Stanford

Ovijit Chaudhuri

Professor of Mechanical Engineering and, by courtesy, of Bioengineering

Bio

BIO

Our group's research is focused at the intersection of mechanics and biology. We are interested in elucidating the underlying molecular mechanisms that give rise to the complex mechanical properties of cells, extracellular matrices, and tissues . Conversely, we are investigating how complex mechanical cues influence important biological processes such as cell division, differentiation, or cancer progression. Our approaches involve using force measurement instrumentation, such as atomic force microscopy, to exert and measure forces on materials and cells at the nanoscale, and the development of material systems for 3D cell culture that allow precise and independent manipulation of mechanical properties.

ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Professor (By courtesy), Bioengineering
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Wu Tsai Human Performance Alliance
- Faculty Fellow, Sarafan ChEM-H

ADMINISTRATIVE APPOINTMENTS

- Member, Bio-X, (2013- present)
- Assistant Professor, Department of Mechanical Engineering, (2013- present)

HONORS AND AWARDS

- CAREER Award, National Science Foundation (2019)
- Rising Star award, Biomedical Engineering Society, Cell and Molecular Bioengineering group (2019)
- MERIT award, National Cancer Institute (2018)
- Hellman Faculty Scholar, Hellman Fellows Fund (2015)
- National Academy of Engineering Frontiers in Engineering Symposium, National Academy of Engineering (2015)
- Young Faculty Award, DARPA (2014 - 2016)
- National Research Service Award, National Institutes of Health (2010 - 2013)
- National Science Foundation Graduate Fellow, National Science Foundation (2006 - 2009)
- Graduate Research Award, Biomedical Engineering Society (2006)
- National Defense Science and Engineering Graduate Fellow, American Society for Engineering Education (2003 - 2006)

- Engineering Science Departmental Citation, University of California, Berkeley (2002)
- Engineering Science Departmental Citation, University of California, Berkeley (2001)

PROFESSIONAL EDUCATION

- Postdoctoral Fellow, Harvard University , Biomaterials (2013)
- Ph.D., University of California, Berkeley and San Francisco , Bioengineering (2009)
- B.S., University of California, Berkeley , Engineering Physics (2003)

LINKS

- Group website: chaudhurilab.stanford.edu
- Google scholar site: https://scholar.google.com/citations?user=1guy5W4AAAAJ&hl=en&oi=ao

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Cells in our body live in a 3-dimensional and often squishy world. Much of what we know about cell biology is based on studies of cells cultured on petri dishes, or rigid flat sheets of plastic. However, mammalian cells in soft tissues function in 3D microenvironments, which are soft and viscoelastic, and in which cells are surrounded by neighboring cells and an extracellular matrix. Importantly, cells sense and respond to the mechanical properties and dimensionality of the microenvironment, and a 3D microenvironment can be confining, serving as a physical barrier to processes such as cell migration or division that involve shape change or growth. We are interested in elucidating the mechanics of cell-matrix interactions in soft tissues. We seek to understand how the mechanical properties of the extracellular matrix regulate processes such as breast cancer progression, stem cell differentiation, and cell division. Further, we aim to determine the biophysics of cell migration and division in confining 3D microenvironments. Our approach involves the use of engineered biomaterials for 3D cell culture and instrumentation to measure forces at the microscale relevant to cells.

Teaching

COURSES

2025-26

- Introduction to Biomechanics and Mechanobiology: BIOE 282, ME 283 (Spr)
- Introduction to Deformable Bodies: ME 80A (Aut)
- Mechanics of Materials: ME 80 (Aut)
- Mechanotransduction in Cells and Tissues: BIOE 283, BIOPHYS 244, ME 244 (Win)

2024-25

- Introduction to Biomechanics and Mechanobiology: BIOE 282, ME 283 (Spr)
- Material Behaviors and Failure Prediction: ME 152 (Win)
- Mechanotransduction in Cells and Tissues: BIOE 283, BIOPHYS 244, ME 244 (Aut)

2023-24

- Mechanotransduction in Cells and Tissues: BIOE 283, BIOPHYS 244, ME 244 (Win)

2022-23

- Biomechanical Research Symposium: ME 389 (Spr)
- Mechanics of Materials: ME 80 (Aut)
- Mechanotransduction in Cells and Tissues: BIOE 283, BIOPHYS 244, ME 244 (Win)

