

Exponent®
Engineering & Scientific Consulting

Kenneth De Jesus, Ph.D.

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Professional Profile

Dr. De Jesus specializes in soft tissue and cardiovascular biomechanics, focusing on investigating injury mechanisms during incidents such as vehicle collisions, industrial accidents, equipment use and misuse, and physical interactions in occupational and recreational settings. He performs biomechanical analyses to determine the root causes of injuries, integrating principles of tissue and fluid mechanics, physiology, and product interactions. His expertise supports litigation investigations, risk assessments, accident reconstructions, and product design & development.

Dr. De Jesus earned his Ph.D. in Biomedical Engineering from the Georgia Institute of Technology & Emory University. As a Graduate Research Assistant, he led research studies on cardiovascular tissue mechanics to develop a tissue-engineered heart valve replacement while understanding the effects of shear stress and stretching under pulsatile flow conditions. He implemented 3D bioprinting technologies to create tissue models that integrated cellular and mechanical functionality, employing skills in prototyping, mechanical testing, microscopy, CAD, and data analysis to recreate native valve performance.

Dr. De Jesus is a well-versed science communicator and technical expert, who has presented his work nationally and internationally. He is also a licensed FAA Private and Remote Pilot. He has conducted research work at the Fire Research Division from the National Institute of Standards and Technology (NIST) for the development of bench-scale tests to predict real-world fire scenarios. Moreover, Dr. De Jesus has been involved in the Research & Development and Manufacturing of medical devices for companies like Ethicon Endosurgery, and Abbott Vascular. His work has contributed to the development of new products while ensuring regulatory compliance among federal and international standards.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, Georgia Institute of Technology, 2024

M.S., Biomedical Engineering, Georgia Institute of Technology, 2022

B.S., Mechanical Engineering, University of Puerto Rico, 2019

J&J GEM PhD Fellowship Award, 2022-2024

TI:GER Program (Technology Innovation: Generating Economic Results), 2022-2023

1st Place, PhD Poster Competition, National GEM Consortium Annual Board Meeting and Conference, 2022

Achievement Rewards for Academic Scientists (ARCS) Foundation Award, Georgia Institute of Technology, 2021-2024

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Hispanic Scholarship Foundation, Scholar, 2021-2024

Goizueta Foundation Fellowship, Georgia Institute of Technology, 2020-2024

National Science Foundation Graduate Research Fellowship, 2020-2023

Licenses and Certifications

FAA Private Pilot Certificate

FAA Remote Pilot Certificate

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

Prior Experience

Graduate Research Assistant, Georgia Institute of Technology & Emory University, 2019-2024

Co-op R&D Development Engineer, Ethicon Endosurgery, 2022

Co-op Manufacturing Engineer, Abbott Vascular, 2018

Summer Research Fellow, National Institute of Standards and Technology (NIST) – Fire Research Division, 2016

Professional Affiliations

Yellow Jacket Flying Club

Golden Key International Honor Society

Eta Kappa Nu (IEEE Honor Society)

Languages

English

Spanish

Publications

KJ De Jesus Morales, U Santosa, O Brazhkina, P Rajurkar, H Jo, ME Davis. Graphical abstract: A biomimetic leaflet scaffold for aortic valve remodeling. Advanced Healthcare Materials. 2024, 13(23): 2470146.

KJ De Jesus Morales, U Santosa, O Brazhkina, P Rajurkar, H Jo, ME Davis. A biomimetic leaflet scaffold for aortic valve remodeling. Advanced Healthcare Materials. 2024, 13(23): 2303972.

N Colón Carrión, N Fuentes, VA Gerena González, N Hsiao-Sánchez, L Colón-Cruz, KR De Jesús Morales, KJ De Jesús Morales, M González Morales, C Lazcano Etchebarne, MJ Ramos Benítez. +Ciencia: A training program to increase evidence-based science communication and literacy for Hispanic high school and undergraduate students. J Microbiol Biol Educ. 2024. 25(2): e00040-24.

HJ Park, KJ De Jesus Morales, S Bheri, BP Kassouf, ME Davis. Bidirectional relationship between

cardiac extracellular matrix and cardiac cells in ischemic heart disease. Stem Cells. 2021, 39(12): 1650-1659.

ALY Nachlas, S Li, BW Streeter, KJ De Jesus Morales, F Sulejmani, DI Madukauwa-David, D Bejleri, W Sun, AP Yoganathan, and ME Davis. A multilayered valve leaflet promotes cell-laden collagen type I production and aortic valve hemodynamics. Biomaterials. 2020, 240: 119838.

Presentations

KJ De Jesus Morales, U Santosa, ME Davis. 3D Bioprinting of a Biomimetic Leaflet Scaffold for Heart Valve Repair. [Presentation] 33rd Annual Conference of the European Society for Biomaterials, ESB2023. Sept 2023. Davos, Switzerland.

KJ De Jesus Morales. 3D Bioprinting a Tissue Engineered Aortic Valve. [Poster Presentation] ARCS Foundation Award Ceremony. Aug 2023. Atlanta, GA.

KJ De Jesus Morales, U Santosa, ME Davis. Tissue Engineered Aortic Valve Replacements. [Presentation] NSF-AGEP RUA Professional Conference. Sept 2022. Caltech, Pasadena, CA.

KJ De Jesus Morales, U Santosa, ME Davis. Developing a Biomimetic and Integrated Leaflet Scaffold. [Award Winner, Poster Presentation] National GEM Consortium Annual Board Meeting and Conference. Aug 2022. Phoenix, AZ.

KJ De Jesus Morales, ME Davis. 3D Bioprinting a Tissue Engineered Aortic Valve for ECM Production and Remodeling. [Presentation] Biomedical Engineering Society (BMES) Annual Meeting. Oct 2021. Orlando, FL.