, details in Teaching Statement available upon request.

**ChemEng 220** (renumbered from ChemEng 290B): Chemical Engineering Principles of Biological Systems. Fall 2011-17. I designed course, details in Teaching Statement available upon request.

**ChemEng 575** (renumbered from ChemEng 590B): Tissue Engineering. Spring 2012-17.

I designed course, details in Teaching Statement available upon request.

***Graduate Courses Taught***

**ChemEng 610** (renumbered from ChemEng 690A): Fundamentals of Intelligent Theses. Spring 2018-present.

I designed course, details in Teaching Statement available upon request.

I have also taught summer modules, workshops, journal clubs, and supervised many teaching assistants. Details available upon request.

***Current PhD Advisees***

Ninette Irakoze (Chemical Engineering). *Drug resistant metastatic breast cancer*. Expected completion 2026.

Akaansha Rampal (Molecular and Cell Biology). Co-advised with Richard Vachet. *Mass-spectrometry imaging of networks and tissues*. Expected completion: 2024.

Adrian Lorenzana (Chemical Engineering). Co-advised with John Klier *Mechanosensitive polymers and gels*. Expected completion 2024.

Rebecca Huber (Chemical Engineering). *Astrocyte activation in hydrogels*. Expected completion 2024.

Anna Wirasaputra (Chemical Engineering). *Tumor dormancy*. Expected completion: 2027.

***Current MS Advisees***

Alexi Panagiotou (Biochemistry and Molecular Biology). Breast to brain metastasis. Expected completion: 2023.

***Post-doctoral Advisees and other Professional Staff***

Nathan Richbourg, PhD (Post-doc, Chemical Engineering PhD from UT-Austin). *Drug resistant metastatic breast cancer.*

***PhD Student Alumni***

Hyuna Kim (Molecular and Cell Biology). *Mechanisms of breast cancer drug resistance*. August 2023

Carey Dougan (Chemical Engineering). *Brain Mechanics and TBI*. August 2023

Katie Bittner, MD (Molecular and Cell Biology). *Vascularizing Tumor Models.* August 2023.

Aritra Nath Kundu (Chemical Engineering). *Tenascin-C in Breast to Lung Metastasis.* October 2022.

Ning-Hsuan Tseng (Molecular and Cell Biology). *Tumor Evolution.* May 2022

Yen Tran (Chemical Engineering). *Cryptic Materials.* December 2019.

Inha Baek (Chemical Engineering) *Breast cancer dormancy*. Joined lab in November of 2018, left lab before completion of degree in summer of 2019.

Sualyneth Galarza (Chemical Engineering). *In vitro Models of Breast to Brain Metastasis.* June 2019

Elizabeth Brooks (Chemical Engineering). *Drug resistance in breast cancer*. December 2018

Alyssa Schwartz (Chemical Engineering). *Rapid screening systems to predict cancer spread and drug response.* September 2018

Lauren Jansen (Chemical Engineering). *Breast cancer metastasis to bone marrow in model systems*August 2017

Lauren Barney (Chemical Engineering). *Engineered microenvironments to study tissue tropism in metastatic breast cancer.* September 2016

**Thuy Nguyen (Chemical Engineering).** *Using high throughput technologies to study
drug resistance in carcinoma*. December 2015.

**William Herrick (Chemical Engineering).** *Smooth muscle cell stiffness sensing in atherosclerosis*. October 2014.

***Former Post-doctoral Scholars and other Professional Staff***

Sonu Kizhakkepura, PhD (Post-doc, Chemistry PhD from JNCASR India). *Cryptic Hydrogels*

Christopher Hall, PhD (Research Assistant Professor, Cancer Biology PhD from UT-Houston Health Science Center). *Prostate cancer dormancy*

Sam Polio, PhD (Post-doc, Biomedical Engineering PhD from Boston University). *Breast to Lung Metastasis.* 2014-16.