- The Future of Mechanical Engineering: CS 226, ME 228 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Neil Baugh, Tejas Dharmaraj, Myra Kurosu Jalil, Alice Lam, Allen Yesin, Daiyao Zhang

Postdoctoral Faculty Sponsor

Lorenza Garau Paganella, Jake Song

Doctoral Dissertation Advisor (AC)

Cole Allan, Naomi Alyafei, Liam Cotter, Alex Esclamado, Tara Eustis, Benjamin Johns, Becca Lau, Santiago Mille Fragoso, Raleigh Slyman, Peter Xie, Lucy Zhang, Junqin Zhu

Master's Program Advisor

Arya Bhadrakumar Nair, Xiangmei Chen, Alex Georgiou, XinYi Liang

Doctoral Dissertation Co-Advisor (AC)

Enquan Chew, Feven Naba

Doctoral (Program)

Cole Allan, Vidushi Bansal, Oliver Khan, Skyler St. Pierre

Publications

PUBLICATIONS

- **Monocytes use protrusive forces to generate migration paths in viscoelastic collagen-based extracellular matrices.** *Proceedings of the National Academy of Sciences of the United States of America*
  Adebowale, K., Allan, C., Ha, B., Saraswathibhatla, A., Zhu, J., Indana, D., Popescu, M. C., Demirdjian, S., Martinez, H. A., Esclamado, A., Yang, J., Bassik, M. C., Franck, et al
  2025; 122 (25): e2309772122

- **Lumen expansion is initially driven by apical actin polymerization followed by osmotic pressure in a human epiblast model.** *Cell stem cell*
  Indana, D., Zakharov, A., Lim, Y., Dunn, A. R., Bhutani, N., Shenoy, V. B., Chaudhuri, O.
  2024; 31 (5): 640-656.e8

- **Cell volume expansion and local contractility drive collective invasion of the basement membrane in breast cancer.** *Nature materials*
  Chang, J., Saraswathibhatla, A., Song, Z., Varma, S., Sanchez, C., Alyafei, N. H., Indana, D., Slyman, R., Srivastava, S., Liu, K., Bassik, M. C., Marinkovich, M. P., Hodgson, et al
  2023

- **Cell-extracellular matrix mechanotransduction in 3D.** *Nature reviews. Molecular cell biology*
  Saraswathibhatla, A., Indana, D., Chaudhuri, O.
  2023

- **The living interface between synthetic biology and biomaterial design.** *Nature materials*
  Liu, A. P., Appel, E. A., Ashby, P. D., Baker, B. M., Franco, E., Gu, L., Haynes, K., Joshi, N. S., Kloxin, A. M., Kouwer, P. H., Mittal, J., Morsut, L., Noireaux, et al
  2022; 21 (4): 390-397

- **Viscoelasticity and Adhesion Signaling in Biomaterials Control Human Pluripotent Stem Cell Morphogenesis in 3D Culture.** *Advanced materials (Deerfield Beach, Fla.)*
  Indana, D., Agarwal, P., Bhutani, N., Chaudhuri, O.
  2021: e2101966

- **Enhanced substrate stress relaxation promotes filopodia-mediated cell migration.** *Nature materials*
  Adebowale, K., Gong, Z., Hou, J. C., Wisdom, K. M., Garbett, D., Lee, H., Nam, S., Meyer, T., Odde, D. J., Shenoy, V. B., Chaudhuri, O.

