Ariel Mundo

Graduate Research Assistant
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Education

University of Arkansas, PhD. Biomedical Engineering — Expected May 2022

Universidad Rafael Landivar (Guatemala), B.S. Chemical Engineering (*cum laude*) — 2009

Research Experience

University of Arkansas

Graduate Research Assistant (University of Arkansas, Fayetteville, AR) — 2017-Present

Design and execute experiments in a murine model of colon cancer using optics (spectroscopy), molecular biology (qPCR), and imaging to longitudinally quantify changes in perfusion and angiogenesis in response to chemotherapy.

Implement Statistical semi-parametric models (generalized additive models) to analyze longitudinal data.

Other Relevant Experience

Universidad Rafael Landivar

Teaching Assistant Professor — 2016-2017

Professor of Chemistry at the Environmental and Agricultural Sciences Department
Prepared lectures, supervised labs, mentored students, wrote lab manuals

Adjunct Professor — 2013-2017

Taught Introductory Chemistry in the Engineering, Environmental and Agricultural, and Health Sciences Departments

Lacteos Balcanicos Glad

Assistant Plant Engineer — 2012

In charge of the production of the main product (yogurt, ≈ 3000 L per week). Responsible for raw material inventory, personnel management, and complete production cycle.

Publications

Journal Articles

Mundo, Ariel I., Muldoon, Timothy J. "Longitudinal examination of perfusion and angiogenesis markers in primary colorectal tumors shows distinct signatures for metronomic and maximum-tolerated dose strategies". (Preprint available in *bioRxiv*. Submitted to *Neoplasia* on Feb 2022, currently under review). Preprint: https://doi.org/10.1101/2022.02.07.479423

Mundo, Ariel I., Tipton, John R., Muldoon, Timothy J.. "Generalized additive models to analyze non-linear trends in biomedical longitudinal data using R: Beyond repeated measures ANOVA and Linear Mixed Models." (Preprint available in *bioRxiv*. First revision submitted to *Statistics in Medicine* on Jan 2022, currently under review). Preprint: https://doi.org/10.1101/2021.06.10.447970

Mundo, Ariel I., Greening, Gage, Fahr, Michael J., Hale, Lawrence N., Bullard, Elizabeth, Rajaram, Narasimhan,, and Muldoon, Timothy J. "Diffuse reflectance spectroscopy to monitor murine colorectal tumor progression and therapeutic response." *Journal of Biomedical Optics* (2020). https://doi.org/10.1117/1.JBO.25.3.035002

Greening, Gage, **Mundo, Ariel I.**, Rajaram, Narasimhan, Muldoon, Timothy J. "Sampling depth of a diffuse reflectance spectroscopy probe for *in-vivo* physiological quantification of murine subcutaneous tumor allografts". *Journal of Biomedical Optics* (2018). https://doi.org/10.1117/1.JBO.23.8.085006

Conference Presentations

Mundo, Ariel I., Muldoon, Timothy J. "Longitudinal optical and molecular quantification provides insight into the effect of different dosing strategies in colorectal cancer" *Accepted*. 2022 Biophotonics Congress: Biomedical Optics, Fort Lauderdale, FL, USA, April 2022.

Mundo, Ariel I. "Statistics and Reproducibility in Biomedical Research: Why we need both". Toronto Workshop on Reproducibility, University of Toronto, February 2022. Recording available here.

Mundo, Ariel I. "Using generalized additive models for biomedical longitudinal data. *When linear models don't work*". RMedicine 2021 Conference. Recording: https://tinyurl.com/39epnrp6 Repository (slides and data): https://aimundo.rbind.io/talks/gams-biomedical/

Mundo, Ariel I., Muhammad, Abdussaboor, and Muldoon, Timothy J. "Optical and molecular longitudinal tracking of primary colorectal murine tumors shows differences in the angiogenic response to maximum-tolerated and metronomic approaches." In Label-free Biomedical Imaging and Sensing (LBIS) 2021, vol. 11655, p. 116551C. *International Society for Optics and Photonics*, 2021. https://doi.org/10.1117/12.2576906

Mundo, Ariel I., Bullard, Elizabeth, Quinn, Kyle P., and Muldoon, Timothy J. "Optical spectroscopic and imaging biomarkers of ulcerative colitis disease progression and remission (Conference Presentation)." In Multiscale Imaging and Spectroscopy, vol. 11216, p. 1121605. *International Society for Optics and Photonics*, 2020. https://doi.org/10.1117/12.2543369

Mundo, Ariel I., Greening, Gage, and Muldoon, Timothy J. "Characterization of a multimodal endoscopically deployable veterinary spectroscopy and imaging probe to determine therapeutic response in a murine orthotopic tumor model." In Label-free Biomedical Imaging and Sensing (LBIS) 2019, vol. 10890, p. 108901L. *International Society for Optics and Photonics*, 2019.

Awards and Recognition

Professional Awareness, Advancement, and Development (PADD) Scholar 2020-2021

Received funding and participated in the PAAD program to supplement my graduate education in persuasive speaking, commercialization, and data science.

OMNI Endowed International Scholarship 2020

Granted as a scholar fulfilling the mission of the OMNI Center in Fayetteville

Fulbright Faculty Development Scholarship 2017-2019

Only two scholarships awarded for that period in the whole country

Grants

Arkansas Biosciences Institute 2021 seed grant competition 2021

Main author on a proposal submitted with Dr. Timothy J. Muldoon from the Department of Biomedical Engineering to examine gene expression and optically derived markers in a mouse model of colorectal cancer ($30,000 in funding). *Proposal scored in the top 2 of all the individual research projects for the cycle.*