Jeffrey Boschman

Graduate Research Assistant, *Artificial Intelligence in Medicine (AIM) Lab @ UBC*

Areas of Expertise

Machine Learning |Visual Computing |GMP Pharmaceuticals |Engineering Risk Assessments

Education

MASc, Biomedical Engineering Sept 2019-Dec 2021
The University of British Columbia *Vancouver, Canada*

- GPA: 4.29/4.33
- Engineers in Scrubs (EiS) Program

BASc, Chemical and Biological Engineering Sept 2012-May 2017
The University of British Columbia *Vancouver, Canada*

- GPA: 3.85/4.33
- With Distinction
- With Co-operative Education Program

Awards

Dean's Award ($150)	2017
Design and Innovation Award ($150)	2017
Sherman Chen Scholarship in Chemical Engineering ($3,920)	2016
Dorothy and Arthur Holt Scholarship ($450)	2016
BIOMOD 1st Place Audience Choice Award	2015
BIOMOD Silver Project Award	2015
Go Global International Learning Programs Award ($1,000)	2015

Research Experience

Graduate Research Assistant May 2020-Dec 2021
The Artificial Intelligence in Medicine (AIM) Lab @ UBC *Vancouver, Canada*

- Supervisor: Ali Bashashati, PhD
- Led a study comparing color normalization pre-processing algorithms on digital histopathology slides for improved machine learning-based cancer diagnosis

- Currently improving deep learning-based diagnosis of ovarian epithelial carcinoma subtypes

Graduate Student Sept 2019-April 2020
Engineers in Scrubs program *Vancouver, Canada*

- Supervisor: Roger Tam, PhD
- Clinical Advisor: Ryan Flannigan, MD
- Developed medical device prototype to improve the accessibility and decrease the mobility of plaque to facilitate more accurate injections in treating Peyronie's disease

Work Experience

Research and Development Intern May-Aug 2019
New Beta Innovation Ltd. *Hong Kong, Hong Kong Special Administrative Region*

- Achieved 60% increase in volumetric yield of a recombinant *E. coli* fermentation product by optimizing 2L bioreactor conditions
- Ensured purity and enzymatic activity using techniques such as inclusion bodies extraction, SDS-Page, and activity assays

Production Technician Oct 2017-Dec 2018
New Beta Innovation Ltd. *Burnaby, Canada*

- Conducted engineering trial runs for optimizing aseptic production and filling of a haemoglobin-based pharmaceutical on a commercial batch scale with a five-day turnaround schedule
- Authored and executed validation documents and protocols (URS, DQ, IQ, OQ, PQ, etc) for equipment on-boarding and GMP readiness and developed standard operating procedures for various production operations
- Led formal risk assessment (FMEA) on equipment installation in Grade A environment as subject matter expert
- Qualified in cleanroom control techniques such as aseptic filling, Grade B gowning, cleaning, and material and personnel flow
- Put in charge of training new technicians, volunteered to take Level 2 Occupational First Aid to keep others safe on night shifts, and managed the production department's reporting of the environmental management system (EMS)

Fermentation Engineer Jan-Sept 2017
The Biofoundry *Vancouver, Canada*

- Recommissioned two 40L bioreactors by evaluating fluid lines and control systems, identifying outdated equipment, systematically troubleshooting, and formulating new operating procedures
- Improved efficiency of culturing bacteria by writing standard operating procedures for 2L bioreactor and managing its operation

- Optimized bioreactor conditions for growth by collecting samples for 24hours under different aeration conditions

Pilot Plant Intern Jan-July 2016
Carbon Engineering Ltd. *Squamish, Canada*

- Redesigned fluidized bed pellet reactor by analyzing flaws in previous models, examining ways to improve ease of use, researching optimal materials to fit design, and making equipment modifications
- Optimized input variables for pellet growth by constructing two 20ft tall reactors and conducting 24-36hour tests
- Quantified pellet growth and attrition by analyzing 6-20 total suspended solids, pH, and pellet size distribution samples per day, improved data collection by remodeling Excel sheet, and authored report to summarize results

Laboratory/Workshop Assistant May-Aug 2015
Department of Chemical and Biological Engineering (CHBE) *Vancouver, Canada*

- Streamlined workplace by organizing laboratory, workshop, and basement storage and disassembling broken equipment using plasma torch, grinder saw, and oxyacetylene torch
- Built new equipment for undergraduate labs involving thermodynamics and fuel cells, and fixed older experiments involving biological wastewater treatment and particle characterization

Technician May-Dec 2014
Maxxam Analytics *Burnaby, Canada*

- Ensured clients received accurate, timely results by efficiently managing up to 300 samples per day while accounting for RUSH samples, making new reagents with back-titration, and technical reporting
- Mastered and taught other co-op students ~15 analytical procedures, including solids analysis, soil pH measurement, and UV/Vis spectrophotometry to quantify sulfides, Cr6+, tannins, lignin, and chlorophyll
- Managed two stations for one month each, incurring the responsibilities of a full-time employee, troubleshooting by reviewing older procedures, and getting audited by a major client

