Ariel Mundo

Postdoctoral Fellow
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Education

University of Arkansas, PhD. Biomedical Engineering   May 2022

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

Research Experience

Postdoctoral Fellow (University of Montreal, Montreal, QC)   July 2022-Present

Postdoctoral Fellow (University of Arkansas, Fayetteville, AR)   May 2022-July 2022

Working at the Translational Biophotonics and Imaging Laboratory in de Department of Biomedical Engineering to analyze longitudinal optical and molecular data.

Graduate Research Assistant (University of Arkansas, Fayetteville, AR)   Aug 2017- May 2022

Designed and executed experiments in an animal model of colon cancer using optics and molecular biology to longitudinally quantify changes in perfusion and gene expression in response to therapy. Implemented 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, $\approx$ 3000 L per week)

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*. Accepted in *Neoplasia* on July 2022). 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." *Statistics in Medicine* (2022). https://doi.org/10.1002/sim.9505

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

Mundo, Ariel I., Muldoon, Timothy J. "Longitudinal optical and molecular quantification provides insight into the effect of different dosing strategies in colorectal cancer". 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., Abdussaboor Muhammad, and Timothy J. Muldoon. "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., Elizabeth Bullard, Kyle P. Quinn, and Timothy J. Muldoon. "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., Gage J. Greening, and Timothy Muldoon. "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

Centre de recherches mathématiques (CRM) MfPH-CRM Postdoctoral Fellowship   July 2022

Received postdoctoral fellowship for one year to analyze public health and behavioral data (CAD 50,000)

BME Rising Scholar   June 2022

Selected by the committee of the BME Scholars Program at Washington University in St. Louis to receive mentorship about pathways and professional success in academic careers. Award included paid travel, conference attendance and honorarium.

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 (USD 1,500).

OMNI Endowed International Scholarship   2020

Granted as a scholar fulfilling the mission of the OMNI Center in Fayetteville (USD 500)

Fulbright Faculty Development Scholarship   2017-2019

Scholarship covered all costs of my PhD for the first two years. Only two scholarships awarded for that period in the whole country. (USD 78,000)

Grants

Arkansas Biosciences Institute 2021 seed grant competition   2021

Main author on a proposal co-submitted with Dr. Timothy Muldoon 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*.

Future applications

During my early postdoctoral training I plan to apply for funding opportunities at CANSSI, Mitacs, the Fields Institute, CIHR, and NSERC.