Exponent®
Engineering & Scientific Consulting

Eric Parigoris, Ph.D., P.E.

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Professional Profile

Dr. Parigoris's area of expertise lies in biomechanics, with an emphasis on how tissues respond to the application of forces. His training and education include mechanical and biomedical engineering.

Dr. Parigoris's research efforts have applied similar mechanical concepts to biological tissues as engineers do to planes, trains, and automobiles. He applies his skills and knowledge of tissue mechanics to larger scale biomechanical problems involving human injury mechanisms and tolerance. His experience includes slip, trip, and fall incidents, including falls occurring on buses, trains, and other public transportation vehicles; pedestrian-vehicle impacts; transportation-related events involving passenger vehicles and heavy trucks; occupational and recreational accidents; and the analysis of thermal injuries.

Prior to joining Exponent, Dr. Parigoris completed his doctoral studies in Biomedical Engineering at the Georgia Institute of Technology and Emory University, where he was the recipient of the NSF Graduate Research Fellowship. His doctoral research focused on the development and application of three-dimensional in vitro models to investigate disease progression and tissue mechanics in pathological states, such as breast cancer and chronic kidney disease. Dr. Parigoris also worked on the determination of the mechanical properties of model organoids, utilizing the application of continuous fluid shear stress.

Dr. Parigoris also completed a Whitaker International Fellowship at ETH Zurich, where he studied the stiffness and deformability of cancer cells, and how these mechanical considerations may aid in the early detection of cancer. Dr. Parigoris's background in cellular biomechanics also includes analyzing the role of mechanics in drug delivery systems and in biologically-based malnutrition.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, Georgia Institute of Technology, 2022

M.S., Biomedical Engineering, Georgia Institute of Technology, 2021

B.S., Mechanical Engineering, Carnegie Mellon University, 2016

National Science Foundation (NSF) Graduate Research Fellowship, 2019-2022

Whitaker International Fellowship, 2016-2017

Licenses and Certifications

Professional Engineer, Georgia, #PE055846

Professional Engineer, Texas, #160986

Northwestern University Center for Public Safety, Traffic Crash Reconstruction for Engineers

Certified English XL Tribometrist (CXLT)

Prior Experience

Graduate Research Assistant, Georgia Institute of Technology, 2018-2022

Research Assistant, ETH Zurich, 2016-2017

Undergraduate Research Assistant, Carnegie Mellon University, 2012-2016

Biotransport Teaching Assistant, Georgia Institute of Technology, 2020-2021

Mechanics of Materials Teaching Assistant, Carnegie Mellon University, 2016

Heat Transfer Teaching Assistant, Carnegie Mellon University, 2015

Professional Affiliations

American Society of Biomechanics (ASB), Member

Orthopaedic Research Society (ORS), Member

Patents

Parigoris E, Lee JH, Lee S, Metz D, Takayama S. Stably-Inverted Organoids and Methods of Producing and Using the Same. U.S. Patent 12,560,592 B2, issued February 2026.

Publications

Mertz DR, Parigoris E, Sentosa J, Lee JH, Lee S, Kleer CG, Luker G, Takayama S. Triple-negative breast cancer cells invade adipocyte/preadipocyte-encapsulating geometrically inverted mammary organoids. Integr Biol (Camb). 2023;15:zyad004.

Parigoris E, Lee JH, Liu AY, Zhao X, Takayama S. Extended longevity geometrically-inverted proximal tubule organoids. Biomaterials. 2022; 290:121828.

Ginga NJ, Slyman R, Kim GA, Parigoris E, Huang S, Yadagiri VK, Young VB, Spence JR, Takayama S. Perfusion system for modification of luminal contents of human intestinal organoids and realtime imaging analysis of microbial populations. Micromachines (Basel). 2022; 13(1):131.

Lee S, Chang J, Kang SM, Parigoris E, Lee JH, Huh YS, Takayama S. High-throughput formation and image-based analysis of basal-in mammary organoids in 384-well plates. Sci Rep. 2022; 12(1):317.

Robinson S, Parigoris E, Chang J, Hecker L, Takayama S. Contracting scars from fibrin drops. Integr Biol (Camb). 2022; 14(1):1–12.

Parigoris E, Lee S, Mertz D, Turner M, Liu AY, Sentosa J, Djomehri S, Chang HC, Luker K, Luker G, Kleer CG, Takayama S. Cancer cell invasion of mammary organoids with basal-in phenotype. Adv Healthc Mater. 2021; 10(4):e2000810.

Robinson S, Chang J, Parigoris E, Hecker L, Takayama S. Aqueous two-phase deposition and fibrinolysis of fibroblast-laden fibrin micro-scaffolds. Biofabrication. 2021; 13(3):10.1088/1758-5090/abdb85.

Parigoris E, Dunkelmann DL, Murphy A, Wili N, Kaech A, Dumrese C, Jimenez-Rojo N, Silvan U. Facile generation of giant unilamellar vesicles using polyacrylamide gels. Sci Rep. 2020;10(1):4824.

Yamanishi C, Parigoris E, Takayama S. Kinetic analysis of label-free microscale collagen gel contraction using machine learning-aided image analysis. Front Bioeng Biotechnol. 2020; 8:582602.

Parigoris E, Dunkelmann DL, Silvan U. Generation of giant unilamellar vesicles (GUVs) using polyacrylamide gels. Bio Protoc. 2020; 10(21):e3807.

Selected Presentations and Published Abstracts

Parigoris E, Takayama S. Cancer cell invasion of geometrically inverted mammary organoids with the CyBio FeliX. Society for Laboratory Automation and Screening (SLAS) 2020 Meeting. Oral presentation.

Wood AR, Justus KB, Parigoris E, LeDuc PR, Russell A. Biological inspiration from salt-exclusion in mangroves toward anti-biofouling reverse osmosis membranes. Biomedical Engineering Society (BMES) 2018 Meeting. Poster presentation. Atlanta, GA.

Parigoris E, Silvan U, Snedeker JG. Biomechanics of cancer cells: malignancy detection using mechanophenotyping tools. Oral presentation. University of Zurich. October 2017.

Wood AR, Justus KB, Parigoris E, Russell A, LeDuc PR. Biological inspiration of salt exclusion membranes in mangroves toward fouling-resistant reverse osmosis membranes. Experimental Biology 2017 Meeting. Poster presentation. Chicago, IL

Parigoris E, Justus KB, LeDuc PR. Engineering magnetically activated liposome-based drug delivery systems. American Association for the Advancement of Sciences (AAAS) 2016 Meeting. Poster presentation. Washington, DC.

Parigoris E, Justus KB, LeDuc PR. Exploring biologically based malnutrition through a gut-on-a-chip approach. Biophysical Society (BPS) 2015 Meeting. Poster presentation. Baltimore, MD.

Peer Reviews

Integrative Biology