

# Timothy Liao

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## SKILLS

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**Bioinformatics:** Biopython, Pymol, NCBI BLAST, Galaxy

**Languages:** Python, SQL, R

**Developer Tools:** Git, VS Code, Visual Studio, PyCharm, Jupyter Notebooks, Google Colab

**Cloud Technologies and Data Processing:** Google Cloud Platform (GCP), Google BigQuery, Apache Beam

**Data Science Libraries:** pandas, NumPy, Matplotlib, scikit-learn, Plotly

**Molecular Biology:** CRISPR/Cas9 gene editing, recombinant DNA cloning, site-saturation mutagenesis, DNA sequencing analysis, high-throughput library construction, assay development, ELISA

## EXPERIENCE

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### Software Engineer II – Bioinformatics

July 2022 - January 2024

*BenchSci (Scinapsis Analytics Inc.)*

*Toronto, ON (remote)*

- Developed and maintained ETL/ELT data processing for ingestion and normalization of various diverse external databases
- Evaluated external third party data sources in support of company objectives and assessed quality of data by employing data exploration and visualization tools
- Implemented robust data quality checks within ETL/ELT workflows to ensure accuracy, consistency, and completeness of processed data
- Engineered effective data models and schemas to support data integrity and facilitate seamless integration with downstream applications

### Associate Scientist II *formerly Associate Scientist I*

Nov 2020 - July 2022

*Hyasynth Biologicals Inc.*

*Montréal, QC*

- *Formerly Associate Scientist I, Research Associate II, Research Associate I*
- Engineered several key enzymes for improved functions using high-throughput workflows culminating in 2 patent applications
- Developed computational methods for high-volume protein engineering assay data analysis
- Established bioinformatic methods for analysis of next-generation sequencing data
- Strengthened company's IP portfolio by preparation of patent applications
- Led protein engineering initiatives requiring coordination across several junior researchers and weekly communications with stakeholders

### Research Associate II *formerly Research Associate I*

May 2018 - Nov 2020

*Hyasynth Biologicals Inc.*

*Montréal, QC*

- Demonstrated cannabinoid drug production in a heterologous expression system
- Optimized protocols for high-throughput construction of mutant libraries
- Developed high-throughput enzyme assays that were used for protein engineering studies

### Graduate Researcher

Jan 2014 - May 2016

*Molecular Genetics, University of Toronto*

*Toronto, ON*

- Produced photoreceptors and RPE cells from mammalian retinal stem cells using molecular signalling to direct differentiation in mammalian cell culture

### Undergraduate Researcher

May 2011 - Aug 2013

*Biological Sciences, Genetics, University of Manitoba*

*Winnipeg, MB*

- Completed Honours thesis characterizing UV-damaged DNA repair in *Arabidopsis thaliana* by analyzing protein interactions using various molecular biology techniques

## EDUCATION

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### McGill University

*Master of Science (Applied), Biotechnology*

Montreal, QC

2017 – 2019

### University of Manitoba

*Bachelor of Science (Honours), Genetics*

Winnipeg, MB

2009 – 2013

## PATENTS

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Liao, T. S., Song, L., Hom, L., Curtis, W., Furlong, D., Melgar, M., & Bhargava, D. (2022, May). *Olivetolic acid cyclase variants with improved activity for use in production of phytocannabinoids* (WO2022104460A1). <https://patents.google.com/patent/WO2022104460A1>

Song, L., Liao, T. S., Walton, C., Hom, L., Melgar, M., Furlong, D., Bhargava, D., Palys, S., & Bourgeois, L. (2022, May). *Cannabidiolic acid synthase variants with improved activity for use in production of phytocannabinoids* (WO 2022104460A1). <https://patents.google.com/patent/WO2022104468A1>

## PUBLICATIONS

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Ly, V., Collister, D. T., Fonseca, E., Liao, T. S., & Schroeder, D. F. (2015). Light and cop1 regulate level of overexpressed det1 protein. *Plant Science*, 231, 114–123. <https://doi.org/https://doi.org/10.1016/j.plantsci.2014.11.011>

## HONOURS AND AWARDS

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- CIHR Frederick Banting and Charles Best 2015-2016  
*Canada Graduate Scholarship – Master’s level*
- The Stella Zegas-Dunn Graduate Fellowship in Vision Science 2014–2015, 2015 - 2016  
*Vision Science Research Program*
- NSERC CREATE in M3 Scholarship 2014 - 2015
- Faculty of Science Undergraduate Research Award Summer 2011, 2012, 2013
- University of Manitoba Merit Award 2012 - 2013
- University of Manitoba Student Union Scholarship 2012 - 2013
- First Class Dean’s Honour List 2009 - 2013