Maria Gencoglu, PhD (Post-doc, Chemical Engineering PhD from Michigan Tech University). *Biomaterial systems to screen ovarian cancer drug resistance.*

Carey Dougan, BS (Lab Manager/Technician, Chemical Engineering BS from University of Arkansas). *Tissue Mechanics.*

Rita Das Mahapatra PhD (Post-doc, Chemistry PhD from IIT Kharagpur). *Hydrogel start-up company*

***MS Student Alumni***

Bakthavachalam Kannadasan (Chemical Engineering). *3D Printing of Soft Materials*. June 2023

Yinghong (Lily) Liu (Chemical Engineering). Co-advised with John Klier. *Ultrasound-activated networks*. July 2021.

Igor Luzhansky (Chemical Engineering). *Drug resistance and dormancy in bone marrow*. September 2016.

**Dannielle Ryman (Molecular and Cellular Biology).** *Using patterned polymer microlenses to study stiffness sensing in metastatic breast cancer cells*. August 2013.

Marcos Manangare (Molecular and Cellular Biology). *Cell-stiffening synthetic hydrogels for cardiovascular applications.*  July 2015.

***Former Post-bach/PREP students***

Lenny Negrón-Piñeiro (PREP student). *Cancer metastasis and drug resistance.* 2015-16.

Jamiu Giwa-Otusajo (PREP student). *Cathepsin hydrogels*. 2017-18.

Nathan Colon (PREP student). *Mechanical properties of hydrogels.* 2011-12

***Former Undergraduate Researchers (worked as research assistants in Peyton lab)***

Undergrads have gone on to PhD programs (NC State, Penn, UCSB, Berkeley) and lucrative industry jobs in the biotech/pharmaceuticals arena. \*denotes peer-reviewed publication while in Peyton lab. # denotes member of honors college.

