

# Adam Jeffrey Engler, PhD

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## ACADEMIC APPOINTMENTS AND AFFILIATIONS

### **University of California, San Diego; La Jolla, CA**

<i>Professor</i> , Department of Bioengineering	2018 – present
<i>Vice Chair</i> , Department of Bioengineering	2018 – present
<i>Associate Director</i> , Medical-Scientist Training Program	2018 – present
<i>Member</i> , UCSD Moores Cancer Center	2016 – present
<i>Associate Professor</i> , Department of Bioengineering	2014 – 2018
<i>Resident Scientist</i> , Sanford Consortium for Regenerative Medicine	2012 – present
<i>Member</i> , Material Science Graduate Program	2009 – present
<i>Member</i> , Biomedical Sciences Graduate Program	2009 – present
<i>Member</i> , UCSD Stem Cell Institute	2009 – present
<i>Member</i> , UCSD Glycobiology Research and Training Center	2009 – present
<i>Assistant Professor</i> , Department of Bioengineering	2008 – 2014

## EDUCATION AND RESEARCH TRAINING

Postdoctoral	<b>Princeton University</b> ; Princeton, NJ	2006 - 2008
Fellowship	Dept. of Molecular Biology Research Area: Fibronectin's influence on embryonic stem cells and cell adhesion Advisor: Jean E. Schwarzbauer, Ph.D.	
Ph.D.	<b>University of Pennsylvania</b> ; Philadelphia, PA Biophysical Engineering Lab Dissertation Title: <i>Mechanochemical Signaling Directs Cell State: A Mechanics of Materials Foundation for Cell Biology</i> Advisor: Dennis E. Discher, Ph.D.	2006
B.S.E.	<b>University of Pennsylvania</b> ; Philadelphia, PA Major: Bioengineering      Minor: Mathematics	2002

## HONORS AND FELLOWSHIPS

- Curtis W. McGraw Research Award, American Society for Engineering Education Engineering Research Council (2018)
- Fellow, American Institute of Medical and Biological Engineering (2018)
- Frontiers of Engineering Symposium Attendee, National Academy of Engineering (2015)
- Y.C. Fung Young Investigator Award, American Society for Mechanical Engineering (2015)
- Renato Iozzo Mid-career Award, American Society for Matrix Biology (2014)
- Breast Cancer IDEA Award, US Dept. of Defense (2013)
- Young Investigator Award, Human Frontiers Science Program (2010)
- New Innovator Award, National Institutes of Health (2009)
- Rita Schaffer Young Investigator Award, Biomedical Engineering Society (2008)
- Rupert Timpl Award, International Society for Matrix Biology (2008)
- National Research Service Award, National Cancer Institute/Princeton (2006-2008)
- John A. Goff Prize, University of Pennsylvania (2006)

- Graduate Research Symposium Award, University of Pennsylvania (2006)
- Graduate Student Award, International Society of Biorheology (2005)
- Graduate Student Award, Biomedical Engineering Society (2004)
- Ashton Foundation Predoctoral Fellowship (2002-2006)
- National Science Foundation - REU Fellowship (2001)

### **PROFESSIONAL SOCIETY MEMBERSHIPS**

- American Heart Association (AHA) (2012-present)
- American Society for Cell Biology (ASCB) (2002-present)
- American Society for Matrix Biology (ASMB) (2008-present)
- American Society for Mechanical Engineering (ASME) (2002-2015)
- Biomedical Engineering Society (BMES) (2002-present)
- Biophysical Society (2002-present)
- International Society for Stem Cell Research (ISSCR) (2008-2015)

## **PUBLICATIONS**

### **REFEREED JOURNAL PUBLICATIONS**

**(Google Scholar: 28,000+ citations; H-index = 51; i10-index = 94)**

1. Teng, E.L., Masutano, E.M., Fung, J., Lian, R., Ngo, B., Kumar, A., Placone, J.K., Lo Sardo, V. and Engler, A.J. “High Shear Stress enhances Endothelial Permeability in the presence of the Risk Haplotype at 9p21.3” (submitted)
2. Whitehead, A.J., Hocker, J.D., Bing Ren, B., Engler, A.J. “Methods for Cardiac Fibroblast Generation from iPSCs: Updates and Characterization” (submitted)
3. Whitehead, A.J. and Engler, A.J. “Meta-Analysis of Regenerative Crosstalk between Cardiac Cells and Macrophages” (submitted)
4. Ruoss, S., Ball, S.T., Dorn, S.N., Parekh, J.N., Whitehead, A., Engler, A.J., Ward, S.R. “Acetabular bone marrow aspiration during total hip arthroplasty” (submitted)
5. Yeoman, B., Shatkin, G., Beri, P., Katira, P.,\* and Engler, A.J.,\* “Escaping the Stiffness Trap: Adhesion Strength and Contractility Enable Metastatic Cells to become Adurotactic” *Cell Reports*, 2021. 34(10): 108816. \*co-corresponding author
6. Banisadr, A., Eick, M., Beri, P., Parisian, A.D., Yeoman, B., Placone, J.K., Engler, A.J.,\* and Furnari, F.\* “EGFRvIII uses Intrinsic and Extrinsic Mechanisms to Reduce Glioma Adhesion and Increase Migration” *J Cell Sci*, 2020. 133(24): jcs247189. \*co-senior authors
7. Shatkin, G., Yeoman, B., Birmingham, K., Katira, P., and Engler, A.J. “Computational Models of Migration Modes Improve our Understanding of Metastasis” *APL Bioengineering*, 2020. 4: 041505.
8. Fattet, L., Jung, H.-Y., Matsumoto, M., Aubol, B.E., Kumar, A., Adams, J.A., Chen, A.C., Sah, R.L., Engler, A.J., Pasquale, E.B., and Yang, J. “Matrix rigidity controls epithelial-mesenchymal plasticity and tumor metastasis via a mechanoresponsive EPHA2/LYN complex.” *Dev. Cell*, 2020. 54(3):302-316.e7.

