

Mark Pampuch

Researcher and Data Scientist — Citizenship: Canadian — Current Location: Toronto, Ontario, Canada
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SUMMARY

I am a benchtop scientist turned computational biologist, possessing expertise in multiple disciplines, including biology, biochemistry, computer science, bioinformatics, and large-scale data analysis. I am a self-motivated and collaborative individual who seamlessly integrates into diverse settings. With a detail-oriented and driven personality, I have a proven ability to meet deadlines in fast-paced environments. My productivity is reflected in my contributions to two publications and presentations at nine scientific conferences. Additionally, I am trilingual, capable of speaking in English, French, and Polish, and possess strong communication skills. I am seeking a position in a dynamic and collaborative environment where I can apply my skills and expertise to solve complex problems in biology or data science.

RESEARCH INTERESTS

Biology, Bioinformatics, Data Science, Biochemistry, Genetics, Next Generation Sequencing, Synthetic Biology, Bioengineering

EDUCATION

The University of Western Ontario , London, Ontario, Canada	September 2021 — August 2023
Master of Science in Biochemistry	Cumulative GPA: 4.0/4.0
Thesis Title: Advances in <i>Phaeodactylum tricornutum</i> Nuclear Genome Engineering	

The University of Western Ontario , London, Ontario, Canada	September 2016 — April 2020
Bachelor of Science in Biology, Honours Specialization in Genetics	Cumulative GPA: 3.7/4.0
Undergraduate Thesis Title: Shaping the Root: Assessing a Dose-dependent Role for the <i>Lotus japonicus</i> <i>HAR1</i> Receptor Kinase Gene	

PROFESSIONAL EXPERIENCE

King Abdullah University of Science and Technology	Thuwal, Makkah, Saudi Arabia
<i>Visiting Researcher</i>	September 2023 — December 2023
Developing high-molecular weight DNA extraction protocols on photosynthetic microbes	
Cell culture characterization using high-performance liquid chromatography	
Performing next-generation sequencing using Oxford Nanopore Technologies platforms	
Analyzing next-generation sequencing data using Bash, R, and Python	
Distributing computational loads over high-performance computing clusters in parallel using SLURM and Nextflow for timely processing of large data	

Agriculture and Agrifood Canada	London, Ontario, Canada
<i>Research Assistant</i>	May 2019 — August 2019
Culturing and maintenance of plant tissue	
Genetic sequence analysis for potential CRISPR cut sites	
Designing guide RNA's and genotyping primers	
DNA Isolation from plant tissue and genotyping via PCR	
Phenotyping using brightfield microscopy	
RNA Isolation and quantitative PCR for gene expression level analysis	

MolecuLight Inc.	MaRS Discovery District, Toronto, Ontario, Canada
<i>Internship</i>	May 2018 — August 2018
Collecting and processing data from clinical trial report forms	
Analyzing microbial composition data obtained from clinical samples	
Performing market research involving data collection and client profiling of hospitals across North America and Europe	
Performing literature reviews and reports on topics related to microbiology and healthcare economics	
Analyzing competitors in the medical or healthcare industry to gain insights into their products, strategies, and market positioning	

PROJECTS

Sequencing a Living Library of KSA Microorganisms

Visiting Researcher

Thuwal, Makkah, Saudi Arabia

September 2023 — December 2023

Developing **high-molecular weight DNA extraction** protocols on photosynthetic microbes
 Cell culture characterization using **high-performance liquid chromatography**
 Performing **next-generation sequencing** using Oxford Nanopore Technologies platforms
 Analyzing next-generation sequencing data using **Bash, R, and Python**
 Distributing computational loads over **high-performance computing clusters** in parallel
 using **SLURM** and **Nextflow** for timely processing of large data

Remapping *Phaeodactylum tricornutum* Genomic Data

Graduate Student Researcher

London, Ontario, Canada

January 2022 — June 2023

Curating and **tidying data** from various online databases
Developing scripts and **algorithms** to filter genome-scale mapping data
Uploading and **hosting** genomic data on remote server

