

Exponent®
Engineering & Scientific Consulting

Gabriel Lopez Marcial, Ph.D., P.E.

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Professional Profile

Dr. López Marcial's expertise lies in the evaluation of mechanical properties for engineered tissues and medical devices, including the time-dependent mechanical responses of hydrogels. He has extensive experience with mechanical characterization techniques such as compression, indentation, and rheological testing, as well as biochemical assays for extra-cellular matrix components such as DNA, proteoglycan, and collagen content. He also has experience with 3D printing of hydrogel tissue scaffolds, native tissue dissection, and cell culture.

Prior to joining Exponent, Dr. López Marcial completed his Ph.D. work at the University of California, Berkeley, where he focused on the relationships between composition and mechanical performance in materials used for tissue engineering. Specifically, he studied the influence of initial extracellular components such as collagen on the long-term viability of agarose hydrogels as functional tissue scaffolds. He also evaluated the performance of agarose-based gels as 3D bioprinting materials through rheological, mechanical, and biochemical characterization methods.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of California, Berkeley, 2022

M.S., Mechanical Engineering, University of California, Berkeley, 2018

B.S., Mechanical Engineering, University of Puerto Rico, 2016

William S. Floyd Graduate Student Fellow, University of California, Berkeley, 2022

HSF Scholar, Hispanic Scholarship Fund, 2020

NSF Graduate Research Fellow, National Science Foundation, 2016

College of Engineering Fellow, University of California, Berkeley, 2016

Licenses and Certifications

Professional Engineer Mechanical, California, #43088

Academic Appointments

Teaching Assistant, Mechanical Engineering, UC Berkeley, 2020-2021

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Prior Experience

Graduate Student Researcher, University of California, Berkeley, 2016-2022

Undergraduate Research Fellow, University of Puerto Rico, Mayaguez, 2013-2016

Summer Scholar, Massachusetts Institute of Technology, 2015

Visiting Researcher, National Institute of Material Science (Japan), 2014

Summer Scholar, Cornell Nanoscale Facility, 2013

Professional Affiliations

Orthopaedic Research Society (ORS)

Publications

López-Marcial GR, Elango K, O'Connell GD. Addition of collagen type I in agarose created a dose-dependent effect on matrix production in engineered cartilage. Regenerative Biomaterials 2022; Volume 9, rbac048

López-Marcial, G.R.; Zeng, A.Y.; Osuna, C.; Garcia, J.M.; O'Connell, G.D. (2018) "Agarose-based Hydrogels As Suitable Bioprinting Materials" ACS Biomater. Sci. Eng. 2018, 4, 10, 3610-3616

Presentations

López-Marcial, G.R.; O'Connell, G.D. (2022) "Addition of collagen type I in agarose creates a dose-dependent effect on matrix production in engineered cartilage", Abstract for Poster presentation, Orthopaedic Research Society Annual Meeting (ORS), Tampa Convention Center, Tampa, F

Elango, K.E. López-Marcial, G.R.; O'Connell, G.D. (2020) "Towards Development Of Engineered Discs With Gradients: Mechanical Properties Of Agarose-alginate-collagen Gels", Abstract for Moderated Poster presentation, Orthopaedic Research Society Annual Meeting (ORS), Phoenix Convention Center, Phoenix, AZ

López-Marcial, G.R.; Zeng, A.Y.; Osuna, C.; Garcia, J.M.; O'Connell, G.D. (2018) "Agarose-alginate Hydrogels As Suitable Bioprinting Materials" , Poster presentation, Orthopaedic Research Society Annual Meeting (ORS), Hyatt Regency, New Orleans, LA

López-Marcial, G.R., Boussomier-Calleja, A.; Mak, M.; Kamm, R.D. (2015) "Development of a Novel Technique to Measure Local Mechanical Characteristics in Collagen Gels", Poster Presentation, MIT Annual Summer Research Programs Poster Session, Massachusetts Institute of Technology

López-Marcial, G.R.; Dávila, M.; Díaz-Rivera, R.E. (2014) "High Throughput Single Cell Electroporation with Geometrically Induced Pulses", Oral Presentation, Puerto Rico Louis Stokes Alliance for Minority Participation Junior Technical Meeting (PR-LSAMP JTM/PRISM), University of Puerto Rico-Río Piedras

López-Marcial, G.R., Namekawa, K.; Aoyagi, T. (2014) "Development of Zeolite-Based Nanofibers for the Removal of Uremic Toxins in Kidney Removal Patients", Poster and Oral Presentation, NNIN REU Convocation, Georgia Institute of Technology

López-Marcial, G.R.; Davidson, P.; Lammerding, J. (2013) "Design of a Microfluidic Device to Measure the Deformability of Cancer Cells" , Poster Presentation, Annual Biomedical Research Conference for Minority Students (ABRCMS), Nashville, TN

López-Marcial, G.R.; Díaz-Rivera, R.E. (2013) “Techniques for Single-Cell Electroporation in a Flow Through Microfluidic Device”, Poster Presentation, American Chemistry Society (ACS) Puerto Rico Local Senior Technical Meeting, Aguadilla, PR

López-Marcial, G.R.; Davidson, P.; Lammerding, J. (2013) “Design of a Microfluidic Device to Measure the Deformability of Cancer Cells”, Poster and Oral Presentation, NNIN REU Convocation, Georgia Institute of Technology

Peer Reviews

Journal of Biomechanical Engineering