9. Meckelmann, S.W., Hawksworth, J.I., White, D., Andrews, R., Rodrigues, P., O'Connor, A., Alvarez-Jarreta, J., Tyrrell, V.J., Hinz, C., Zhou, Y., Williams, J., Aldrovandi, M., Watkins, W.J., Engler, A.J., Lo Sardo, V., Slatter, D.A., Allen, S.M., Acharya, J., Mitchell, J., Cooper, J., Aoki, J., Kano, K., Humphries, S.E., O'Donnell, V.B. "Metabolic dysregulation of the lysophospholipid/autotaxin axis in the chromosome 9p21 gene SNP rs10757274." *Circulation: Genomic Prec. Med.*, 2020. 13(3): e002806.
10. Plunkett, C.M.,\* Kumar, A.,\* Yrastorza, J., Hou, Y.-H., Placone, J.K., Grennan, G., and Engler, A.J. "H-Ras Transformation of Mammary Epithelial Cells Induces ERK-Mediated Invasion on Low Stiffness Matrix" *Adv Healthcare Mat*, 2020. 9(8): e1901366  
\*co-first authors
11. Huang, N.F., Chaudhuri, O., Cahan, P., Wang, A., Engler, A.J., Wang, P., Kumar, S., Khademhosseini, A., and Li, S. "Multi-Scale Cellular Engineering: From Molecules to Organ-on-a-Chip" *APL Bioeng*, 2020. 4(1): 010906.
12. Beri, P., Popravko, A., Yeoman, B., Kumar, A., Chen, K., Hodzic, E., Chiang, A., Banisadr, A., Placone, J.K., Carter, H., Fraley, S.I., and Engler, A.J. "Cell adhesiveness serves as a biophysical marker for metastatic potential" *Cancer Res*, 2020. 80(4): 901-911.
13. Wong, L., Kumar, A., Gabela-Zuniga, B., Chua, J., Singh, G., Happe, C.L., Engler, A.J., Fan, Y., and McCloskey, K.E. "Substrate Stiffness Directs Diverging Vascular Fates" *Acta Biomater.*, 2019. 96: 321-329.
14. Velez, D.O., Ranamukhaarachchi, S.K., Modi, R.N., Kumar, A., Lim, E.W. Engler, A.J., Metallo, C.M., and Fraley, S.I. "3D collagen architecture regulates cell adhesion through degradability, thereby controlling metabolic and oxidative stress" *Integr. Biol.*, 2019. 11(5): 221-234.
15. Teng, E.L., and Engler, A.J. "Mechanical influences on Cardiovascular Differentiation and Disease Modeling" *Exp Cell Res*, 2019. 377(1-2): 103-108.
16. Ondeck, M.G.,\* Kumar, A.,\* Placone, J. K.,\* Plunkett, C.M., Matte, B.F., Wong, K.C., Fattet, L., Yang, J., and Engler, A.J. "Dynamically Stiffening Niche Promote Malignant Transformation via Collective Mechanical Signaling" *Proc Nat Acad Sci*, 2019. 116(9): 3502-3507. \*co-first authors
17. Deacon, D.C.†, Happe, C.L.†, Chen, C.†, Tedeschi, N., Manso, A.M., Dalton, N.D., Peng, Q., Gu, Y., Tenerelli, K.P., Tran, V.D., Chen, J., Peterson, K.L., Schork, N.J., Adler, E.D., Engler, A.J.\*, Ross, R.S.,\* and Chi, N.C.\* "Genome-edited cardiac models reveal combinatorial genetic interactions in human cardiomyopathy" *Nature Biomed Eng*, 2019. 3(2): 147-157. †co-first authors \*co-corresponding authors
18. Kumar, A., Thomas, S.K., Wong, K.C., Lo Sardo, V., Cheah, D.S., Hou, Y.-H., Placone, J.K., Tenerelli, K.P., Ferguson, W.C., Torkamani, A., Topol, E.J., Baldwin, K.K., Engler, A.J. "Mechanical activation of non-coding-RNA-mediated regulation of disease-associated phenotypes in human cardiomyocytes" *Nature Biomed Eng*, 2019. 3(2): 137-146.

19. Ranamukhaarachchi, S, Modi, R.,N., Han, A., Velez, D.O., Kumar, A., Engler, A.J., and Fraley, S.I. “Macromolecular crowding tunes 3D collagen architecture and cell morphogenesis behaviors” *Biomaterials Science*, 2019. 7(2): 618-633.
20. Matte, B.F., Kumar, A., Placone, J.K., Zanella, V.G., Martins, M.D., Engler, A.J., and Lamers, M.L. “Matrix stiffness mechanically conditions EMT and migratory behavior of Oral Squamous Cell Carcinoma” *J Cell Sci*, 2019. 132: jcs224360.
21. Lo Sardo, V., Chubukov, P., Ferguson, W., Kumar, A., Teng, E.L., Duran, M., Zhang, L., Cost, G., Engler, A.J., Urnov, F., Topol, E.J., Torkamani, A., Baldwin, K.K. “Unveiling the Role of the Most Impactful Cardiovascular Risk Locus Through Haplotype Editing” *Cell*, 2018. 175(7): 1796-1810.
22. Beri, P., Matte, B.F, Fattet, L., Kim, D., Yang, J., and Engler, A.J. “Biomaterials to model and measure epithelial cancers” *Nature Rev Materials*, 2018. 3, 418-430.
23. Zhou, Y., Horowitz, J.C., Naba, A., Ambalavanan, N., Atabai, K., Balestrini, J., Bitterman, P.B., Corley, R.A., Ding, B.S., Engler, A.J., Hansen, K.C., Hagood, J.S., Kheradmand, F., Lin, Q.S., Neptune, E., Niklason, L., Ortiz, L.A., Parks, W.C., Tschumperlin, D.J., White, E.S., Chapman, H.A., and Thannickal, V.J. “Extracellular matrix in lung development, homeostasis and disease.” *Matrix Biol.*, 2018. 73: 77-104.
24. Meng, Z., Qiu, Y., Lin, K-C, Kumar, A., Placone, J. K., Fang, C., Wang, K-C, Lu, S., Pan, M., Hong, A. W., Moroishi, T., Luo, M., Plouffe, S. W., Diao, Y., Ye, Z., Park, H. W. Wang, X., Yu, F-X, Chien, S., Wang, C-Y, Ren, B., Engler, A.J., and Guan, K.-L. “RAP2 Mediates Mechano-Responses of Hippo pathway” *Nature*, 2018. 560: 655-660.
25. Sessions, A.O. Min, P., Cordes, T., Weickert, B.J., Divakaruni, A.S., Murphy, A.N., Metallo, C.M., and Engler, A.J. “Preserved Cardiac Function by Vinculin Enhances Glucose Oxidation and Extends Health- and Life-span” *APL Bioengineering*, 2018. 2(3): 036101.
26. Placone, J.K. and Engler, A.J. “Recent advances in extrusion-based 3D printing for biomedical applications” *Adv. Healthcare Mater.*, 2018. 7(8): 1701161.
27. Gibbons, M.G, Singh, A., Engler, A.J., and Ward. S.R. “The Role of Mechanobiology in Progression of Rotator Cuff Muscle Atrophy and Degeneration” *J Ortho Res*, 2018. 36(2): 546-556.
28. Gibbons, M.C., Fisch, K.M., Pichika, R., Cheng, T., Engler, A.J., Schenk, S., Lane, J.G., Singh, A., Ward, S.R. “Heterogeneous muscle gene expression patterns in patients with massive rotator cuff tears” *PLOS ONE*, 2017. 13(1): e0190439.
29. Kumar, A.,<sup>†</sup> Placone, J.K.,<sup>†</sup> and Engler, A.J. “Understanding the Extracellular Forces that Determine Cell Fate and Maintenance” *Development*, 2017. 144(23): 4261-4270. <sup>†</sup>co-first authors
30. Sessions, A.O., Kaushik, G., Parker, S., Raedschelders, K., Duong, J.T., Bodmer, R., Van Eyk, J.E., and Engler, A.J. “Extracellular Matrix Downregulation in the Drosophila Heart

