# Christopher Hughes

chughes@bccrc.ca
Nationality: Canadian
Google Scholar Citations

2477 Carolina Street, Unit 303
V5T 0G8 Vancouver, Canada
LinkedIn Profile

I am a trained biochemist with extensive experience working in the life and clinical sciences fields using a wide array of molecular biology, sequencing, proteomics, metabolomics, and bioinformatics technologies. I strive to acquire a position that will enable me to apply my knowledge and expertise towards facilitating impactful studies that influence our knowledge of public health and complex diseases. In addition, I am increasingly driven to understand and implement ways to better translate research and scientific knowledge to be easily communicated and understood by both my colleagues and the general public.

I obtained my PhD at the University of Western Ontario working with Dr. Gilles Lajoie where I studied the interactions of human embryonic stem cells with their extracellular matrix environment using a combination of proteomic and molecular biology approaches. Upon completion of my PhD, I began a prestigious Interdisciplinary EIPOD fellowship at the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany where I studied the dynamics of gene expression control in steady-state and stress conditions in the labs of Drs. Jeroen Krijgsveld and Lars Steinmetz using a combination of transcriptomics and proteomics approaches. After my time at EMBL, I pursued an exciting opportunity as the Proteomics Platform Manager in the Genome Sciences Centre (GSC) within BC Cancer. The Proteomics Platform at the GSC is a core facility providing a wide range of mass spectrometry and related wet- and dry-lab services for a diverse collection of basic and clinical researchers both within the institute and across Canada. My primary role in this position included project conception, technical development, funding acquisition, project management, data analysis, and the overall provision of high-quality service to a diverse crowd of researchers. When I joined the GSC, the Proteomics Platform was largely unestablished and serviced only a few individuals who were familiar with the technology. Shortly after joining, we had set up and optimized multiple routines for reliable data acquisition, standardized pipelines for data processing, laid out extensive cost models and logging tools for recapture of funds, built collaborative relationships with other researchers and industry, published peer-reviewed literature based on the clinical applications of our work, and acquired grant funding for instrumentation and research. As a result of these efforts and outreach, the core now operates as a self-sustaining operation servicing a large user-base. After success in this manager position and in pursuit of a new challenge, I transitioned to a Staff Scientist and Mass Spectrometry Service Specialist position in the group of Dr. Poul Sorensen at the British Columbia Cancer Agency. In this senior role I am able to conceive, pursue funding for, and execute projects that currently relate to the study of different aspects of transcriptional and translational control of cellular phenotype in bone and childhood cancers. Aside from allowing me to apply my wet- and dry-lab skills to research projects relevant to my interests, this role has given me valuable experience relating to project and student management and grant acquisition from a supervisory viewpoint.

I have attached my curriculum vitae for your consideration following this letter.

# Christopher Hughes

chughes@bccrc.ca
Nationality: Canadian
Google Scholar Citations
GitHub

2477 Carolina Street, Unit 303
V5T 0G8 Vancouver, Canada
LinkedIn Profile

## Relevant Skills

### Research and Leadership Abilities

- Extensive experience with all aspects of the development of a mass spectrometry core facility from a basal level, including: instrument acquisition, maintenance, repair, and optimization; protocol optimization and SOP development; day-to-day project management for a large and diverse customer base; construction of cost models and financial management; preparation of applications to pursue funding initiatives.
- Skilled in the application of proteomics, metabolomics, DNA/RNA sequencing, and other technologies (e.g. microscopy, flow cytometry, mass cytometry, molecular biology methods) towards the study of complex biological systems.
- Expertise in the use bioinformatic languages, such as R, Python, and C#, for the analysis of NGS, proteomics, and metabolomics data, and software development. Proficient with Adobe Illustrator for the creation of high quality figures and rich schematics.
- Extensive experience transitioning project ideas and preliminary findings into complete applications for granting agencies, such as CIHR, CFI, NSERC, CRS, and NIH.

## Current Role

2018-present | **Staff Scientist and Mass Spectrometry Service Specialist**
BC Cancer

In this role with Dr. Poul Sorensen, my primary responsibilities include:

- Independent conception, development, funding acquisition, execution, and supervision of studies examining mechanisms of cancer cell adaptation mediated by modification of mRNA translation, specifically targeting the RNA-binding protein YB-1. Studying the oncogenic properties of Ewing sarcoma with a specific focus on patterns in the expression of transcript and protein isoforms specific to this cancer type, with additional effort focused on the putative tumour suppressor, DLG2.

## Selected Publications

2021 Zhang, H., **Hughes, C.S.** *et al*, Proteomic screens for suppressors of anoikis identify IL1RAP as a promising surface target in Ewing sarcoma *Cancer Discovery.* PMID: 34021002

2019 **Hughes, C.S.**, Sorensen, P.H., Morin, G.B. A Standardized and Reproducible Proteomics Protocol for Bottom-up Quantitative Analysis of Protein Samples using SP3 and Mass Spectrometry *Methods in Mol. Biol.*. PMID: 30852816

2019 **Hughes, C.S.**, Moggridge, S., Mueller, T., Sorensen, P.H., Morin, G.B., Krijgsveld, J. Single-pot, Solid-phase-enhanced Sample Preparation for Proteomics Experiments *Nature Protocols.* PMID: 30464214

2019 Kovalchik, K.A., Colborne, S., Spencer, S., Sorensen, P.H., Chen, D.D.Y., Morin, G.B., **Hughes, C.S.**$^{\diamond}$, RawTools: Rapid and Dynamic Interrogration of Orbitrap Data Files for Mass Spectrometer System Management *J. Prot. Res.*. PMID: 30462513