2021

- **The nuclear piston activates mechanosensitive ion channels to generate cell migration paths in confining microenvironments** *SCIENCE ADVANCES*
  Lee, H., Alisafaei, F., Adebawale, K., Chang, J., Shenoy, V. B., Chaudhuri, O.
  2021; 7 (2)
- **Effects of extracellular matrix viscoelasticity on cellular behaviour.** *Nature*
  Chaudhuri, O., Cooper-White, J., Janmey, P. A., Mooney, D. J., Shenoy, V. B.
  2020; 584 (7822): 535–46
- **Matrix stiffness induces a tumorigenic phenotype in mammary epithelium through changes in chromatin accessibility.** *Nature biomedical engineering*
  Stowers, R. S., Shcherbina, A., Israeli, J., Gruber, J. J., Chang, J., Nam, S., Rabiee, A., Teruel, M. N., Snyder, M. P., Kundaje, A., Chaudhuri, O.
  2019
- **YAP-independent mechanotransduction drives breast cancer progression** *NATURE COMMUNICATIONS*
  Lee, J. Y., Chang, J. K., Dominguez, A. A., Lee, H., Nam, S., Chang, J., Varma, S., Qi, L. S., West, R. B., Chaudhuri, O.
  2019; 10
- **Volume expansion and TRPV4 activation regulate stem cell fate in three-dimensional microenvironments.** *Nature communications*
  Lee, H., Stowers, R., Chaudhuri, O.
  2019; 10 (1): 529
- **Cell cycle progression in confining microenvironments is regulated by a growth-responsive TRPV4-PI3K/Akt-p27Kip1 signaling axis.** *Science advances*
  Nam, S. n., Gupta, V. K., Lee, H. P., Lee, J. Y., Wisdom, K. M., Varma, S. n., Flaum, E. M., Davis, C. n., West, R. B., Chaudhuri, O. n.
  2019; 5 (8): eaaw6171
- **Matrix mechanical plasticity regulates cancer cell migration through confining microenvironments.** *Nature communications*
  Wisdom, K. M., Adebowale, K., Chang, J., Lee, J. Y., Nam, S., Desai, R., Rossen, N. S., Rafat, M., West, R. B., Hodgson, L., Chaudhuri, O.
  2018; 9 (1): 4144
- **Mitotic cells generate protrusive extracellular forces to divide in three-dimensional microenvironments** *NATURE PHYSICS*
  Nam, S., Chaudhuri, O.
  2018; 14 (6): 621-+
- **Mechanical confinement regulates cartilage matrix formation by chondrocytes.** *Nature materials*
  Lee, H. P., Gu, L. n., Mooney, D. J., Levenston, M. E., Chaudhuri, O. n.
  2017; 16 (12): 1243–51
- **Strain-enhanced stress relaxation impacts nonlinear elasticity in collagen gels** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Nam, S., Hu, K. H., Butte, M. J., Chaudhuri, O.
  2016; 113 (20): 5492-5497
- **Hydrogels with tunable stress relaxation regulate stem cell fate and activity** *NATURE MATERIALS*
  Chaudhuri, O., Gu, L., Klumpers, D., Darnell, M., Bencherif, S. A., Weaver, J. C., Huebsch, N., Lee, H., Lippens, E., Duda, G. N., Mooney, D. J.
  2016; 15 (3): 326-?
- **Substrate stress relaxation regulates cell spreading.** *Nature communications*
  Chaudhuri, O., Gu, L., Darnell, M., Klumpers, D., Bencherif, S. A., Weaver, J. C., Huebsch, N., Mooney, D. J.
  2015; 6: 6364-?
- **Extracellular matrix stiffness and composition jointly regulate the induction of malignant phenotypes in mammary epithelium** *NATURE MATERIALS*
  Chaudhuri, O., Koshy, S. T., da Cunha, C. B., Shin, J., Verbeke, C. S., Allison, K. H., Mooney, D. J.
  2014; 13 (10): 970-978
- **Reversible stress softening of actin networks** *NATURE*
  Chaudhuri, O., Parekh, S. H., Fletcher, D. A.

2007; 445 (7125): 295-298

- **Stress-relaxing granular bioprinting materials enable complex and uniform organoid self-organization.** *Nature materials*
  Graham, A. J., Khoo, M. W., Srivastava, V., Viragova, S., Kim, H., Parekh, K., Hennick, K. M., Bird, M., Goldhammer, N., Yu, J. Z., Hu, G., Brinkley, N. T., Pardo, et al
  2026

- **Glassy adhesion dynamics govern transitions between sub-diffusive and super-diffusive cancer cell migration on viscoelastic substrates.** *Nature communications*
  Sharma, V., Adebowale, K., Gong, Z., Chaudhuri, O., Shenoy, V. B.
  2026

- **Protocol for orthotopic implantation of a collagen hydrogel to model pancreatic ductal adenocarcinoma in mice.** *STAR protocols*
  Agolia, J. P., Xie, P. Y., Korah, M., Fallah, M., Reveron-Thornton, R. F., Guo, C., Reddy, B., Sivasubramanian, R., Longaker, M. T., Chaudhuri, O., Foster, D. S., Delitto, D.
  2026; 7 (1): 104337

- **Author Correction: Matrix viscoelasticity promotes liver cancer progression in the pre-cirrhotic liver.** *Nature*
  Fan, W., Adebowale, K., Váncza, L., Li, Y., Rabbi, M. F., Kunimoto, K., Chen, D., Mozes, G., Chiu, D. K., Li, Y., Tao, J., Wei, Y., Adeniji, et al
  2025