- Preserves Contractile Function and Improves Lifespan.” *Matrix Biol.*, 2017. 62(1): 15-27.
31. Thomas, K.A., Gibbons, M.C., Lane, J.G., Singh, A., Ward, S.R., and Engler, A.J. “Rotator cuff tear state modulates self-renewal and differentiation capacity of skeletal muscle progenitor cells” *J Ortho Res*, 2017. 35(8): 1816-1823
  32. Barker, T.H. and Engler, A.J. “The Provisional Matrix: Setting the Stage for Tissue Repair Outcomes.” *Matrix Biol.*, 2017. 60-61: 1-4.
  33. Happe, C.L., Tenerelli, K.P., Gromova, A.K., Kolb, F., and Engler, A.J. “Mechanically Patterned Neuromuscular Junctions-in-a-dish Have Improved Functional Maturation” *Mol Bio Cell*, 2017. 28(14): 1950-1958.
  34. Herum, K.M., Choppe, J., Kumar, A., Engler, A.J., and McCulloch, A.M. “Mechanical regulation of cardiac fibroblast pro-fibrotic phenotypes” *Mol Bio Cell*, 2017. 28(14): 1871-1882.
  35. Hadden, W.J., Young, J.L., Holle, A.W., Taylor-Weiner, H., Wen, J.H., Lee, A., Spatz, J.P., Engler, A.J., and Choi, Y.S. “Tunable stiffness gradient hydrogels for stem cell mechanobiology” *Proc Nat Acad Sci*, 2017. 114(22): 5647-5652.
  36. Fuhrmann, A., Banisadr, A., Beri, P., Tlsty, T.D., and Engler, A.J. “Metastatic State of Cancer Cells may be indicated by Adhesion Strength.” *Biophys J*, 2017. 112(4): 736-745.
  37. Gibbons, M.C., Singh, A., Anakwenze, O., Cheng, T., Pomerantz, M.D., Schenk, S., Engler, A.J., and Ward, S.R. “Histological Assessment of Chronically Torn Human Rotator Cuff Muscle: Evidence of Degeneration, Regeneration and Remodeling” *J Bone Joint Surg Am.*, 2017. 99(3): 190-199.
  38. Blice-Baum, A.C., Zambon, A.C., Kaushik, G., Viswanathan, M.C., Engler, A.J., Bodmer, R., and Cammarato, A. “Modest overexpression of *FOXO* maintains cardiac proteostasis and ameliorates age - associated functional decline” *Aging Cell*, 2017. 16(1): 93-103.
  39. Gibbons, M.C., Sato, E.J., Bachasson, D., Cheng, T., Azimi, H., Schenk, S., Engler, A.J., Singh, A., Ward, S.R. “Muscle Architectural Changes After Massive Human Rotator Cuff Tear” *J Ortho Res*, 2016; 34(12): 2089-2095.
  40. Holle, A.W., McIntyre, A.J., Kehe, J., Wijesekara, P., Young, J.L., Vincent, L.G., and Engler, A.J. “High content image analysis of focal adhesion-dependent mechanosensitive stem cell differentiation” *Integr. Biol.* 2016; 8, 1049–1058.
  41. Sessions, A.O. and Engler, A.J. “Mechanical Regulation of Cardiac Aging in Model Systems” *Circ Res*, 2016; 18(10): 1553-62.
  42. Zhang, Z.-N., Freitas, B.C., Qian, H., Lux, J., Acab, A.J., Trujillo, C., Herai, R., Nguyen Huu, V.A., Wen, J.H., Joshi-Barr, S., Karpiak, J.V, Engler, A.J., Fu, X.-D., Muotri, A.R., and Almutairi, A. “Layered hydrogels accelerate iPSC-derived neuronal maturation and reveal migration defects in Rett syndrome” *Proc Nat Acad Sci*, 2016; 113(12):3185-90.

43. Ondeck, M., and Engler, A.J. “Mechanical Characterization of a Dynamic and Tunable Methacrylated Hyaluronic Acid Hydrogel” *J Biomech Eng*, 2016; 138(2):021003-021003-6.
44. Happe, C.L., and Engler, A.J. “Mechanical Forces Reshape Differentiation Cues that Guide Cardiomyogenesis” *Circ Res*, 2016. 118(2): 296-310.
45. Wen, J.H., Choi, O., Taylor-Weiner, H., Fuhrmann, A., Karpiak, J.V. Almutairi, A., and Engler, A.J. “Haptotaxis is cell type specific and limited by substrate adhesiveness.” *Cell Mol Bioeng*, 2015. 8(4): 530-542.
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48. Fuhrmann, A. and Engler, A.J. “The Cytoskeleton Regulates Cell Attachment Strength” *Biophys J*, 2015. 109(1): 57–65.
49. Kaushik, G., Spenlehauer, A., Sessions, A.O., Trujillo, A.S., Fuhrmann, A., Fu, Z., Venkatraman, V., Pohl, D., Tuler, J., Wang, M., Lakatta, E.G, Ocorr, K., Bodmer, R., Bernstein, S.I., Van Eyk, J.E., Cammarato, A., and Engler, A.J. “Vinculin-network mediated Cytoskeletal Remodeling and Regulation of Contractile Function in Aging Myocardium” *Science Trans Med*, 2015. 292: 292ra99.
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53. Jun, I., Lee, Y.B., Choi, Y.S., Engler, A.J., Park, H., Shin, H. “Transfer stamping of human mesenchymal stem cell patches using thermally expandable hydrogels with tunable cell-adhesive properties.” *Biomaterials*, 2015. 54: 44-54.