Jaclyn Somadelis# 2011-12

Erinn Dandley\* 2011-12

Tyler Vlass# 2011-12

Prateek Katti# 2011-12

Maxsimillyan Nowack# 2011-13

Jonathan Chiang 2011-12

Venkata Yelleswarapu 2011

Elyse Hartnet 2012-13

Danielle LaValley 2012

Chaz Cuckler 2012

Aidan Gilchrist# 2012-13

Isaac Han 2012-13

Matthew Crotty 2012-13

Patrick Colleton 2012-13

Peggy Yuen 2013

Robert Gunther 2013

David Gallagher 2013

Jason Awerman 2014

Nicholas Koenig 2014

Timothy Moriarty\* 2012-13

Marianne Sleiman\*\*# 2012-15

Justine Jesse# 2012-15

Mariusz Rdutokoski# 2012-15

Michel Grunwald\* 2014-15

Megan Renny 2014

Elizabeth Swanson 2014

Cierra Cotton 2014

Shayna Nolan 2013-15

Thomas McCarthy 2014-16

John MacMunn\* 2014-16

Michael Fitman 2014-15

Ari Gilman 2014-16

Luka Catipovic 2015

Marisa Souza 2017

Adam Selsman 2015-2018

Chris Sparages\* 2015-2018

Annali Yurkevicz 2015-2018

Dave Podorefsky 2015-2018

Matt Rasmuson 2015-2018

Jessica Belliveau 2015-2018

Ian Kilcoyne 2016-2018

Sarah Duquette# 2016-2019

Eric Blanchard 2016-2019

Samantha Downs 2018-2019

Allie Triozzi 2018-2019

Jacob Ong 2017-2020

Bryan Kennedy 2018-2020

Jenna Elsner 2018-2020 Samuel Tipps# 2019-2021

Maxwell Hayward 2020-2021

Sean Corriveau 2020-2021 Jennifer Esteves\* 2020-2022

Alara Kilic 2020-2022

Diana Barr 2021-2023

Gary Ren 2021-2022

Annabelle Hendrickson 2022

Arshiyan Alam Laaj 2022

Alexi Panagiotou 2022-2023

Sage Seymour# 2022-2023

Shreya Manikandan 2023

Sujin Cha 2022-2023

Cam Lobik 2023

***Current Undergraduate Researchers***

Benjamin Pepper 2022-

Dimitraq Nikolla 2022-

Cole Haag 2023-

Hsu Shwe Yee Naing# \* 2023-

Mahidhar Lakkavaram 2022-

Dora Eng-Wu 2023-

Narine Berberian 2023-

***Summer Undergraduate Students Supervised as REU Site Director***

From 2022 – 2024, I was PI and director of the REU Site at UMass Amherst: MURALS (Materials-focused Undergraduate Research Applied to the Life Sciences). Each summer we hosted 10 students for 10 weeks on campus and placed them in labs in Chemical Engineering, Biomedical Engineering, Civil and Environmental Engineering, and Chemistry. Students hosted:

Malik Harry

Ezekiel Eliamani

Loria DiMartino

Roxana Chavez

Ryan Westervelt

Carolina Iribarren

Larissa Gomes

Emi Marshall

Annika Oberdorfer

Ishmael Adibuah

Ashley Davis

Anthony Dee

Noah Flores

Mayayi Izzo

Kahlil Johny

Stephanie Martinez

Chanelle Moise

Aaron-Emiliano Portillo

Marcus Vorpahl

***High school students (from NSF “Engineering the Cell” Program)***

As part of my NSF-NCI PESO grant (awarded in 2012), I initiated a 5-week summer program titled “Engineering the Cell: A Bioengineering Experience for Women”. This program gives $2500 to two high school female students, from underrepresented groups, typically underperforming in the classroom, to participate in summer research in the Peyton lab.

Participants: Valerie Gonzalez, Katherine Mora (2013); Maia Haiman, Christina Manson (2014); Kassie Frazier, Alexandria Triozzi (2015); Natalia Lopez, Mary-Catherine Whalen (2016); Jacqueline Seddon, Amayia Lanuesse (2017); Amanda Dee, Danielle Beason (2018); Catherine Paredes-Amaya, Kamilla Jules, Elizabeth Jimenez Bueno, Ezeobodo Ononibaku (2019); Fatma Abdel-Maksoud, Nandi Chivende, Sianah Anderson-Haley, Zenani Himlin-Mayekiso (2021); Addison Lepak, Genevieve Lagrant, and Reese Haag (2022)

**SERVICE**

**Leadership**

**Departmental:** My most significant contribution to department service was serving as Graduate Program Director from 2016-2022. My notable contributions here have been increasing the diversity of our graduate student body and initiating a new MS thesis degree program for the department. I have also served on or led many committees across the department that give me experience with nearly all aspects of department roles and responsibilities, including interaction with the alumni advisory board and fundraising, the Departmental Personnel Committee, the undergraduate program committee, seminar coordinator, and have either chaired or served on several faculty search committees. Another notable experience was during the 2012-13 academic year, I helped draft our department by-laws. Our charge was to draft a set of by-laws for the department concerning personnel actions, hiring, department head review, and legislating faculty voting issues. My experience hiring personnel and establishing departmental by-laws make me uniquely positioned to become a Center Director.

**University Wide:** UMass-wide, I served as co-director of the Models 2 Medicine Center for the Institute of Applied Life Sciences (IALS). In my directorship position, I managed our center’s budget, directed the center’s vision on research strategies and collaborative opportunities, coordinated with our core facilities director, managed space in the Life Sciences Laboratories where IALS is hired (approximately 60 faculty and 10 staff members), and worked with the industrial advisory board to set longer-range strategic plans. This center-level leadership experience supplements my departmental leadership to again, well-position me to become a Center Director at NCI. As stated in other documents, I am MPI on the NIH T32 training grant on Biotechnology, and I am lead PI on the UMass PREP program. For the UMass community I have served on or chaired several important hiring committees relevant to leading a new Center: notably the College of Engineering Dean search committee 2019, BME Head search committee co-chair 2017, Graduate School Dean search committee 2020, the director for the IALS search committee in 2014, and the Chancellor-Appointed University task force on sexual harassment (2019-20).