- **T Cells Tear Apart Confining Extracellular Matrix Via a Breaststroke-like Motion to Generate Migration Paths.** *bioRxiv : the preprint server for biology*
  Ha, B., Xie, P., Johns, B., Allan, C., Korah, M., Delitto, D., Bollyky, P., Torok, N., Chaudhuri, O.
  2025

- **Disruption of fibroblast MYD88 signaling promotes antitumor immunity in pancreatic ductal adenocarcinoma.** *Cell reports*
  Korah, M., Reveron-Thornton, R. F., Fallah, M., Xie, P. Y., Gonçalves, A., Guo, C., Agolia, J. P., Delitto, A. E., Flojo, R. A., Reddy, B., Yip, K. A., Lu, J. M., Tomasso, et al
  2025; 44 (10): 116347

- **Stress relaxing granular bioprinting materials enable complex and uniform organoid self-organization.** *bioRxiv : the preprint server for biology*
  Graham, A. J., Khoo, M. W., Srivastava, V., Viragova, S., Kim, H., Parekh, K., Hennick, K. M., Bird, M., Goldhammer, N., Yu, J. Z., Hu, G., Brinkley, N. T., Pardo, et al
  2025

- **Bioinks with varying densities of physical and chemical crosslinks modulate cellular responses in 3D by altering the viscoela-sticity of the cell microenvironment** *MATERIALS TODAY*
  Bebiano, L. B., Presa, R., Fernandes, L., Lourenco, B. N., Chaudhuri, O., Pereira, R. F.
  2025; 86: 146-161

- **Substrate stress relaxation regulates monolayer fluidity and leader cell formation for collectively migrating epithelia.** *Proceedings of the National Academy of Sciences of the United States of America*
  Charbonier, F., Zhu, J., Slyman, R., Allan, C., Chaudhuri, O.
  2025; 122 (15): e2417290122

- **Regulation of cell migration by extracellular matrix mechanics at a glance.** *Journal of cell science*
  Allan, C., Chaudhuri, O.
  2025; 138 (7)

- **Single Cell Expression Analysis of Ductal Carcinoma in Situ Identifies Complex Genotypic-Phenotypic Relationships Altering Epithelial Composition.** *Cancer research*
  Qin, X., Strand, S. H., Lee, M. R., Saraswathibhatla, A., van IJzendoorn, D. G., Zhu, C., Vennam, S., Varma, S., Hall, A., Factor, R. E., King, L., Simpson, L., Luo, et al
  2025

- **Optimized Dosing and Delivery of Bacteriophage Therapy for Chronic Wound Infections**
  Lin, Y., Dharmaraj, T., Chen, Q., Echterhof, A., Zhang, L. J., Chang, T., Pourtois, J., Liuew, C., Li, Z., Hajfathalian, M., Blankenberg, F. G., Amanatullah, D., Chaudhuri, et al
  WILEY.2025