54. Viswanathan, P.,\* Ondeck, M.G.,\* Chirasatitsin, S., Nghamkham, K., Reilly, G.C., Engler, A.J., and Battaglia, G. “3D Surface Topology Guides Stem Cell Adhesion and Differentiation” *Biomaterials*, 2015. 52:140-147. \*co-first authors
55. Meyer, G.A., Farris, A., Sato, E., Gibbons, M., Lane, J.G., Ward, S.R. and Engler, A.J. “Muscle Progenitor Cell Regenerative Capacity in the Torn Rotator Cuff” *J Ortho Res*, 2015. 33(3): 421-429.
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57. Thomas, K.A., Engler, A.J., and Meyer, G.A. “Extracellular Matrix Regulation in the Muscle Satellite Cell Niche” *Connective Tissue Res*, 2015. 56(1): 1-8.
58. Wen, J.H.,\* Vincent, L.G.,\* Choi, Y.S., Fuhrmann, A., Hribar, K., Taylor-Weiner, H., Chen, S., and Engler, A.J. “Interplay of Matrix Stiffness and Protein Tethering in Mechanically Based Differentiation” *Nature Materials*, 2014. 13(10): p. 979-987. \*co-first authors
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60. Hribar, K.C., Choi, Y.S., Ondeck, M., Engler, A.J., Chen, S. “Digital Plasmonic Patterning of Hydrogels” *Adv Funct Mat*, 2014. 24(31): 4922–4926.
61. Fuhrmann, A., Li, J., Chien, S., and Engler, A.J. “Cation Type Specific Cell Remodeling Regulates Attachment Strength” *PLOS ONE*, 2014. 9(7): e102424.
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64. Viswanathan, M.C., Kaushik, G., Engler, A.J., Lehman, W., and Cammarato, A. “A Drosophila model of diastolic dysfunction and cardiomyopathy based on impaired troponin function” *Circ Research*, 2014. 114:e6-e17.
65. Holle, A.W., Tang, X., Vijayraghavan, D., Vincent, L.G., Fuhrmann, A., Choi, Y.S., del Alamo, J.C., and Engler, A.J. “*In Situ* Mechanotransduction via Vinculin Regulates Stem Cell Myogenesis” *Stem Cells*, 2013. 31(11): 2467-77.
66. Rao, N., Grover, G.N., Vincent, L.G., Evans, S.C., Choi, Y.S., Spencer, K.H., Hui, E.E., Engler, A.J., and Christman, K.L. “A co-culture device with a tunable stiffness to understand combinatorial cell-cell and cell-matrix interactions” *Integr. Biol.*, 2013. 5(11): 1344 – 1354.

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68. Young, D.A., Choi, Y.S., Engler, A.J., and Christman, K.L. “Mimicking the stiffness of adipose tissue stimulates adipogenesis of adult adipose-derived stem cells” *Biomaterials*, 2013. 34(34): 8581-8588.
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105. Engler, A.,\* Bacakova, L.,\* Newman, C., Hategan, A., Griffin, M., and Discher, D. “Substrate Compliance versus Ligand Density in Cell on Gel Responses.” *Biophysical J*, 2004. 86(1): 617-628. \*co-first authors

### **BOOK CHAPTERS**

1. Whitehead, A.J., Kirkland, N., and Engler, A.J. “Atomic Force Microscopy for Live-Cell and Hydrogel Measurement” in *Myofibroblasts: Fundamentals, Laboratory Methods and Anti-Fibrotic Drug Discovery*, Hinz, B. and Lagares, D., Editors. 2021, Springer Nature. (in press)
2. LaPointe V.L.S., de Boer, J., and Engler, A.J. “Cellular Signaling” in *Tissue Engineering*, van Blitterswijk, C. and J. de Boer, Editors. 2014, Elsevier Science: London. Vol. 2. Pg. 111-148.
3. Kaushik, G. and Engler, A.J. “From Stem Cells to Cardiomyocytes: The Role of Forces in Cardiac Maturation, Aging, and Disease” in *Progress in Molecular Biology and Translational Science*, Kumar, S. and A. J. Engler, Editors. 2014, Elsevier Science: London. Vol. 126, pg. 219–242.
4. Ondeck, M.G. and Engler, A.J. “Dynamic Materials Mimic Development and Disease Changes in Tissues” in *Bio-inspired Materials for Biomedical Engineering*, Brennan, A.B. and Kirschner, C.M., Editors. 2014, John Wiley & Sons: New York. pg. 25-44.
5. Wen, J.H., Taylor-Weiner, H., Fuhrmann, A. and Engler, A.J. “Cell Mechanics on Surfaces” in *Biomaterials Surface Science*, Taubert, A, Mano, J. and Rodriguez-Cabello, J.C., Editors. 2013, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany. pg. 511-537.
6. Choi, Y.S., Holle, A.W., and Engler, A.J. “Engineered ECM Microenvironments and their Regulation of Stem Cells” in *Extracellular Matrix in Development from Biology of Extracellular Matrix* (series), Mecham, R. and DeSimone, D., Editors. 2013, Springer: Heidelberg. pg. 133-160.
7. Varghese, S. and Engler, A.J. “Musculoskeletal Cell Mechanics” in *Orthopaedic Biomechanics*, Winkelstein, B.A., Ed. 2012, Taylor & Francis: New York. pg. 303-325.
8. Vincent, L., and Engler, A.J. “Effect of Substrate Modulus on Cell Function and Differentiation” in *Comprehensive Biomaterials*, Healy, K.E., Ducheyne, P., and J. Kirkpatrick, Editors. 2011, Elsevier Science: London. Vol. 5. pg. 51-64.
9. Helen, W. and Engler, A.J. “Mechanobiology in the Stem Cell Niche: Integrating Physical and Chemical Regulation of Differentiation,” in *Mechanobiology Handbook*, Nagatomi, J., Ed. 2010, CRC Press: Boca Raton, FL. pg. 439-455.

10. Young, J.L., Christman, K.L., and Engler, A.J. “Stem Cells for Cardiac Tissue Engineering,” in *Stem Cells and Tissue Engineering*, S. Li, N. L’Heureux, and J.H. Elisseeff, Editors. 2010, World Scientific Publishing: Singapore. pg. 95-114.
11. Rehfeldt, F., Engler, A.J., and Discher, D. E. “Stem Cells and Nanomedicine: Nanomechanics of the Microenvironment,” in *Nanotechnology*, 2010. 305–322.
12. Engler, A.J., Rehfeldt, F., Sen, S., and Discher, D.E., “Micro-Tissue Elasticity: Measurements by Atomic Force Microscopy and its Influence on Cell Differentiation,” in *Methods in Cell Biology: Cell Mechanics*, D.E. Discher and Y-L Wang, Editors. 2007, Elsevier: New York. pg. 521-545.
13. Frey, M.T., Engler, A., Discher, D.E., Lee, J., and Wang, Y-L, “Microscopic Methods for Measuring the Elasticity of Gel Substrates for Cell Culture: Microspheres, Microindenters, and Atomic Force Microscopy,” in *Methods in Cell Biology: Cell Mechanics*, D.E. Discher and Y-L Wang, Editors. 2007, Elsevier: New York. pg. 47-65.