***Journal Editorial Service***

Associate Editor, Science Advances 2022-present

Editorial Board, Cytoskeleton, 2019-2023

***Grant review***

NIH BTSS Standing Study Section Member, July 2017-2022

NCI Special Emphasis Panels (*ad hoc*, several)

NSF (*ad hoc*, several) BBBE, BMAT, and GRFP

American Heart Association, Bioengineering (*ad hoc*, several)

***National Organizations, Conference Organization***

***BMES***

I served as meeting chair for the BMES annual meeting in 2021 with co-chair Manu Platt.

***AIChE***

I currently serve as Long Range Programming Chair for AIChE Division 15 from 2023-2027. I led 15D/E for the AIChE annual meeting in 2016, I was elected as 1 of 2 Materials Engineering and Sciences Division (MESD) directors of AIChE for 2015-17 (two year term), and was elected as programming chair for AIChE division 15 (2019-2020).

***GRC***

Chair of the GRC meeting on Signal Transduction in Extracellular Matrices (STEEM) in 2024 with co-chair Sanjay Kumar (UC Berkeley).

***Departmental***

Activities at UMass: My most significant contribution to department service has been serving as Graduate Program Director since 2016. My notable contributions here have been increasing the diversity of our graduate student body, and initiating a new MS thesis degree program for the department (some excellent guidelines provided by Prof. Jeff Davis). I have also served on the DPC (x4), and have either chaired or served on several faculty search committees. UMass-wide, I am co-director of the Models 2 Medicine Center for the Institute of Applied Life Sciences (with Peter Chien and Jeanne Hardy), co-PI on the NIH T32 training grant on Biotechnology (PI Jeanne Hardy), co-PI on the UMass PREP program (co-PIs Sandy Petersen and Lynmarie Thompson), and have served on several committees: notably the Engineering Dean search committee 2019, BME Head search committee co-chair 2017, Graduate School Dean search committee 2020, and the Chancellor-Appointed University task force on sexual harassment (2019-20).

Seminar Coordinator. I served as the seminar coordinator for the Chemical Engineering department, from 2012-15. This position includes soliciting names from colleagues, inviting faculty to visit our department, and ensuring proper scheduling of visits.

Undergraduate Academic Advising. In Chemical Engineering at UMass I typically advise 20-25 undergraduates, meeting with them at least twice per year. With a few of them I meet more often, to help them with curriculum planning and discuss their summer REU or internship applications. I have also participated several times in summer student advising for the College of Engineering.

Undergraduate Program Committee Member. I served as a member of the undergraduate program committee, from 2012-14.

Graduate Program Committee Member. I served as a member of the graduate program committee, from 2014-15. This committee met approximately monthly, discussing TA assignments, curriculum requirements, admissions, and the qualifying examination.

Graduate Admissions Director. I was director of graduate admissions for two years, organizing, recruiting, and admitting graduate students for the incoming class. In 2015, this job included the review of 261 applicants, working with other faculty members to help with the review, and recommending 35 students for admittance into the PhD program. This service assignment also includes organizing the graduate recruiting weekend in March.

Member of By-Laws Committee. During the 2012-13 academic year, I was a member of the by-laws committee for the department. Our charge was to draft a set of by-laws for the department concerning personnel actions, hiring, department head review, etc. We met approximately bi-monthly, and drafted several documents together to help legislate faculty voting issues. Other members of the committee were Neil Forbes (chair), Susan Roberts, Mike Henson, Curt Conner, and Paul Dauenhauer.