- **Cross-Linker Architectures Impact Viscoelasticity in Dynamic Covalent Hydrogels.** *Advanced healthcare materials*
  Lin, Y. H., Lou, J., Xia, Y., Chaudhuri, O.
  2024: e2402059
- **Hydrogels for Local and Sustained Delivery of Bacteriophages to Treat Multidrug-Resistant Wound Infections.** *bioRxiv : the preprint server for biology*
  Lin, Y. H., Dharmaraj, T., Chen, Q., Echterhof, A., Manasherob, R., Zheng, L. J., de Leeuw, C., Peterson, N. A., Stannard, W., Li, Z., Hajfathalian, M., Hargil, A., Martinez, et al
  2024
- **The Influence of Crosslinker Architecture on Dynamic Covalent Hydrogel Viscoelasticity.** *bioRxiv : the preprint server for biology*
  Lin, Y. H., Lou, J., Xia, Y., Chaudhuri, O.
  2024
- **Substrate stress relaxation mediates the transition between sub-diffusive and super-diffusive migration**
  Sharma, V., Adebowale, O., Gong, Z., Chaudhuri, O., Shenoy, V. B.
  CELL PRESS.2024: 406A
- **Matrix viscoelasticity promotes liver cancer progression in the pre-cirrhotic liver.** *Nature*
  Fan, W., Adebowale, K., Váncza, L., Li, Y., Rabbi, M. F., Kunimoto, K., Chen, D., Mozes, G., Chiu, D. K., Li, Y., Tao, J., Wei, Y., Adeniji, et al
  2024
- **Getting physical: Material mechanics is an intrinsic cell cue.** *Cell stem cell*
  Atcha, H., Choi, Y. S., Chaudhuri, O., Engler, A. J.
  2023; 30 (6): 750-765
- **Engineered hydrogels for mechanobiology** *NATURE REVIEWS METHODS PRIMERS*
  Blache, U., Ford, E. M., Ha, B., Rijns, L., Chaudhuri, O., Dankers, P. Y. W., Kloxin, A. M., Snedeker, J. G., Gentleman, E.
  2022; 2 (1)
- **Engineered hydrogels for mechanobiology.** *Nature reviews. Methods primers*
  Blache, U., Ford, E. M., Ha, B., Rijns, L., Chaudhuri, O., Dankers, P. Y., Kloxin, A. M., Snedeker, J. G., Gentleman, E.
  2022; 2: 98
- **Single-Cell Transcriptomic Census of Endothelial Changes Induced by Matrix Stiffness and the Association with Atherosclerosis.** *Advanced functional materials*
  Zamani, M., Cheng, Y. H., Charbonier, F., Gupta, V. K., Mayer, A. T., Trevino, A. E., Quertermous, T., Chaudhuri, O., Cahan, P., Huang, N. F.
  2022; 32 (47)
- **EXTRACELLULAR MATRIX VISCOELASTICITY DRIVES LIVER CANCER PROGRESSION IN PRE-CIRRHOTIC NASH**
  Fan, W., Li, Y., Adebowale, K., Kunimoto, K., Mozes, G., Vancza, L., Chen, D., Chaudhuri, O., Wells, R. G., Monga, S. S., Torok, N. J.
  WILEY.2022: S98-S99
- **Single-Cell Transcriptomic Census of Endothelial Changes Induced by Matrix Stiffness and the Association with Atherosclerosis** *ADVANCED FUNCTIONAL MATERIALS*
  Zamani, M., Cheng, Y., Charbonier, F., Gupta, V., Mayer, A. T., Trevino, A. E., Quertermous, T., Chaudhuri, O., Cahan, P., Huang, N. F.
  2022
- **Nanoscale Tracking Combined with Cell-Scale Microrheology Reveals Stepwise Increases in Force Generated by Cancer Cell Protrusions.** *Nano letters*
  Sikic, L., Schulman, E., Kosklin, A., Saraswathibhatla, A., Chaudhuri, O., Pokki, J.
  2022
- **Mechanical regulation of cell-cycle progression and division.** *Trends in cell biology*
  Gupta, V. K., Chaudhuri, O.
  2022
- **Delivery of CAR-T cells in a transient injectable stimulatory hydrogel niche improves treatment of solid tumors.** *Science advances*
  Grosskopf, A. K., Labanieh, L., Klysz, D. D., Roth, G. A., Xu, P., Adebowale, O., Gale, E. C., Jons, C. K., Klich, J. H., Yan, J., Maikawa, C. L., Correa, S., Ou, et al