### **COMMENTARIES**

1. Engler, A.J. and Cooper-White, J. “Academic vs industry perspectives in 3D bioprinting” *APL Bioeng* 2020. 4(1): 010401.
2. Engler, A.J. and Discher, D.E. “Rationally engineered advances in cancer research” *APL Bioeng* 2018. 2(3): 031601.
3. Vincent, L.G. and Engler, A.J. “Stem Cell Differentiation: Post degradation Forces Kick-in” *Nat Materials* 2013. 12(5): 384-6.
4. Holle, A.W. and Engler, A.J. “Cell rheology: Stressed-out stem cells” *Nat Materials* 2010. 9(1): 4-6.
5. Merryman, W.D. and Engler, A.J. “Innovations in cell mechanobiology.” *J Biomech.* 2010 Jan 5; 43(1): 1-2.
6. Oh, S., Brammer, K.S., Li, Y.S.J., Teng, D., Engler, A.J., Chien, S., and Jin, S. “Reply to von der Mark et al.: Looking further into the effects of nanotube dimension on stem cell fate” *Proc Nat Acad Sci USA*, 2009. 106(24): E61.

### **U.S. PATENTS**

1. Engler, A.J., Banisadr, A., Beri, P., and Fuhrmann, A. “Method and Device for Early Cancer Screening” (Application 62/978,658)
2. Kumar, A, Ondeck, M., Engler, A.J. “Systems and Methods of Disease Modeling Using Static and Time-dependent Hydrogels.” (US20170328889)
3. Engler, A.J., Sweeney, H.L., and Discher D.E. “Regulating stem cell differentiation by controlling matrix elasticity” (US2007190646)

### **INVITED TALKS**

- “Understanding and Exploiting Cancer Mechanobiology”  
 Mechanobiology in Health and Disease, Nature Conferences and Chinese Academy of Medical Sciences (2020); Beijing, China

4th International Mechanobiology Conference (2020); Sydney, NSW Australia  
 Multiscale Modeling and Cell Fate Processes Workshop, UC Irvine (2020); Irvine, CA  
 Department of Biomedical Engineering, Syracuse University (2020); Syracuse, NY  
 Department of Biomedical Engineering, Virginia Commonwealth University (2020); Richmond, VA  
 Department of Bioengineering, University of Washington (2020); Seattle, WA  
 Mechanobiology SIG, 64<sup>th</sup> Biophysical Society Annual Meeting (2020); San Diego, CA  
 Society for Engineering Science Annual Meeting (2019); St. Louis, MO  
 13<sup>th</sup> Aegean Conference on Pathways, Networks and Systems Medicine (2019); Crete, Greece

“Improving on “Disease-in-a-dish:” How Engineered Niche Induce Novel Phenotypes from induced Pluripotent Stem Cells (iPSCs)”

World Biomaterials Congress (2020); Glasgow, Scotland  
 Department of Bioengineering, University of Washington (2020); Seattle, WA  
 BMES Cellular and Molecular Bioengineering Meeting (2020); San Juan, PR  
 Dept. of Bioengineering, University of Colorado, Denver (2019); Denver, CO  
 8th Symposium on Regenerative Rehabilitation (2019); Charlottesville, VA  
 RIKEN BDR Symposium “Control and Design of Biosystems” (2019); Kobe, Japan  
 International Symposium on Nanoarchitectonics for Mechanobiology (2019); Tsukuba, Japan  
 9<sup>th</sup> International Conference on Advanced Materials and Nanotechnology (2019); Wellington, New Zealand  
 BMES Cellular and Molecular Bioengineering Meeting (2019); San Diego, CA  
 6<sup>th</sup> International Conference on Stem Cell Engineering (2018); Los Angeles, CA  
 American Society for Matrix Biology (2018); Las Vegas, NV  
 IUTAM Symposium on Mechanical Environments of Living Cells (2018); Xi’an, China  
 8th World Congress of Biomechanics (2018); Dublin, Ireland  
 AHA/ASA International Stroke Conference (2018); Los Angeles, CA  
 8<sup>th</sup> AFMBIOMED Meeting (2017); Krakow, Poland  
 Matrix Biology Ireland (2017); Dublin, Ireland  
 Dept. of Bioengineering, University of Pennsylvania (2017); Philadelphia, PA  
 NIH Cardiovascular Tissue Engineering Meeting (2017); Birmingham, AL  
 Society for Biomaterials (2017); Minneapolis, MN  
 BMES Cellular and Molecular Bioengineering Meeting (2017); Kona, HI  
 Dept. of Bioengineering, University of California, Berkeley (2016); Berkeley, CA  
 Biophysical Society Thematic Meeting: Mechanobiology of Disease (2016); Singapore  
 1st International Conference of Molecular Engineering of Polymers (2016); Shanghai, China  
 Carolina Biophysics Symposium (2016); Chapel Hill, NC  
 Dept. of Biomedical Engineering, Cornell University (2016); Ithaca, NY

“Genome-Edited Cardiac Models Reveal that Combinatorial Genetic Interactions can Impair Mechanotransduction”

Cardiovascular Research Center, University of Virginia (2019); Charlottesville, VA  
 8th World Congress of Biomechanics (2018); Dublin, Ireland  
 Biomedical Engineering Society Meeting (2018); Atlanta, GA

“Niche Dynamics Promote Epithelial-Mesenchymal Transition via Mechanical Signaling”

Dept. of Mechanical Engineering, University of Southern California (2018); Los Angeles, CA  
 American Society for Investigative Pathology @ Experimental Biology Meeting (2018); San Diego, CA

American Society for Matrix Biology (2016); St. Petersburg, FL  
 Biomedical Engineering Society Meeting (2016); Minneapolis, MN  
 World Biomaterials Congress (2016); Montreal, Canada  
 American Association of Anatomist @ Experimental Biology Meeting (2016); San Diego, CA  
 American Chemical Society Biennial Meeting (2016); San Diego, CA  
 55<sup>th</sup> Annual American Society for Cell Biology Meeting (2015); San Diego, CA  
 Gordon Conference: Collagen (2015); New London, NH  
 Wake Forest Institute for Regenerative Medicine (2015); Winston-Salem, NC  
 Biomedical Engineering Society Meeting (2015); Tampa, FL  
 Fischell Dept. of Bioengineering, University of Maryland (2015); College Park, MD  
 Cell-Matrix Mechanobiology Workshop (2015); Urbana-Champaign, IL

