

Exponent®
Engineering & Scientific Consulting

Gisselle Gonzalez, Ph.D.

Associate | Biomechanics
Irvine
+1-949-242-6067 | gonzalezg@exponent.com

Professional Profile

Dr. Gonzalez applies her expertise in tissue engineering, mechanobiology, and biomechanics to analyze human injury mechanisms. With a background in cardiac tissue engineering and soft tissue mechanics, Dr. Gonzalez applies a multidisciplinary approach to evaluate injury mechanisms and biomechanical responses in various environments, including motor vehicle, occupational, and recreational incidents.

Dr. Gonzalez has conducted extensive research in biomaterials characterization and mechanical testing, utilizing techniques such as rheology, atomic force microscopy (AFM) and scanning electron microscopy (SEM). Additionally, she has experience with high-resolution imaging techniques such as confocal imaging, traction force microscopy, and developing in-vitro models to assess cellular and tissue-level responses to stimuli. Her work has contributed to the development of engineered tissues and the role of electromechanical properties in tissue maturation. Dr. Gonzalez has presented her research at multiple interdisciplinary conferences and published first-author and co-authored articles in biomaterials and bioengineering journals.

Prior to joining Exponent, Dr. Gonzalez was a Postdoctoral Researcher and Ph.D. Candidate in Bioengineering at the University of California, San Diego. Her research focused on conductive biomaterials for cardiac tissue engineering, utilizing biomaterial platforms to enhance cardiomyocyte maturation in two-dimensional and spheroid models. Dr. Gonzalez also has experience in biotechnology entrepreneurship. As a Co-founder and Vice President of Research and Development at OxyLo, Inc., she has contributed to enzyme-loaded biomaterials for hypoxia-related applications and regulatory strategy development. Her combined expertise in bioengineering, biomechanics, and regulatory standards allows her to approach human injury assessments and product safety with a unique, interdisciplinary perspective.

Academic Credentials & Professional Honors

Ph.D., Bioengineering, University of California, San Diego, 2024

B.S., Biomedical Engineering, University of Arizona, 2019

Ruth L. Kirschstein National Research Service Award

Siebel Scholar, Class of 2024

National Science Foundation Graduate Research Fellow

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Prior Experience

Postdoctoral Research Fellow, University of California, San Diego, 2024-2025.

Vice President of Research and Development, OxyLo, Inc., 2024-2025.

Professional Affiliations

Biomedical Engineering Society (BMES)

Publications

Ren Y, De-Eknamkul C, Sun F, Ramezani M, Gonzalez G, Huang W, Wilson M, Engler AJ, Kuzum D, Cubukcu E. Trionic label-free all-optical biological voltage sensing via quantum statistics. Nature Photonics. 2025:1-9.

Nelson AC, Molley TG, Gonzalez G, Kirkland NJ, Holman AR, Masutani EM, Chi NC, Engler AJ. Vinculin haploinsufficiency impairs integrin-mediated costamere remodeling on stiffer microenvironments. Journal of Molecular and Cellular Cardiology. 2025;200:1-10.

Gonzalez G, Molley TG, LaMontagne E, Balayan A, Holman AR, Engler AJ. Conductive microfibers improve stem cell-derived cardiac spheroid maturation. Journal of Biomedical Materials Research Part A. 2025;113(1):e37856.

Gonzalez G, Nelson AC, Holman AR, Whitehead AJ, LaMontagne E, Lian R, Vatsyayan R, Dayeh SA, Engler AJ. Conductive electrospun polymer improves stem cell-derived cardiomyocyte function and maturation. Biomaterials. 2023;302:122363.

Gonzalez G, Holman AR, Nelson AC, Engler AJ. Engineering the niche to differentiate and deploy cardiovascular cells. Current Opinion in Biotechnology. 2022;74:122-128.

Presentations

Gonzalez G, Molley TG, LaMontagne E, Balayan A, Holman AR, Engler AJ. Conductive microfibers improve stem cell-derived cardiac spheroid maturation. Poster presentation, Biomedical Engineering Society Annual Meeting, Baltimore, MD. October 2024.

Gonzalez G, Nelson AC, Holman AR, Whitehead AJ, LaMontagne E, Lian R, Vatsyayan R, Dayeh SA, Engler AJ. Conductive electrospun polymer improves stem cell-derived cardiomyocyte function and maturation. Poster presentation, Biomedical Engineering Society Annual Meeting, Seattle, WA. October 2023.

Gonzalez G, Nelson AC, Holman AR, Whitehead AJ, LaMontagne E, Lian R, Vatsyayan R, Dayeh SA, Engler AJ. Conductive electrospun polymer improves stem cell-derived cardiomyocyte function and maturation. Oral presentation, Biomedical Engineering Society Annual Meeting, San Antonio, TX. October 2022.

Gonzalez G, Nelson AC, Holman AR, Whitehead AJ, LaMontagne E, Lian R, Vatsyayan R, Dayeh SA, Engler AJ. Conductive electrospun polymer improves stem cell-derived cardiomyocyte function and maturation. Oral presentation, Biomedical Engineering Society Annual Meeting, Orlando, FL. October 2021.