

Fred Sunstrum

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EDUCATION

Bachelor of Computer Science (BCS)

University of British Columbia

Sep. 2023 – Aug. 2025

Vancouver, BC

MSc. Genome Science and Technology

University of British Columbia

May. 2019 – Nov 2021

Vancouver, BC

BSc. Biology, Minor in Statistics

University of Ottawa

Aug. 2014 – Dec 2018

Ottawa, ON

EXPERIENCE

Research Methodologist II

University of Ottawa Heart Institute - Cardiovascular Research Methods Center

Feb. 2021 – Aug 2023

Ottawa, ON

- Developed a web scraper in R to retrieve clinical trial data.
- Led the analysis and writing of systematic literature reviews on stem cell treatments for COVID-19 and autoimmune disorders.
- Performed reference screening, data extraction, risk-of-bias analysis, drafted protocol registrations, and manuscripts for peer-reviewed publication.

Graduate Research Assistant

University of British Columbia - Michael Smith Laboratories

May. 2019 – Dec 2021

Vancouver, BC

- Discovered genes involved in biosynthesis of an anti-diabetic plant compound (MbA) and used metabolic engineering to produce MbA in wild tobacco.
- Mined a time-series transcriptomic dataset to identify candidate genes.
- Improved MbA yields 10x in engineered wild tobacco by expressing genes involved in precursor biosynthesis.
- Improved precursor availability 20x through metabolic engineering.
- Published thesis findings in peer-reviewed journals.

PROJECTS

WORDLE clone | Java, Java Swing, IntelliJ, JSON

Sept 2023 – Present

- Developed a WORDLE clone in Java, using including word generation, comparison, and robust input handling.
- Created a GUI using Java Swing and used JSON for saving user progress.
- Applied Object Oriented Programming principles and test-driven development.

The Last Laugh | Godot Game Engine, GDScript

Jan 2023 – Present

- Worked as a team to create a 2D platformer game using the Godot game engine.
- Implemented projectile flight and collision mechanics triggering animations.

SELECTED PUBLICATIONS

Sunstrum, Frederick G., Bekele, W. A., Wight, C. P., Yan, W., Chen, Y., & Tinker, N. A. (2019). A genetic linkage map in southern-by-spring oat identifies multiple quantitative trait loci for adaptation and rust resistance. *Plant Breeding*, 138(1), 82–94. <https://doi.org/https://doi.org/10.1111/pbr.12666>

Kruse, L. H., **Sunstrum, Frederick G.**, Garcia, D., López Pérez, G., Jancsik, S., Bohlmann, J., & Irmisch, S. (2024). Improved production of the antidiabetic metabolite montbretin a in nicotiana benthamiana: Discovery, characterization, and use of crocosmia shikimate shunt genes. *The Plant Journal*, 117(3), 766–785. <https://doi.org/https://doi.org/10.1111/tpj.16528>

Sunstrum, Frederick G., Liu, H. L., Jancsik, S., Madilao, L. L., Bohlmann, J., & Irmisch, S. (2021). 4-coumaroyl-coa ligases in the biosynthesis of the anti-diabetic metabolite montbretin a. *PLOS ONE*, 16(10), 1–18. <https://doi.org/10.1371/journal.pone.0257478>

TECHNICAL SKILLS

Languages: R, C/C++, Java, GDScript

Frameworks/Tools: Git, RStudio, ggplot2, IntelliJ, JUnit, VS Code