“Mechanical Signaling and its Role in Differentiation, Aging, and Disease”

Biomedical Engineering Society Meeting (2018); Atlanta, GA  
 American Association of Anatomist @ Experimental Biology Meeting (2016); San Diego, CA  
 Biomaterials Seminar Series, University of Michigan (2015); Ann Arbor, MI  
 XIII Simpósio Brasileiro de Matriz Extracelular (2015); Buzios, Rio de Janeiro, Brazil  
 Dept. of Bioengineering, University of California, Riverside (2015); Riverside, CA  
 Dept. of Biomedical Engineering, University of Minnesota (2015); Minneapolis, MN  
 Stem Cell Institute, University of Southern California (2015); Los Angeles, CA  
 14<sup>th</sup> Annual ISSCR Meeting (2015); Stockholm, Sweden  
 Summer Biomechanics, Bioengineering, and Biotransport Conference (2015); Snowbird, UT  
 Wake Forest Institute for Regenerative Medicine (2015); Winston-Salem, NC  
 International Workshop on Multiscale Mechanobiology (2015); New York, NY

“Cytoskeletal remodeling modulates cardiomyocyte contractile function during aging”

Summer Biomechanics, Bioengineering & Biotransport Conference (2016); Washington, D.C.  
 7<sup>th</sup> AFMBIOMED Meeting (2016): Porto, Portugal  
 Insect Muscle Meeting, Johns Hopkins University (2015); Baltimore, MD  
 Develop and Aging Program, Sanford-Burnham Medical Research Institute (2015); La Jolla, CA  
 Dept of Pathology, UC San Diego (2014); La Jolla, CA  
 World Congress of Biomechanics (2014); Boston, MA  
 Dept. of Bioengineering, University of Washington (2014); Seattle, WA

“Interplay of Material Stiffness and Protein Tethering in Mechanically Based Differentiation”

Dept. of Physics, Wake Forest University (2015); Winston-Salem, NC  
 24<sup>th</sup> Cytometry Development Workshop: Technologies for Cell Analysis (2014); La Jolla, CA  
 Biomedical Engineering Society Meeting (2014); San Antonio, TX  
 9<sup>th</sup> Stem Cell Meeting on the Mesa (2014); La Jolla, CA  
 NHLBI Workshop on Lung Mechanobiology (2014); Bethesda, MD  
 World Congress of Biomechanics (2014); Boston, MA  
 Nature Conference on Genomic Technologies and Biomaterials (2014); San Diego, CA  
 International Workshop on Multiscale Mechanobiology (2014); Hong Kong, China  
 Dept. of Bioengineering, University of California, Los Angeles (2014); Los Angeles, CA  
 Dept. of Biomedical Engineering, Georgia Tech (2014); Atlanta, GA

“Traction Forces via Integrin Signaling are Necessary for Endoderm Specification”

American Society for Matrix Biology (2014); Cleveland, OH

World Congress for Regenerative Medicine (2013); Leipzig, Germany

“Cell instructive scaffolds through interface engineering”

3<sup>rd</sup> Global Congress on NanoEngineering for Medicine and Biology (2014); San Francisco, CA

World Congress for Regenerative Medicine (2013); Leipzig, Germany

Stony Brook University Stem Cell Symposium (2013); Stony Brook, NY

Cambridge Stem Cell Institute Symposium (2013); Cambridge, UK

Dept of Mechanical Engineering, POSTECH University (2013); Pohang, Republic of Korea

43<sup>rd</sup> Princess Takamatsu Cancer Symposium (2012); Tokyo, Japan

Cell Biophysics Summer School, University of Ottawa (2012); Ottawa, Canada

Gordon Conference: Signal Transduction By Engineered ECMs (2012); Biddeford, ME

9<sup>th</sup> World Biomaterials Congress (2012); Chengdu, China

International Conference on Stem Cell Engineering (ICSCE) (2012); Seattle, WA

Spring Meeting, Material Research Society (MRS) (2012); San Francisco, CA

“Vinculin Mechanosensing and its Role in Differentiation, Disease, and Aging”

Dept. of Biophysics, University of Gottingen (2013); Gottingen, Germany

8<sup>th</sup> Stem Cell Meeting on the Mesa (2013); La Jolla, CA

Dept. of Bioengineering, University of California, Irvine (2013); Irvine, CA

Graduate Programs in Bioengineering and Pharmaceutical Sciences & Pharmacogenomics;

University of California, San Francisco (2013); San Francisco, CA

Dept of Biomedical Engineering; Tufts University (2013); Medford, MA

Dept of Biochem & Mol Genetics; University of Alabama-Birmingham (2013); Birmingham, AL

Muscle Development & Regeneration Program; Sanford-Burnham Institute (2013); La Jolla, CA

Dept. of Bioengineering, University of Pennsylvania (2013); Philadelphia, PA

Regen. Med. & Rehab. Mtg., American Physical Therapy Assoc. (2012); Beaver Hollow, NY

Amer. Soc. for Investigative Pathology Experimental Biology Meeting (2012); San Diego, CA

Dept. of Cell and Developmental Biology, Vanderbilt University (2012); Nashville, TN

American Physical Society March Meeting (2012); Boston, MA

Dept. of Cardiology, University of California, San Diego (2012); La Jolla, CA

Rheumatology, Allergy & Immunology Seminars Series, UCSD (2011); San Diego, CA

Bionanotechnology IGERT, UIUC (2011); Urbana-Champaign, IL

“Probing Mechanisms of Mechano-sensitive Differentiation in Mesenchymal Stem Cells”

Division of Physics, University of California, San Diego (2012); La Jolla, CA

Institute for Bioeng’g; Ecole Polytechnique Federale de Lausanne (2011); Lausanne, Switzerland

American Physiological Society @ Experimental Biology Meeting (2011); Washington, DC

Tokyo Medical and Dental University (2011); Tokyo, Japan

Translational Excellence in Regenerative Medicine Meeting (2010); Amsterdam, Netherlands

Dept. of Mech. & Aerospace Eng’g, University of California, San Diego (2010); La Jolla, CA

ASME Summer Bioengineering Conference (2010); Naples, FL

“Intrinsic Matrix Properties Govern Embryonic Stem Cell Function”

INSERM/Nantes Stem Cell Meeting (2011); Nantes, France

American Society for Matrix Biology Biennial Meeting (2010); Charleston, SC

Gordon Conference: Signal Transduction By Engineered ECMs (2010); Biddeford, ME

American Association of Anatomist @ Experimental Biology Meeting (2010); Anaheim, CA