Optimizing *Phaeodactylum tricornutum* Nuclear Genome Engineering

Graduate Student Researcher

London, Ontario, Canada

January 2022 — April 2023

Culturing and **maintenance** of algal, yeast, and bacterial cell cultures
 Optimizing **electroporation** protocols for marine diatoms
 Performing **next-generation sequencing** of transformant lines

Directed Evolution of Conjugative Plasmids

Graduate Student Researcher

London, Ontario, Canada

September 2021 — December 2021

Designing and **executing** laboratory evolution experiment
Genetic transformation of laboratory *E. coli* strains
 Performing precise and meticulous **bacterial conjugation** experiments

Assessing Dose-dependent effects in the *Lotus japonicus HAR1* Locus

Undergraduate Student Researcher

London, Ontario, Canada

September 2019 — March 2020

DNA Isolation from plant tissue and genotyping via **PCR**
 Phenotyping using **brightfield microscopy**
RNA Isolation and **quantitative PCR** for gene expression level analysis

Engineering QTL's in Legume Species using CRISPR/Cas Technologies

Summer Research Assistant

London, Ontario, Canada

May 2019 — August 2019

Culturing and **maintenance** of plant tissue
Genetic sequence analysis for potential CRISPR cut sites
 Designing guide RNA's and genotyping primers

PUBLICATIONS

Walker, E. J. L., **Pampuch, M.**, Chang, N., Cochrane, R. R., and Karas, B. J. (2023) Design and Assembly of the 117-kb *Phaeodactylum tricornutum* Chloroplast Genome. Plant Physiology. <https://doi.org/10.1093/plphys/kiad670>

Pampuch, M., Walker, E. J. L., and Karas, B. J. (2021) Towards Synthetic Diatoms: The *Phaeodactylum tricornutum* Pt-syn1.0 Project. Current Opinion in Green and Sustainable Chemistry. <https://doi.org/10.1016/j.cogsc.2022.100611>

PRESENTATIONS

Fostering International Collaborations for Algal Biotechnology

SynDiatoms Fall 2023 Workshop — Speaker

Webinar

October 2023

Advances in *Phaeodactylum tricornutum* Nuclear Genome Engineering

International Conference on Algal Biomass, Biofuels and Bioproducts — Speaker

Waikōloa Beach, Hawaii, USA

June 2023

Advances in *Phaeodactylum tricornutum* Nuclear Genome Engineering

SynDiatoms Spring 2023 Workshop — Speaker

Webinar

May 2023

Advances in *Phaeodactylum tricornutum* Nuclear Genome Engineering

Graduate Research Spring Symposium — Speaker

London, Ontario, Canada

May 2023

Genetic Engineering Advances in Diatoms
2023 Bioenergy Conference — Speaker

Webinar
January 2023

Optimizing Transformation Methods for *Phaeodactylum tricornutum*
SynDiatoms 2022 Workshop — Speaker

Webinar
December 2022

Towards Synthetic Diatoms: The Pt-Syn 1.0 Project

Canada SynBio 2022 — Speaker & Poster

Video: <https://www.linkedin.com/feed/update/urn:li:activity:6938749677995470848/>

Toronto, Ontario, Canada
May 2022

Towards Synthetic Diatoms

Graduate Research Winter Symposium — Poster

London, Ontario, Canada
January 2022

Assessing a Dose-dependent Role for the *Lotus japonicus HAR1* Locus

Ontario Biology Day — Speaker

Hamilton, Ontario, Canada
Scheduled but cancelled due to COVID-19

WORKSHOPS

An Introduction to Machine Learning for Oxford Nanopore Data

Entailed building a DNA basecaller using HMM's and a variant caller using a CNN.