2022; 8 (14): eabn8264

- **The nature of cell division forces in epithelial monolayers.** *The Journal of cell biology*
  Gupta, V. K., Nam, S., Yim, D., Camuglia, J., Martin, J. L., Sanders, E. N., O'Brien, L. E., Martin, A. C., Kim, T., Chaudhuri, O.
  2021; 220 (8)
- **Transient mechanical interactions between cells and viscoelastic extracellular matrix.** *Soft matter*
  Slater, B., Li, J., Indana, D., Xie, Y., Chaudhuri, O., Kim, T.
  2021
- **Tuning Viscoelasticity in Alginate Hydrogels for 3D Cell Culture Studies.** *Current protocols*
  Charbonier, F., Indana, D., Chaudhuri, O.
  2021; 1 (5): e124
- **Magnetic probe-based microrheology reveals local softening and stiffening of 3D collagen matrices by fibroblasts.** *Biomedical microdevices*
  Pokki, J., Zisi, I., Schulman, E., Indana, D., Chaudhuri, O.
  2021; 23 (2): 27
- **Cells under pressure.** *eLife*
  Indana, D., Chaudhuri, O.
  2021; 10
- **A dysfunctional TRPV4-GSK3beta pathway prevents osteoarthritic chondrocytes from sensing changes in extracellular matrix viscoelasticity.** *Nature biomedical engineering*
  Agarwal, P., Lee, H., Smeriglio, P., Grandi, F., Goodman, S., Chaudhuri, O., Bhutani, N.
  2021
- **Modeling the tumor immune microenvironment for drug discovery using 3D culture.** *APL bioengineering*
  Lee, J. Y., Chaudhuri, O.
  2021; 5 (1): 010903
- **Cellular Pushing Forces during Mitosis Drive Mitotic Elongation in Collagen Gels.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
  Nam, S., Lin, Y. H., Kim, T., Chaudhuri, O.
  2021; 8 (4): 2000403
- **Cellular Pushing Forces during Mitosis Drive Mitotic Elongation in Collagen Gels** *ADVANCED SCIENCE*
  Nam, S., Lin, Y., Kim, T., Chaudhuri, O.
  2021
- **Epigenetic regulation of mechanotransduction.** *Nature biomedical engineering*
  Stowers, R. n., Chaudhuri, O. n.
  2021; 5 (1): 8–10
- **Relative strain is a novel predictor of aneurysmal degeneration of the thoracic aorta: An ex vivo mechanical study.** *JVS-vascular science*
  Chiu, P., Lee, H., Dalal, A. R., Koyano, T., Nguyen, M., Connolly, A. J., Chaudhuri, O., Fischbein, M. P.
  2021; 2: 235-246
- **Recursive feedback between matrix dissipation and chemo-mechanical signaling drives oscillatory growth of cancer cell invadopodia.** *Cell reports*
  Gong, Z. n., Wisdom, K. M., McEvoy, E. n., Chang, J. n., Adebowale, K. n., Price, C. C., Chaudhuri, O. n., Shenoy, V. B.
  2021; 35 (4): 109047
- **Increased Stiffness Inhibits Invadopodia Formation and Cell Migration in 3D.** *Biophysical journal*
  Chang, J., Pang, E. M., Adebowale, K., Wisdom, K. M., Chaudhuri, O.
  2020
- **Introduction to Editorial Board Member: Professor David J. Mooney** *BIOENGINEERING & TRANSLATIONAL MEDICINE*
  Chaudhuri, O.
  2020

- **Nonlinear Elastic and Inelastic Properties of Cells.** *Journal of biomechanical engineering*
  Jung, W., Li, J., Chaudhuri, O., Kim, T.
  2020
- **Multi-scale cellular engineering: From molecules to organ-on-a-chip.** *APL bioengineering*
  Huang, N. F., Chaudhuri, O. n., Cahan, P. n., Wang, A. n., Engler, A. J., Wang, Y. n., Kumar, S. n., Khademhosseini, A. n., Li, S. n.
  2020; 4 (1): 010906
- **Roles of Interactions Between Cells and Extracellular Matrices for Cell Migration and Matrix Remodeling** *MULTI-SCALE EXTRACELLULAR MATRIX MECHANICS AND MECHANOBIOLOGY*
  Li, J., Jung, W., Nam, S., Chaudhuri, O., Kim, T.
  edited by Zhang, Y.
  2020; 23: 247–82
- **Identification of cell context-dependent YAP-associated proteins reveals beta1 and beta4 integrin mediate YAP translocation independently of cell spreading.** *Scientific reports*
  Lee, J. Y., Dominguez, A. A., Nam, S., Stowers, R. S., Qi, L. S., Chaudhuri, O.
  2019; 9 (1): 17188
- **Beyond proteases: Basement membrane mechanics and cancer invasion.** *The Journal of cell biology*
  Chang, J., Chaudhuri, O.
  2019
- **The evolution of spindles and their mechanical implications for cancer metastasis.** *Cell cycle (Georgetown, Tex.)*
  Chen, Y., Nam, S., Chaudhuri, O., Huang, H.
  2019: 1–5
- **Varying PEG density to control stress relaxation in alginate-PEG hydrogels for 3D cell culture studies** *BIOMATERIALS*
  Nam, S., Stowers, R., Lou, J., Xia, Y., Chaudhuri, O.
  2019; 200: 15–24
- **Varying PEG density to control stress relaxation in alginate-PEG hydrogels for 3D cell culture studies.** *Biomaterials*
  Nam, S., Stowers, R., Lou, J., Xia, Y., Chaudhuri, O.
  2019; 200: 15–24
- **Covalent cross-linking of basement membrane-like matrices physically restricts invasive protrusions in breast cancer cells.** *Matrix biology : journal of the International Society for Matrix Biology*
  Wisdom, K. M., Indana, D. n., Chou, P. E., Desai, R. n., Kim, T. n., Chaudhuri, O. n.
  2019
- **YAP-independent mechanotransduction drives breast cancer progression.** *Nature communications*
  Lee, J. Y., Chang, J. K., Dominguez, A. A., Lee, H. P., Nam, S. n., Chang, J. n., Varma, S. n., Qi, L. S., West, R. B., Chaudhuri, O. n.
  2019; 10 (1): 1848
- **p300 and STAT3 drive YAP-independent mechanotransduction during breast cancer invasion**
  Lee, J. Y., Chang, J., Nam, S., Lee, H., Dominguez, A. A., Varma, S., Qi, L. S., West, R. B., Chaudhuri, O.
  AMER ASSOC CANCER RESEARCH.2018
- **Dynamic Hyaluronan Hydrogels with Temporally Modulated High Injectability and Stability Using a Biocompatible Catalyst.** *Advanced materials (Deerfield Beach, Fla.)*
  Lou, J., Liu, F., Lindsay, C. D., Chaudhuri, O., Heilshorn, S. C., Xia, Y.
  2018; 30 (22): e1705215
- **Matching material and cellular timescales maximizes cell spreading on viscoelastic substrates** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Gong, Z., Szczesny, S. E., Caliari, S. R., Charrier, E. E., Chaudhuri, O., Cao, X., Lin, Y., Mauck, R. L., Janmey, P. A., Burdick, J. A., Shenoy, V. B.
  2018; 115 (12): E2686–E2695
- **Regulation of Breast Cancer Progression by Extracellular Matrix Mechanics: Insights from 3D Culture Models.** *ACS biomaterials science & engineering*
  Lee, J. Y., Chaudhuri, O.