Publications

Chan, K. Y. T., Zhao, C., Siren, E. M. J., Chan, J. C. Y., **Boschman, J.**, & Kastrup, C. J. (2016). "Adhesion of blood clots can be enhanced when copolymerized with a macromer that is cross-linked by coagulation factor XIIIa". **Biomacromolecules**, 17(6), 2248–2252. http://doi.org/10.1021/acs.biomac.6b00481

Oral Presentations

Boschman, J., (2021, June). "Improving Deep Learning Models for Clinical Epithelial Ovarian Carcinoma Whole Slide Pathology Image Classification Using Color Normalization", *BME-AI Monthly Research Exchange,* Virtual

Boschman, J., Brown, J., Levschuk, A., Werschler, N., (2020, April). "Local Traction to Facilitate Accurate Injection of Xiaflex for Peyronie's Disease", *Engineers in Scrubs 2020*, Vancouver, BC

Fu, D., **Boschman, J.**, Chan, N., Co, I., Fegen, A., Luvalle-Burke, I., Shahali, A. (2015, October). "DNA origami, gold nanoparticle and liposome drug delivery system enabling simultaneous and triggered release", *BIOMOD 2015 Competition*, Boston, MA

Poster Presentations

Boschman, J., Farahani, H., Farnell, D., Jones, S. J. M., Huntsman, D. G., Gilks, C. B., Bashashati, A. (2021, May). "The Utility of Color Normalization for Artificial Intelligence-Based Diagnosis of Hematoxylin and Eosin-Stained Pathology Images", *UBC Pathology Day 2021*, Virtual

Amiri, A., **Boschman, J.**, Yadav, V. G., Scaman, C., Rahim, R. A., Yada, R. Y., Mohamad, R. (2017, July). "Optimal Hemin Stimulation for Maximizing Lactococcus lactis Biomass Production under Respiration Conditions in Batch Cultivation", *2017 BIO World Congress on Industrial Biotechnology*, Montreal, QC

Apduhan, M., **Boschman, J.**, Chan, N., Chin, B., Co, I., Goertsen, D. (2017, March). "Industrial Scale Production of Biocompatible Polyhydroxybutyrate (PHB) Using Apoptosis-regulated Recombinant Escherichia coli", *UBC Applied Science Design Day*, Vancouver, BC

Skills

Machine learning

- Currently improving deep learning-based diagnosis of ovarian epithelial carcinoma subtypes (*The Artificial Intelligence in Medicine (AIM) Lab @ UBC*)

Visual computing

- Led a study comparing color normalization pre-processing algorithms on digital histopathology whole slide images for improved machine learning-based cancer diagnosis (*The Artificial Intelligence in Medicine (AIM) Lab @ UBC*)

Good Manufacturing Practices (GMP) pharmaceuticals

- Conducted engineering trial runs for optimizing aseptic production and filling of a haemoglobin-based pharmaceutical on a commercial batch scale with a five-day turnaround schedule (*New Beta Innovation Ltd.)*
- Authored and executed validation documents and protocols (URS, DQ, IQ, OQ, PQ, etc) for equipment on-boarding and GMP readiness and developed standard operating procedures for various production operations (*New Beta Innovation Ltd.)*
- Qualified in cleanroom control techniques such as aseptic filling, Grade B gowning, cleaning, and material and personnel flow (*New Beta Innovation Ltd.)*

Engineering Risk Assessments

- Led formal risk assessment (FMEA) on equipment installation in Grade A environment as subject matter expert (*New Beta Innovation Ltd.)*
- Corrected 11 extremely dangerous hazards and 178 safety deficiencies by conducting 22 laboratory safety inspections (*CHBE/CERC Safety Committee*)

Teaching and Mentorship

Graduate Teaching Assistant Sept-Dec 2020
The University of British Columbia *Vancouver, Canada*

- Statistical Methods for Evaluating Medical Technologies

Elementary School Science Educator May 2017-April 2018
Let's Talk Science / CHBE *Vancouver, Canada*

Committee Membership and Leadership

Trainee Education Committee April 2021-Dec 2021
Gynecological Cancer Initiative (GCI) Trainee *British Columbia, Canada*

- Helped build and support academic, professional development, and mental health initiatives for GCI trainees

Undergraduate Safety Committee Representative Sept 2016-Sept 2017
CHBE/CERC Safety Committee *Vancouver, Canada*

- Corrected 11 extremely dangerous hazards and 178 safety deficiencies by conducting 22 laboratory safety inspections

Voluntary Work

Homeless Shelter Volunteer Oct 2017-Feb 2020

Union Gospel Mission *Vancouver, Canada*

Construction and Farming Volunteer Feb-May 2019
WWOOF Japan *Fujinomiya, Ishigaki, and Kasumigaura, Japan*

Recreational Program Volunteer Oct 2017-Jan 2019
Burnaby General Hospital - Fellburn Care Center *Burnaby, Canada*

Undergraduate Research Assistant Feb-Aug 2015
Kastrup Lab *Vancouver, Canada*

Hobbies

Calisthenics | Running | Cooking with my cast iron pan (Loonardo DiCastironio) | Video editing

References

Ali Bashashati, PhD
Hossein Farahani, PhD
Roger Tam, PhD
Chad Pickel