Dept. of Bioengineering, University of California, Berkeley (2010); Berkeley, CA  
 Dept. of Bioengineering, University of California, Irvine (2010); Irvine, CA  
 2<sup>nd</sup> TERMIS World Congress (2009); Seoul, South Korea  
 Tissue & Cell Engineering Society Annual Meeting (2009); Glasgow, Scotland UK  
 British Society for Matrix Biology Meeting (2009); London, England UK

“Towards ‘Smart’ Materials to Mimic Stem and Cardiomyocyte Microenvironments”

2<sup>nd</sup> TERMIS World Congress (2009); Seoul, Republic of Korea  
 Dept. of Mech. & Aerospace Eng’g, University of California, San Diego (2009); La Jolla, CA  
 Biomedical Sciences Program, University of California, San Diego (2009); La Jolla, CA  
 Stem Cell Institute, Salk Institute (2009); La Jolla, CA  
 Dept. of Cardiology, University of California, San Diego (2009); La Jolla, CA

“Stem Cells are Touchy-Feely: A Role for Matrix in Development and Disease”

Tokyo Medical and Dental University (2011); Tokyo, Japan  
 Dept. of Biomedical Engineering; University of Alabama-Birmingham (2008); Birmingham, AL  
 Annual Biomedical Engineering Society (2008); St. Louis, MO  
 19<sup>th</sup> Federation of European Connective Tissue Societies Meeting (2008); Marseille, France  
 47<sup>th</sup> Annual American Society for Cell Biology Meeting (2007); Washington, D.C.  
 37<sup>th</sup> International Sun Valley Workshop on Skeletal Tissue Biology (2007); Sun Valley, ID  
 Dept. of Biomedical Engineering; University of Wisconsin-Madison (2007); Madison, WI  
 Institute for Bioeng’g; Ecole Polytechnique Federale de Lausanne (2007); Lausanne, Switzerland  
 Dept. of Biomedical Engineering; Boston University (2007); Boston, MA  
 IEEE-Engineering Medicine and Biology Society Annual Meeting (2006); New York, NY  
 Pennsylvania Muscle Institute Symposium (2006); Philadelphia, PA  
 12<sup>th</sup> International Congress of Biorheology (2005); Chongqing, P.R. China  
 Gordon Conference: Signal Transduction By Engineered ECMs (2004); Lewiston, ME  
 Pennsylvania Muscle Institute Symposium (2004); Philadelphia, PA

## RESEARCH FUNDING

### ACTIVE SUPPORT

<b>National Institutes of Health</b>		5/2018-4/2021
R21CA217735	Engler (PI)	\$620,000 TC
Title: <i>Developing Adhesive Technology as a Physical Marker of Highly Metastatic Cells</i>		
<b>National Institutes of Health</b>		8/2016-7/2021
R01CA206880	Engler (PI); Yang (co-PI)	\$1,805,706 TC
Title: <i>Biomaterial Mimicry of Dynamic Matrix Stiffening During Tumor Progression</i>		
<b>National Science Foundation</b>		9/2018-8/2021
1763139	Engler (PI); Katira (co-PI)	\$591,607 TC
Title: <i>Collaborative Research: Heterogeneous Cancer Cell Mechanics Differentially Drives Mechanosensing and Migration</i>		
<b>National Institutes of Health</b>		7/2013-5/2023
2R01AG045428	Engler (PI)	\$2,010,438 TC
Title: <i>Mechanogenetics: An Integrated Approach to Aging in Muscle Dysfunction</i>		
<b>National Science Foundation</b>		4/2019-3/2023

1852609	Engler (PI)	\$351,601 TC
Title: <i>REU Site: Engineered Materials for Tissue Engineering and Drug Delivery</i>		
<b>National Institutes of Health</b>		6/2018-5/2024
R25EB023839	Engler (PI)	\$108,000 TC
Title: <i>Interprofessional Design and Entrepreneurship in Medical Devices at UC San Diego</i>		
<b>National Institutes of Health</b>		4/2020 - 3/2025
R01NS116802	Engler (PI); Furnari (co-PI)	\$2,125,505 TC
Title: <i>Biophysical Interrogation of Signals that Drive GBM Invasion</i>		
<b><u>PENDING GIFTS</u></b>		
CS0394411	Engler (PI)	\$710,026 DC
Title: <i>Identifying Prognostic Signatures of Invasive HRT-Induced Breast Cancers</i>		
CS0394213	Yang (PI); Engler (co-PI)	\$1,574,000 DC
Title: <i>Targeting mechanotransduction to inhibit metastasis in breast cancer patients with high mammographic density</i>		
<b><u>PENDING SUPPORT</u></b>		
<b>National Institutes of Health</b>		4/2021 - 3/2024
R33CA256712A1	Engler (PI)	\$1,259,028 TC
Title: <i>Weak Cell Adhesion is a Prognostic Signature of Invasive Cancers</i>		
<b><u>COMPLETED SUPPORT</u></b>		
<b>Sekisui Chemical Co.</b>		10/2017-9/2019
20180646	Engler (PI)	\$155,000 TC
Title: <i>Developing PVA/B-based Biomaterials for Cardiovascular Applications</i>		
<b>National Science Foundation</b>		4/2016-3/2019
1559781	Engler (PI)	\$359,097 TC
Title: <i>REU Site: Engineered Materials for Tissue Engineering and Drug Delivery</i>		
<b>National Science Foundation</b>		4/2015-3/2018
1463689	Engler (PI)	\$400,000 TC
Title: <i>Strain-Activated Signaling within Cell Adhesions Dictates Cell Fate</i>		
<b>National Institutes of Health</b>		9/2011-8/2016
P30AR061303	Lieber (PI); Engler (co-Inv)	\$3,352,905 TC
Title: <i>San Diego Skeletal Muscle Research Center</i>		
<b>Department of Defense/CDMRP</b>		6/2013-5/2016
W81XWH-13-1-0133	Yang (PI); Engler (partnering PI)	\$116,250 TC
Title: <i>Regulation of Breast Cancer Stem Cell by Tissue Rigidity</i>		
<b>National Institutes of Health</b>		7/2010-6/2015
R01HL103566	Omens (PI); Engler (co-Inv)	\$1,931,250 TC
Title: <i>Cardiomyocyte mechanotransduction through the integrin complex</i>		

