

# Maxwell (Max) Furman

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## EDUCATION

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**McGill University** - Montreal, QC  
B.Eng., Bioengineering  
Alma Mater Scholarship

May 2022

## RESEARCH EXPERIENCE

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**McGill University, Department of Bioengineering** - Montreal, QC

October 2018 – May 2022

*Undergraduate Researcher, Ehrlicher Lab*

- Developed mammalian cell culture substrates with active mechanical properties to probe the mechanical profile of epithelial and mesenchymal cell monolayers. Performed Traction Force Microscopy (TFM) data analysis via MATLAB.
- Cultured mammalian cells on protein micropatterns and calculated the strain energy of cellular contractile forces via MATLAB analysis. Developed a novel MATLAB algorithm for the high-throughput characterization of cellular strain energy for entire protein pattern arrays.

**Live Cell Technologies Canada (LCTC)** - Montreal, QC

May 2020 – May 2022

*Development Associate*

- McGill X-1 Startup Accelerator at the Dobson Centre for Entrepreneurship, developed the scientific and financial foundations of an emerging startup providing high-throughput cellular contractility screening

**Capstone Industry Project** – Montreal, QC

September 2021 – May 2022

*Research Associate, SMS NanoTech/Mahshid Lab*

- Designed, developed, and tested several automated antibiotic susceptibility testing (AST) device components including the inertial microfluidic separation, 3D-modeled enclosure, and Arduino-controlled heating system.
- Performed wet lab validation experiments, comparing the efficacy of bench top AST testing to the high-throughput automated device.

**McGill University, Department of Bioengineering** - Montreal, QC

May 2019 – August 2019

*Research Project Lead, SURE Program, Ehrlicher Lab*

- Sought to improve the function of the photosynthetic carbon-fixating enzyme RuBisCO through a novel method of spatially directed evolution.
- Performed the co-transformation of two plasmids into DH5 $\alpha$  E. coli to express RuBisCO and redirect metabolic activity towards atmospheric carbon fixation.

## PUBLICATIONS

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- Sutton, A., Molter, C., Amini, A., Idicula, J., **Furman, M.**, Tirgar, P., Tao, Y., Ghagre, A., Koushki, N., Khavari, A., & Ehrlicher, A. Cell Monolayer Deformation Microscopy reveals mechanical fragility of cell monolayers in the epithelial to mesenchymal transition. *Biophysical Journal*. 121(4):629-643, 2022