Manhattan, New York, USA
December 2022

AWARDS

Chair's Travel Award

\$500 — Issued by the Schulich School of Medicine & Dentistry Biochemistry Department

London, Ontario, Canada
June 2023

Canada Graduate Scholarships – Master's Program

\$17,500 — Issued by the Natural Sciences and Engineering Research Council of Canada (NSERC)

Canada
September 2022

Ontario Graduate Scholarship

\$15,000 — Issued by the Government of Ontario

Awarded but declined due to conflict with NSERC award

Ontario, Canada
September 2022

Ontario Graduate Scholarship

\$15,000 — Issued by the Government of Ontario

Ontario, Canada
September 2021

British Columbia Graduate Scholarship

\$15,000 — Issued by the Government of British Columbia

British Columbia, Canada
September 2020

Deans Honour List (x4)

Issued by the University of Western Ontario

London, Ontario, Canada
2016 — 2020

Western Scholarship of Distinction

\$1000 — Issued by the University of Western Ontario

London, Ontario, Canada
September 2016

EXTRACURRICULAR INVOLVEMENTS

Seed Your Startup 2023 Semi-Finalist

Morrisette Institute for Entrepreneurship

Created a business plan and presented a pitch for a biotechnology start-up company

Semi-finalist amongst one other student “co-founder” in university-wide competition

London, Ontario, Canada
March 2023

2023 Ivey Business Plan Competition Semi-Finalist

Ivey Business School

Created a business plan and presented pitches for a biotechnology start-up company

Semi-finalist amongst one other student “co-founder” in Canada/USA-wide competition

London, Ontario, Canada
November 2022 — January 2023

Exhibit Organizer

Science Rendezvous

Role entailed engaging with local youth and promoting science

Organized booths on behalf of the Western University biochemistry department

London, Ontario, Canada
July 2022, May 2023

Community Representative

Western Biochemistry Graduate Student Association

Role entailed promoting science and the Western University biochemistry department in the local community

Organized donation drive in partnership with Diabetes Canada

Organized youth outreach exhibit in partnership with Science Rendezvous

London, Ontario, Canada

September 2021 — August 2023

Competition Judge

cGEM

Judge for national biotechnology competition in Canada

Online

October 2021

Writer/Researcher

Western University Technology Review

Role entailed writing about sustainability initiatives in the local community

London, Ontario, Canada

September 2018 — April 2019

SKILLS

Programming: Python, R, Bash/Linux Shell, JavaScript, SQL, L^AT_EX

Technologies: Nextflow, Snakemake, SLURM, Docker, Singularity, Anaconda, Git

Software: Visual Studio Code, RStudio, Microsoft Excel, IGV, Geneious, Benchling, SnapGene

Soft Skills: Problem Solving, Creativity, Time Management, Teamwork, Public Speaking

LANGUAGES

English (Native)

Speaking — *Fluent*

Listening — *Fluent*

Reading — *Fluent*

Writing — *Fluent*

French

Speaking — *Limited*

Listening — *Limited*

Reading — *Proficient*

Writing — *Intermediate*

Polish

Speaking — *Proficient*

Listening — *Proficient*

Reading — *Limited*

Writing — *Basic*

CERTIFICATIONS

edX Verified Certificate for CS50's Introduction to Computer Science

Issued by HarvardX — Credential ID: b2f0e720dcab45dabf14307458bffba8

REFERENCES

Prof. Kyle J. Lauersen

Assistant Professor, Bioengineering, King Abdullah University of Science and Technology — Thuwal, Makkah, Saudi Arabia

E-mail: kyle.lauersen@kaust.edu.sa

Scholar Profiles: KAUST - Personal Page — Google Scholar — LinkedIn

Prof. Bogumil Karas

Assistant Professor, Department of Biochemistry, University of Western Ontario — London, Ontario, Canada

E-mail: bkaras@uwo.ca

Scholar Profiles: University of Western Ontario - Personal Page — Google Scholar — LinkedIn

Prof. Krzysztof Szczyglowski

Research Scientist, London Research and Development Centre, Agriculture and AgriFood Canada — London, Ontario, Canada

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Scholar Profiles: AAFC - Personal Page — LinkedIn

Prof. Ralph DaCosta

Founder/CSO, MolecuLight & Assistant Professor, Medical Biophysics, University of Toronto — Toronto, Ontario, Canada

E-mail: rdacosta@uhnres.utoronto.ca

Scholar Profiles: University of Toronto - Personal Page — LinkedIn