Chemical Engineering Senior Seminar Speaker. Nearly every year I give an approximately 50 minute lecture/discussion to the seniors on preparation for graduate school applications, the roles and responsibilities of being a PhD student, and career opportunities for PhD level chemical engineers.

“CRIB” Design Committee. I worked with Paul Dauenhauer, T.J. Mountziaris, and Amity Lee in the Chemical Engineering office to remodel a student study space for our chemical engineering undergraduates. This effort essentially doubled the amount of space our undergraduates have to study and work in groups, includes 2-3 person cubbies for small group work, has updated computers and software in all cubbies, and also contains a large group area with conference tables and a projector. It is an immensely popular study area for our students.

***College, University***

Engineering Search Committees.I have served on College of Engineering search committees in Mechanical Engineering and Biomedical Engineering.

IALS Director Search Committee. I served on the search committee to find a director for the IALS, the Institute for Applied Life Sciences in 2014.

MRSEC Internal Advisory Board. Appointed by Todd Emrick, I served as a member of the internal advisory board for the MRSEC. Duties include leading IRG efforts, preparing for MRSEC applications, and offering scientific input on the next directions of the UMass MRSEC.

Pew Biomedical Scholars Internal Review Committee. I have helped the office of research and development at UMass to select the internal nominees for the Pew biomedical scholars program.

Dissertation Committee Memberships:

Andreas Kourouklis, Chemical Engineering

Genevieve Abbruzzese, Molecular and Cell Biology

Jan Panteli, Chemical Engineering

Ngoc Le, Chemistry

Yujie Liu, Polymer Science and Engineering

Catera Wilder, Biomedical Engineering Georgia Tech University

Kris Kolowe, Chemical Engineering

Ryan Carpenter, Chemical Engineering

Vishnu Raman, Chemical Engineering

Jordan Elliott, Chemistry

Coralie Backlund, Polymer Science and Engineering

Uma Nudurupati, Chemistry

Laura Lanier, Polymer Science and Engineering

Qi Lu, Polymer Science and Engineering

Sarah Ward, Polymer Science and Engineering

Ziwen Jiang, Chemistry

Allison Sirois, Molecular and Cell Biology

Vishnu Raman, Chemical Engineering

Paige Liu (MS), Chemical Engineering

Whitney Blocher, Chemical Engineering

Boyuan Liu, Mechanical Engineering

Alexandria Wells, Molecular and Cell Biology

Andrew Shockey, Biomedical Engineering Georgia Tech University

Gerardo Narez, Biomedical Engineering

Peiran Zhu (MS), Mechanical Engineering

Natthapong Sueviriyapan, Chemical Engineering

Joshua Hall, Mechanical Engineering

Dipika Nandi, Veterinary and Animal Sciences

Yongkuk Park, Chemical Engineering

Autumn Mineo, Polymer Science and Engineering

Sydney Foster (MS), Chemical Engineering

Nathan Kuhlman, Molecular and Cell Biology

Yu-Lin (Cynthia) Wang, Polymer Science and Engineering

Autumn Mineo, Polymer Science and Engineering

Hoi Kwon (MS), Chemical Engineering

Tailynn McCarty, Biomedical Engineering

Jun-goo Kwak, Molecular and Cell Biology

ORP Committee Memberships:

Di Huang, Molecular and Cell Biology

Emily Tetrault, Molecular and Cell Biology

Heather Bisbee, Molecular and Cell Biology

Olivia Macrorie, Molecular and Cell Biology

Dilay Ayhan, Molecular and Cell Biology

Karthik Chandiran, Molecular and Cell Biology

***Journal Review Service***

**ACS Biomaterials Science and Engineering**

**Acta Biomaterialia**

**APL Bioengineering**

BMC Cancer

**Biomacromolecules**

**Biomaterials**

**Biophysical Journal**

**Biotechnology and Bioengineering**

**Cell Adhesion and Migration**

**Cellular and Molecular Bioengineering**

**Integrative Biology**

Interface Focus

**International Journal of Molecular Sciences**

**Journal of Biomaterials Science**

**Journal of Biomedical Materials Research**

**Journal of Cell Science**

Journal of Functional Biomaterials

**Journal of Materials Chemistry**

Journal of Materials Science

Journal of Polymer Science A

Journal of Visualized Experiments

**Langmuir**

Molecular Oncology

Nature

**PLoS One**

PNAS

**Rheologica Acta**

Science Advances

Soft Matter

**Tissue Engineering**

**DIVERSITY, EQUITY, AND INCLUSION**

A significant portion of my service to UMass and to the profession is focused on diversity, equity, and inclusion. I was graduate program director for Chemical Engineering here at UMass for six years, and as director, I implemented new measures to increase the diversity and sense of belonging in our program. I founded and was chair of the Diversity, Equity, and Inclusion committee for both the Department of Chemical Engineering and the BTP (NIH T32 Biotechnology) training program until I left for sabbatical in the spring of 2021. Every fall, I lead recruiting efforts to three minority-serving conferences for STEM students at UMass. I am PI on the NIH PREP (Postbaccalaureate Research Education Program, R25) program at UMass, which brings students from historically excluded groups to UMass for research-intensive preparation for PhD programs in the biomedical sciences. I am most proud of the high school program I started at UMass in 2013 (titled: Engineering the Cell), which hosts 2-7 female high school students from historically excluded groups every summer in my lab to do bioengineering-related research with my lab. For the profession, I have served on the diversity committee for BMES, and I co-founded the LGBTQIA+ BMES social that is now held and sponsored every year at the national meeting. As co-chair of the national BMES meeting in 2021, Manu Platt and I ensured that diversity, equity, and inclusion topics, both scientific and as community building networking events, were continuously held and centered throughout the meeting.

Increasing diversity in the graduate program:

Our graduate program, as of the summer of 2014, consisted of 55 PhD students, 19 of whom were women, with zero students from underrepresented groups. The department has done an excellent job increasing the number of female graduate students, but we have historically struggled with targeted, department-wide efforts to increase the diversity of our graduate program along other axes. My focus as Graduate Program Director in Chemical Engineering has been to engage women and students from underrepresented minority (URM) groups into the department. I have helped lead a department-wide effort to increase recruitment and retention of students from URM groups to the department with proactive DEI strategies (detailed below and summarized here: https://che.umass.edu/che-diversity-equity-inclusion). The proportion of students from URM groups in our program has continued to grow since I became GPD.

Second, I am MPI with Jeanne Hardy on the Biotechnology (BTP) NIH T32 program. I am the chair of the DEI committee for this program, and my major efforts here have been to lead he outreach to URM conferences (SACNAS, NoBCChE, and ABRCMS). I have also been attending the weekly IDGP DEI meetings run by Pat Wadsworth as a representative of the IDGP community from the College of Engineering, but also as a representative of both BTP and CBI (the other NIH T32 program run by Lynmarie Thompson).

Third, I am a PI of the PREP program at UMass, which brings students from URM groups to UMass for a 1-year post-BS study to help prepare them for graduate school.

Fourth, I founded and was appointed as chair of the DEI committee for the Chemical Engineering Department. My appointment is in response to the fact that I initiated regular meetings for our department on social justice issues in response to the murders of George Floyd, Breonna Taylor, and countless others by the police in recent years. Our department did have a DEI website, but it consisted of relatively vague statements rather than the specific action items we are taking to address DEI. I called for all faculty members interested to join in DEI discussions, starting on June 24th, 2020. We met every Friday from 3-4pm, through August 14th, 2020. At that point, we had agreed on our first ten action items that we submitted to the College of Engineering, and these are now published on our departments DEI website alongside recent data related to DEI (similar to Figure 1). I worked with the Interim Department Head (Mike Henson) to name the rest of the official DEI committee, to continue our work. Our most immediate action items were to complete a DEI mission statement (10 action items, listed in detail here: https://che.umass.edu/che-diversity-equity-inclusion), with several more to come in the following few months.