<b>Muscular Dystrophy Association</b> 241665	Engler (PI)	8/2012-7/2015 \$390,000 TC
Title: <i>Mechanically programmed adipose-derived stem cells to treat muscular dystrophy</i>		
<b>National Institutes of Health</b> DP02OD006460	Engler (PI)	9/2009-8/2014 \$2,317,500 TC
Title: <i>"Smart" Materials to Engineer a More Complete Stem Cell Niche</i>		
<b>National Institutes of Health</b> U54CA143803-03	Austin (PI); Engler (co-Inv)	8/2012-7/2013 \$77,500 TC
Title: <i>"Adhesive heterogeneity as an indicator of metastatic state"</i>		
<b>National Institutes of Health</b> R21HL106529	Engler (PI)	7/2011-6/2013 \$396,675 TC
Title: <i>Stem Cells and Dynamic Materials Improve Cardiac Function Post-Myocardial Infarction</i>		
<b>Human Frontier Science Program</b> RGY0064/2010	Engler (PI)	5/2010-4/2013 \$750,000 TC
Title: <i>Stem Cell Differentiation in 3D Nanostructured Environments</i>		
<b>National Institutes of Health</b> R21EB011727	Engler (PI)	5/2010-4/2012 \$357,807 TC
Title: <i>Improving Endoderm Specification with Hybrid Materials and Growth Factors</i>		
<b>American Heart Association</b> Beginning Grant-in-Aide: 0865150F	Engler (PI)	7/2008-6/2010 \$140,000 TC
Title: <i>From Physical to Molecular Mechanisms Governing Cardiomyocyte Function</i>		
<b>University of California, San Diego Academic Senate</b> RI-324G-ENGLER	Engler (PI)	1/2009-12/2009 \$8,595 TC
Title: <i>Undergraduate Research in Stem Cell Bioengineering</i>		

## UNIVERSITY AND PROFESSIONAL SERVICE

### UNIVERSITY COMMITTEE SERVICE

- **University of California, San Diego**, La Jolla, CA  
Department of Bioengineering Undergraduate Studies Committee (2009-2016); Department of Bioengineering Graduate Studies Committee (2016-2017); Department of Bioengineering Vice Chair (2018-present); Medical Scientist Training Program Committee (MSTP; 2010-present; *admission chair*, 2014-2017; *assoc. director* 2017-present); Academic Internship Program Faculty Advisory Board (AIP; 2011-2014); Sanford Consortium for Regenerative Medicine (SCRM) Space Committee (2012-2019; *chair*, 2016-2018); Engineering Medical School Liaison Council (2013-present); Academic Senate Committee on Research (2016-2019; *vice chair* 2017-2018; *chair* 2018-2019)

### TEACHING SERVICE

- **University of California, San Diego**, La Jolla, CA  
BENG 087: Freshman Seminar in Bioengineering (2012-2018); BENG 102: Molecular Components of Living Systems (2016, 2020); BENG 110: Continuum Biomechanics (2009); BENG 112B:

Biomechanics II (2009–2017, 2019); BENG 140B: Physiology (2010); BENG 192: Senior Seminar in Bioengineering (2009, 2017); BENG193: Clinical Bioengineering (2014-2020); BENG 230B: Molecular and Cell Biology (2012–2020); BENG 241B: Tissue Engineering (2011, 2013, 2015, 2017); CMM 250: Stem Cell Biology (2009–2012; 2014-2019)

- **Princeton University**, Princeton, NJ  
Molecular Biology: Seminar in Stem Cell Biology (2007)
- **University of Pennsylvania**, Philadelphia, PA (Teaching Assistanceships)  
BE 200: Introduction to Biomechanics and Biomaterials (2004 - 2005), MEAM 247: Mechanics of Materials Laboratory (2003); MEAM 211: Dynamics (2002 - 2004)

### **JOURNAL SERVICE**

- Editorial Board Memberships: Public Library of Science One (*PLoS One*) (2012 – 2017), Cells Tissues Organs (2013 – 2017), APL Bioengineering (2017 – present)
- Ad hoc reviewer: Biophysical Journal (2007 – present), Journal of Biomechanics (2007 – present), Journal of Biological Chemistry (2009), Journal of Cell Science (2008 – present), Journal of Cell Biology (2009 – present), Molecular Biology of the Cell (2009 – present), Nature Materials (2009 – present), Proc Nat Acad Sci USA (2010 – present), Cell (2015 – present), Science (2015 – present), Nature Biomedical Engineering (2018 – present)

### **GRANT REVIEWER/STUDY SECTION SERVICE**

- Ad hoc reviewer: U.S. – Israel Binational Science Foundation (2008); Netherlands Organization for Scientific Research (2008 – 2009); New Jersey Commission on Cancer Research (2009 – 2010); Engineering and Physical Sciences Research Council (UK) (2009 – 2010); National Institutes of Health, Cardiovascular Sciences Study Section (2010), Cellular Aspects of Diabetes and Obesity Study Section (CADO; 2011), Early Independence Award Study Section (2012), Cardiac Contractility, Hypertrophy, and Failure Study Section (CCHF; 2016, 2017), Cancer Tissue Engineering (2017); National Science Foundation (2012 – present)
- Study section member: American Heart Association, Basic Cell-Regenerative Cell Biology 2 (RCB2) Study Section Member (2010 - 2016); National Institutes of Health, Cardiac Contractility, Hypertrophy, and Failure Study Section (CCHF; 2018-2020); National Institutes of Health, Therapeutic Development and Pre-Clinical Studies Study Section (TDPS; 2020-2022)

### **PROFESSIONAL SOCIETY SERVICE**

- Member, American Society of Cell Biology Project 50 (2007 – present)
- Speaker, California Institute of Regenerative Medicine Stem Cell Awareness Day, High Tech High; San Diego, CA (2009)
- Guest Editor, Special Issue on “Cell Mechanobiology,” Journal of Biomechanics (2010)
- Session Chair and Organizer, “New Materials to Regulate Stem Cells,” TERMIS 2<sup>nd</sup> World Congress (2009); “Controlling Microenvironment and Cell Fate,” TERMIS NA Meeting (2010)
- Program Committee Member, 5<sup>th</sup> Biennial American Society for Matrix Biology Meeting (2010)
- Session Chair and Organizer, “Bioengineering and Mechanobiology,” American Society for Cell Biology (2011)
- Track Chair, “Stem Cell Engineering,” Biomedical Engineering Society Meeting (2013)
- Guest Editor, Special Issue on “Mechanobiology,” Progress in Molecular Biology and Translational Science (2014)
- Council Member, American Society for Matrix Biology (2015-2018)
- Guest Editor, Special Issue on “Provisional Matrix,” Matrix Biology (2017)
- Track Chair, “Biomaterials,” Biomedical Engineering Society Meeting (2018)

- Nominations Committee, Tissue Engineering Regenerative Medicine International Society-Americas (2019-2021)
- Membership Committee, Biomedical Engineering Society (2019-Present)
- Track Chair, “Tissue Engineering,” Biomedical Engineering Society Meeting (2020)