Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Malito specializes in the failure analysis, mechanical behavior, and processing of engineering materials, with a particular emphasis on polymers, NiTi-based shape memory, and other alloys used in medical device development. His expertise includes fracture mechanics-based analyses.

Dr. Malito also has expertise in a wide variety of characterization techniques including, small angle x-ray scattering (SAXS), differential scanning calorimetry (DSC), scanning electron microscopy (SEM), focused ion beam (FIB), and bend free recovery (BFR). Dr. Malito draws on his wide experience, including his graduate studies at UC Berkeley, and his time as a research and development engineer in the manufacture of NiTi medical devices.

Prior to Exponent, Dr. Malito worked at Nitinol Devices and Components (now Confluent Medical) and Veniti Medical, on the manufacture, processing, development, and testing of NiTi medical devices particularly inferior vena-cava filters and stents. Dr. Malito has extensive experience with the NiTi medical device development process.

Dr. Malito completed his Ph.D. at UC Berkeley studying the deformation, yielding, and fracture of ultra-high molecular weight polyethylene (UHMWPE) used in total joint replacements. His thesis work focused foremost on critiquing and improving the methodologies for performing mechanical testing of engineering polymers especially fracture resistance using UHMWPE as the choice material, given its prolific safety-critical use. His thesis also focused on elucidating microstructural and bulk mechanical property relationships in UHMWPE. Additionally during his time at UC Berkeley, Dr. Malito served as a teaching assistant for over nine semesters teaching courses in mechanics of materials, polymer engineering, and mechanics of biomaterials.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of California, Berkeley, 2018

M.S., Mechanical Engineering, University of California, Berkeley, 2014

B.S., Biomedical Engineering, University of California, Davis, 2010

Publications

Malito, L.G., Briant, P.L., Bowers, M.L., Easley, S., Schaffer, J.E. and James, B., 2022. Fatigue, Fracture, and Crack Arrest from Bending Induced Pre-strain in Superelastic Nitinol. Shape Memory and Superelasticity, pp.1-13

Malito, L.G., Bowers, M.L., Briant, P.L., Ganot, G.S. and James, B., 2022. Fatigue Fracture of Nitinol. Journal of Failure Analysis and Prevention, 22(2), pp.441-445.

Malito LG, Sov JV, Gludovatz B, Ritchie RO, Pruitt LA. Fracture toughness of ultra-high molecular weight polyethylene: A basis for defining the crack-initiation toughness in polymers. Journal of the Mechanics and Physics of Solids 2019, 122, 435-449.

Malito LG, Arevalo S, Kozak A, Spiegelberg S, Bellare A, and Pruitt L. Material properties of ultra-high molecular weight polyethylene: Comparison of tension, compression, nanomechanics and microstructure across clinical formulations. Journal of the Mechanical Behavior of Biomedical Materials 2018, 83, 9-19.

Ansari F, Lee T, Malito L, Martin A, Gunther SB, Harmsen S, ... and Pruitt L. Analysis of severely fractured glenoid components: clinical consequences of biomechanics, design, and materials selection on implant performance. Journal of Shoulder and Elbow Surgery, 2016 25(7), 1041-1050.

Presentations

Malito L, Bellare A, Spiegelberg S, Gludovatz B, Ritchie RO, and Pruitt L. Fracture of ultra-high molecular weight polyethylene: The role of crosslinking, antioxidants and microstructure on fracture toughness. Podium presentation, 17th International Conference on Deformation, Yield and Fracture of Polymers, Kerkrade, Netherlands, 2018.

Malito L, Kozak A, Spiegelberg S, Sov JV, Watt A, Ritchie RO, and Pruitt L. Methodology for capturing mechanical properties of ultra-high molecular weight polyethylene for orthopaedic implant design. Podium presentation, 7th International Conference on the Mechanics of Biomaterials and Tissues, Waikoloa, HI, 2017.

Malito L, Kozak A, Spiegelberg S, Bellare A, and Pruitt L. Characterization methods for structure-property relationships in clinical formulations of UHMWPE. Podium presentation, 8th International UHMWPE Meeting, Torino, Italy, 2017.

Malito L, Lu L, Lee T, Gunther S, Norris T, and Pruitt L. Effect of ultra-high molecular weight polyethylene composition and radius of curvature and glenohumeral conformity in prosthetic glenoids: A retrieval study. Poster presentation, Orthopaedic Research Society, San Diego, CA, 2017.

Malito L, Bonnheim N, Ansari F, Chou S, Gunther S, Norris T, Ries M, Pruitt L. Bearing surface damage of anatomical and reverse total shoulder replacements: retrieval analysis across fixation designs and UHMWPE composition. Podium presentation, 7th International UHMWPE Meeting, Philadelphia, PA, 2015.

Book Chapters

Bowers, M, Ganot, G, Malito, L, Kondori, B, Anyanwu, E, Svedlund, F, James, B, “Failure Analysis of Medical Devices,” Analysis and Prevention of Component and Equipment Failures. ASM Handbook, Volume 11A, ASM International, 2021, p. 736 – 753