Conference Leadership:

**SACNAS:** Alongside Drs. Madeleine Bartlett (Biology) and Sibongile Mafu (Biochemistry), I am running a special session at the SACNAS (Society for Advancement of Chicanos/Hispanics and Native Americans in Science) national conference in the fall of 2020 on mentoring (virtual due to COVID-19). We have recruited several post-docs, industry professionals, and young faculty members to speak at our special session panel to talk about mentorship (being a great mentor, finding mentors, and networking) - with a focus on women from underrepresented groups in STEM.

**BMES:** At the Biomedical Engineering Society (BMES) national meeting, I have organized and spoken at special sessions on DEI topics over the last two years. These special sessions were on Women’s Health and Global Health Approaches and Technologies in 2019 and 2020. In 2021, I ran the full conference with my co-organizer Manu Platt (Georgia Tech). We worked with the BMES board of directors to transition these two DEI-related special session topics to permanent scientific tracks for the meeting.

**LGBTQIA+ Advocacy at National Societies:** I have been an advocate, particularly in the BMES society, for LGBTQIA+ persons and issues for several years. I joined the Diversity Committee in BMES in 2014, and that year, alongside Naomi Chesler (Wisconsin) started the LGBTQIA+ and Friends dessert social at the national meeting. This has been immensely successful, with prominent speakers at the event every year. The BMES Diversity committee did a nice write-up/video of this event earlier this year as part of Pride month, found here: https://www.youtube.com/watch?v=e6hNaw0-TJA&feature=youtu.be. I have more recently become involved with LGBTQIA+ events at the Chemical Engineers national society (AIChE), and they recently did a small write-up of me as well: <https://www.aiche.org/chenected/2020/06/shelly-peyton-featured-lgbtq-cheme-professional>.

**National Leadership, BME UNITE:** I am one of the current executive members (alongside Kelly Stevens, University of Washington; Erika Moore, University of Maryland; and Audrey Bowden, Vanderbilt University) of BME UNITE (bmeunite.org, Underrepresented Needs In Technology & Engineering), a grassroots organization of 450+ faculty in the country working on developing anti-racism strategies in the academy. This group communicates over slack, meets ~5 times per year, and has published several articles in high profile journals on diversifying hiring, funding Black scientists, accountability in departments, and more. As part of the executive team, I help coordinate and run these meetings and help organize groups of people to work on these topics and more.

Increasing diversity of the engineering pipeline:

Starting in the summer of 2013, I used funding from my first NSF grant to form an educational outreach program titled: “**Engineering the Cell: A Bioengineering Experience for Young Women**.” This program brings female high school students from URM groups to my lab to do bioengineering research and what is necessary to be a successful bioengineer. Projects are integrated within my lab and include using common techniques to ask questions about how cells respond to physical and chemical stimuli. More importantly, students learn how to use the scientific method, how to plan and run a successful experiment, and work with a diverse group of people.

I provide students with a stipend of $2500 for their participation in the program that runs five days per week for five weeks. I provide a stipend so that students from areas of economic need will be able to participate, instead of having to find a summer job. Students apply with a short essay and a recommendation from a teacher. I choose students that specifically are not the highest performers in the classroom, but, rather, those whom the teacher feels will most benefit. My goal is to grow their confidence, demonstrating that science, math, and engineering are attainable career goals for such students. Successful implementation, growth, and longevity of this program will be one mechanism by which UMass can encourage more participation of women in bioengineering and related fields. This program is guaranteed to continue through at least 2023, as I have earned funding from my NSF CAREER grant and a more recent NSF grant on hydrogels to continue this program. I started partnering with The Collaborative in Northampton, MA to increase the number of students I could fund – bringing the size of the program to six in 2019 and growing ever since.