2018; 4 (2): 302-313

- **Regulation of Breast Cancer Progression by Extracellular Matrix Mechanics: Insights from 3D Culture Models** *ACS BIOMATERIALS SCIENCE & ENGINEERING*
  Lee, J. Y., Chaudhuri, O.
  2018; 4 (2): 302–13
- **Mechanisms of Plastic Deformation in Collagen Networks Induced by Cellular Forces** *BIOPHYSICAL JOURNAL*
  Ban, E., Franklin, J., Nam, S., Smith, L. R., Wang, H., Wells, R. G., Chaudhuri, O., Liphardt, J. T., Shenoy, V. B.
  2018; 114 (2): 450–61
- **Stress Relaxing Hyaluronic Acid-Collagen Hydrogels Promote Cell Spreading, Fiber Remodeling, and Focal Adhesion Formation in 3D Cell Culture** *Biomaterials*
  Lou*, J., Stowers*, R., Nam, S., Xia, Y., Chaudhuri, O.
  2018; 154: 213-222
- **Evaluation of a bioengineered construct for tissue engineering applications.** *Journal of biomedical materials research. Part B, Applied biomaterials*
  Ayala, P., Dai, E., Hawes, M., Liu, L., Chaudhuri, O., Haller, C. A., Mooney, D. J., Chaikof, E. L.
  2017
- **Stress relaxing hyaluronic acid-collagen hydrogels promote cell spreading, fiber remodeling, and focal adhesion formation in 3D cell culture.** *Biomaterials*
  Lou, J., Stowers, R., Nam, S., Xia, Y., Chaudhuri, O.
  2017; 154: 213-222
- **Viscoelastic hydrogels for 3D cell culture.** *Biomaterials science*
  Chaudhuri, O.
  2017
- **Maintenance of neural progenitor cell stemness in 3D hydrogels requires matrix remodelling.** *Nature materials*
  Madl, C. M., LeSavage, B. L., Dewi, R. E., Dinh, C. B., Stowers, R. S., Khariton, M. n., Lampe, K. J., Nguyen, D. n., Chaudhuri, O. n., Enejder, A. n., Heilshorn, S. C.
  2017; 16 (12): 1233–42
- **3D Cell Culture in Interpenetrating Networks of Alginate and rBM Matrix.** *Methods in molecular biology (Clifton, N.J.)*
  Wisdom, K. n., Chaudhuri, O. n.
  2017; 1612: 29–37
- **Viscoplasticity Enables Mechanical Remodeling of Matrix by Cells** *BIOPHYSICAL JOURNAL*
  Nam, S., Lee, J., Brownfield, D. G., Chaudhuri, O.
  2016; 111 (10): 2296-2308
- **CD44 alternative splicing in gastric cancer cells is regulated by culture dimensionality and matrix stiffness** *BIOMATERIALS*
  da Cunha, C. B., Klumpers, D. D., Koshy, S. T., Weaver, J. C., Chaudhuri, O., Seruca, R., Carneiro, F., Granja, P. L., Mooney, D. J.
  2016; 98: 152-162
- **Matrix elasticity of void-forming hydrogels controls transplanted-stem-cell-mediated bone formation** *NATURE MATERIALS*
  Huebsch, N., Lippens, E., Lee, K., Mehta, M., Koshy, S. T., Darnell, M. C., Desai, R. M., Madl, C. M., Xu, M., Zhao, X., Chaudhuri, O., Verbeke, C., Kim, et al
  2015; 14 (12): 1269-1277
- **Engineered composite fascia for stem cell therapy in tissue repair applications.** *Acta biomaterialia*
  Ayala, P., Caves, J., Dai, E., Siraj, L., Liu, L., Chaudhuri, O., Haller, C. A., Mooney, D. J., Chaikof, E. L.
  2015; 26: 1-12
- **Biological materials and molecular biomimetics - filling up the empty soft materials space for tissue engineering applications** *JOURNAL OF MATERIALS CHEMISTRY B*
  Miserez, A., Weaver, J. C., Chaudhuri, O.
  2015; 3 (1): 13-24

