ANITA KRIZ

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EDUCATION

McGill University, Montreal, QC Canada 2023-2025
Masters of Science – Electrical Engineering
- Supervisor: Professor Tal Arbel

McGill University, Montreal, QC, Canada 2018-2023
Bachelor of Bioengineering & Minor in Applied Artificial Intelligence CGPA: 3.95/4.00
- *Dean's Honour List*

Minnechaug Regional High School, Wilbraham, Massachusetts, USA 2014-2018
High School Diploma
- Class Salutatorian

EXPERIENCE

Research Experience

Stem Cell Bioprocessing Lab, McGill University, Montreal, QC, Canada May 2022 – December 2022
NSERC-USRA Research Intern
- **Project:** Developing a microcarrier for the specific capture and proliferation of endothelial colony forming cells (ECFCs) with Professor Corinne Hoesli
- Developed protocol for the bi-functionalization of polystyrene beads based on surface chemistry to add peptides and antibodies
- Used flow cytometry, fluorescence microscopy, and ELISA's to determine surface modification success
- Implemented miniaturized bioreactors to examine effect of microcarrier on ECFCs and other cells using live imaging and fixing with fluorescence microscopy

Early Drug Discovery Unit (EDDU), The Neuro**,** McGill University, Montreal, QC, Canada August 2021 – April 2022
Research Intern
- **Project:** Comparing the phenotypes of Parkinson's disease patient derived cell lines and isogenic cell lines at different maturation points with Professor Thomas Durcan
- Implemented tissue clearing and antibody tagging to fluorescently label cells in induced-PSC 'mini-brains'
- Used cryostat sectioning to create 2D blocks of fluorescently labelled cells that can then be imaged and using fluorescent microscopy
- Implemented MATLAB codes to perform image analysis and quantifications

Biosignals & Systems Analysis Lab, McGill University, Montreal, QC, Canada May 2021- August 2021
NSERC-USRA Research Intern
- Project: Investigate the correlation between PRFs and HRFs to the underlying anatomy using susceptibility weighted imaging (SWI) data with Professor Georgios Mitsis
- Worked with FSL to perform brain extraction and binary masks for 11 subject specific SWIs
- Implemented vascular extraction using a modified vascular segmentation notebook, transferred images to MNI (standard) space, and averaged the images to obtain at atlas of the 11 subjects

Bioengineering and Advanced Materials (BEAM) Lab, *Prague, Czech Republic* June 2019 - August 2019
Research Intern
- **Project:** Functionalization and aggregation of silica nanoparticles for enzyme immobilization with Professor Miroslav Šoóš
- Researched and implemented methods of aggregating and functionalizing silica surface
- Synthesized 400 nanometer silica nanoparticles by hydrolysis and condensation and performed data analysis
- Applied microbiological laboratory methods with the use of titration, backwards titration, scanning electron microscopy (SEM) and laser diffraction particle size analyzer (Mastersizer 2000)

Teaching Experience

McGill University, Montreal, QC, Canada May 2020
Teaching Assistant and TEACH recipient
- Organized and presented one-hour tutorials daily for a class of 150 undergraduates
- Designed and explained challenging ordinary differential equation (ODE) problems clearly and concisely during tutorials
- Provided extra guidance to students who needed assistance by providing extra problems and corresponding via email

Entrepreneurial Experience

elleFA, Montreal, QC, Canada September 2022 – Present
CTO and Founder
- Developed a proof-of-concept lateral flow assay (LFA) for the detection of the physiological levels of inflammatory markers in urine for the detection of endometriosis
- Participated in the Dobson Cup and X1 Accelerator at McGill University and secured $17,500 in pre-seed funding

PUBLICATIONS

Peer Reviewed Publications

2021 Trunov, D., Muzika F., **Kriz A.,** Štětina J., Sedlářová I., Dendisová M., Hassouna F., Šoóš M. Ambient-temperature porogen-free method for preparation of silica-based macroporous materials. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*

Presentations

2023 Level, H.A., **Kriz, A**., Campeau M.A, Hoesli C. Design and in vitro validation of smart microcarriers for next generation cell culture. Cell Culture Engineering XVII. Laura A. Palomares, Instituto de Biotecnología, UNAM, Mexico. April 2023. [Poster, Oral]

2022 **Kriz, A**., Level H.A., Hoesli C. Designing Next Generation Culture Surfaces for Therapeutic Cell Bioprocessing. SURE Poster Presentation Day. McGill University, Montreal, QC, Canada. August 2022. [Poster, Oral]

AWARDS AND HONORS

Grant Awards

- FRQNT
- NSERC Undergraduate Student Research Award (USRA): $6000 (2021, 2022)
- FRQNT Academic Supplement to NSERC- USRA: $1500 (2021, 2022)

Academic Honors

- TEAM: $300 awarded for top performance in FACC 300 and for being a student mentor for the following 2 semesters (2022)
- TEACH: $300 awarded for top performance in MATH 263 and for being a teaching assistant for the course (2019)
- Top 15% in McGill Engineering (2019, 2020, 2021, 2022)

PROJECTS

Seizure Predicting Wearable Device January 2023 – April 2023

Ethics In Artificial Intelligence Course Project

- **Project:** Creating a machine learning algorithm that can accurately predict the probability of a seizure using ACC, BVP, EDA, HR, and temperature data
- Establishing a platform to alert the patient of seizure risk and communicate why the alert was triggered to make an ethically sourced device

Biologically-Inspired ML Algorithm January 2023 – April 2023

Processing in Biological Systems Course Project

- **Project**: Developing a ML model that leverages biological algorithms to create accurate classifiers in healthcare data
- Combining spiking neural networks with particle swarm optimizers and using it on readily available datasets to establish accuracy and compare it to traditional artificial neural networks

Screening Device for Endometriosis September 2022- April 2023

Capstone Project

- **Project**: Designing a lateral flow assay (LFA) for the detection of endometriosis urinary biomarkers with Professor Sebastian Wachsmann-Hogiu
- Verified a sandwich format detection of protein A1AT using two antibodies and colorimetric readout with gold nanoparticles
- Working on experiments to develop a bottom-up LFA by diminishing non-specific binding and optimizing limit of detection

LFA device for Estradiol detection November 2022- April 2023

Eli Health partnership

- Project: Designing a fluourescent LFA for the detection of low levels of estradiol in saliva
- Verified a bottom-up competitive-based LFA using europium-chalate conjugate
- Working on creating a concentration curve for the conjugate and optimizing the limit of detection

LEADERSHIP & EXTRACURRICULARS

SciGlam, Montreal, QC, Canada Januaray 2022- January 2023

Editor and Scientist Outreach Coordinator

- Find scientists with relevant papers to answer a curiosity question asked by interviewees and collaborate with them to write, edit, and publish their responses and biographies

McGill University, Montreal, QC, Canada May 2022 – December 2022

Mentor and TEAM recipient

- Supported students during the semester by tutoring answering questions during class for around 2 hours a week
- Proctored and organized exams to ensure they were run smoothly

iGEM McGill, McGill University, Montreal, QC May 2021 – June 2022

Dry Lab Team Member

- Built and improved an ODE based epidemiological (SIR) model to demonstrate the impact of the team's point of care assembled vaccine.
- Changed parameters of the model in order to simulate different epidemic conditions such as infection rate, death rate, vaccine efficacy, and amount of travel

TECHNICAL SKILLS

Languages: English (fluent) and Czech (fluent)

Programming Languages: Python, MATLAB, C, Java, and R

Scientific Libraries: NumPy, pandas, scikit-learn, TensorFlow, Keras