- **Substrate stress relaxation regulates cell spreading.** *Nature communications*
  Chaudhuri, O., Gu, L., Darnell, M., Klumpers, D., Bencherif, S. A., Weaver, J. C., Huebsch, N., Mooney, D. J.
  2015; 6: 6365-?
- **Influence of the stiffness of three-dimensional alginate/collagen-I interpenetrating networks on fibroblast biology.** *Biomaterials*
  Branco da Cunha, C., Klumpers, D. D., Li, W. A., Koshy, S. T., Weaver, J. C., Chaudhuri, O., Granja, P. L., Mooney, D. J.
  2014; 35 (32): 8927-8936
- **Oxidized alginate hydrogels for bone morphogenetic protein-2 delivery in long bone defects** *ACTA BIOMATERIALIA*
  Priddy, L. B., Chaudhuri, O., Stevens, H. Y., Krishnan, L., Uhrig, B. A., Willett, N. J., Guldberg, R. E.
  2014; 10 (10): 4390-4399
- **Highly stretchable and tough hydrogels** *NATURE*
  Sun, J., Zhao, X., Illeperuma, W. R., Chaudhuri, O., Oh, K. H., Mooney, D. J., Vlassak, J. J., Suo, Z.
  2012; 489 (7414): 133-136
- **STEM-CELL DIFFERENTIATION Anchoring cell-fate cues** *NATURE MATERIALS*
  Chaudhuri, O., Mooney, D. J.
  2012; 11 (7): 568-569
- **Actin filament curvature biases branching direction** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Risca, V. I., Wang, E. B., Chaudhuri, O., Chia, J. J., Geissler, P. L., Fletcher, D. A.
  2012; 109 (8): 2913-2918
- **Mechanics and contraction dynamics of single platelets and implications for clot stiffening** *NATURE MATERIALS*
  Lam, W. A., Chaudhuri, O., Crow, A., Webster, K. D., Li, T., Kita, A., Huang, J., Fletcher, D. A.
  2011; 10 (1): 61-66
- **Portrusive forces generated by dendritic actin networks during cell crawling** *Actin-Based Motility*
  Chaudhuri, O., Fletcher, D. A.
  El Sevier.2010: 359–379
- **Combined atomic force microscopy and side-view optical imaging for mechanical studies of cells** *NATURE METHODS*
  Chaudhuri, O., Parekh, S. H., Lam, W. A., Fletcher, D. A.
  2009; 6 (5): 383-U92
- **Differential force microscope for long time-scale biophysical measurements** *REVIEW OF SCIENTIFIC INSTRUMENTS*
  Choy, J. L., Parekh, S. H., Chaudhuri, O., Liu, A. P., Bustamante, C., Footer, M. J., Theriot, J. A., Fletcher, D. A.
  2007; 78 (4)
- **Loading history determines the velocity of actin-network growth** *NATURE CELL BIOLOGY*
  Parekh, S. H., Chaudhuri, O., Theriot, J. A., Fletcher, D. A.
  2005; 7 (12): 1219-1223