2018 Moggridge, S., Sorensen, P.H., Morin, G.B., **Hughes, C.S.**$^{\diamond}$ Extending the Compatibility of the SP3 Paramagnetic Processing Approach for Proteomics *J. Prot. Res.*. PMID: 29565595

2018 **Hughes, C.S.**, Morin, G. Using Public Data for Comparative Proteome Analysis in Precision Medicine Studies *Proteomics.* PMID: 28887829

2017 **Hughes, C.S.**, Spicer, V., Krokhin, O.V., Morin, G.B., Investigating Acquisition Performance on the Orbitrap Fusion When Using Tandem MS/MS/MS Scanning with Isobaric Tags *J. Prot. Res.*. PMID: 28418257

2017 **Hughes, C.S.**, Zhu, C., Spicer, V., Krokhin, O.V., Morin, G. Evaluating the Characteristics of Reporter Ion Signal Acquired in the Orbitrap Analyzer for Isobaric Mass Tag Proteome Quantification Experiments *J. Prot. Res.*. PMID: 28418254

2016 **Hughes, C.S.**, McConechy, M., Cochrane, D., Nazeran, T., Karnezis, A., Huntsman, D., Morin, G. Biomarker Discovery from High Resolution Proteomic Analysis of Fixed Ovarian Tumor Tissue Samples. *Scientific Reports.* PMID: 27713570

2014 **Hughes, C.S.**, Foehr, S., Garfield, D., Furlong, E.E., Steinmetz, L.M., Krijgsveld, J. Ultrasensitive proteome analysis using paramagnetic bead technology. *Molecular Systems Biology.* PMID: 25358341

2012 **Hughes,C.S.** and Krijgsveld, J. Developments in quantitative mass spectrometry for the analysis of proteome dynamics. *Trends in Biotechnology.* PMID: 23107010

2012 **Hughes, C.S.** *et al.* Mass spectrometry-based proteomic analysis of the matrix microenvironment in pluripotent stem cell culture. *Mol. Cell. Prot.*. PMID: 23023296

$\diamond$ - denotes senior authorship.

## Selected Education and Professional Experience

2014–2018 Group Leader, **British Columbia Genome Sciences Centre**

Managed the mass spectrometry Proteomics Platform. Involved the development, execution, analysis, and management of research projects utilizing proteomics in a diverse array of clinical experimental models, from large-scale patient cohort profiling to precision medicine clinical cancer trials. Development and optimization of protocols and SOPs for a wide variety of sample analysis types that cater to the facility user base. Management of administrative and financial aspects of the core facility. Preparation of grant applications for funding to acquire new equipment, support research, and other technical development projects.

2012–2014 Post-Doctoral Researcher, **European Molecular Biology Laboratory**

Performed integrative studies that utilize genomics, transcriptomics, and proteomics to study dynamic molecular systems.

## Selected Grants and Awards

2022 **Title:** Examining onco-fusion-driven expression of transcript and protein isoforms that underpin fitness relationships essential for Ewing sarcoma tumor formation, **Agency:** Sarcoma Foundation of America, **Role:** co-applicant

2021 **Title:** Ewing sarcoma progression and spreading are controlled by selected protein production events that are regulated by modified forms of the YB-1 oncoprotein, **Agency:** MGI, **Role:** co-applicant

2016 **Title:** Fixed tissue proteomics (FTP) applied to create a pragmatic clinical decision aid for endometrial cancer, **Agency:** CCSRI, **Role:** co-applicant

2016 **Title:** Breast cancer classification and marker identification by comprehensive proteomic analysis, **Agency:** CBCF, **Role:** co-applicant

2016 **Title:** High-resolution analysis of phenotypic fitness using genome-wide CRISPR editing coupled to quantitative mass spectrometry, **Agency:** BCPN, **Role:** co-applicant

## Patents

2014 **Title:** Proteomic sample preparation using paramagnetic beads

**Inventors: Hughes, C.S.***, Krijgsveld, J., Steinmetz, L.

**Publication number:** WO2015118152A1, US20170074869A1, CA2938907A1, EP3102612A1

**Filing date:** 2015-02-09

* - denotes majority inventor

## Selected Presentations

| | |
|---|---|
| Poster | CCRC 2019 **Title:** A subcellular atlas of translation machinery reveals novel roles for the RNA binding protein YB-1 |
| Oral | Personalized Oncogenomics Clinical Research Session 2016 **Title:** Proteomics and Metabolomics in Personalized Oncogenomics |
| Oral | BCPN 2016 **Title:** High Resolution Proteomic Analysis of Ovarian FFPE Tumour Tissues using TMT-MS3 on an Orbitrap Fusion for Clinical Research |
| Poster | ASMS 2015 **Title:** Enhanced processing of FFPE tissue for clinical proteomics using SP3 |
| Poster | ASMS 2014 **Title:** Single-tube sample preparation workflows for Ultra-sensitive Proteomics |
| Oral | Nordic Proteomics Meeting 2014 **Title:** Single-tube sample preparation workflows for Ultra-sensitive Proteomics |
| Poster | Proteostasis Discussion 2013 **Title:** Studying the dynamics of proteome homeostasis using Hyperplexed mass spectrometry |

## References

Additional references available upon request.

**Dr. Poul Sorensen**
*British Columbia Cancer Agency, Vancouver, Canada*
Role: Senior Scientist
Email: psorensen@bccrc.ca
Phone: +1 604-675-8202
Relationship: Current supervisor

**Dr. Jeroen Krijgsveld**
*German Cancer Research Centre, Heidelberg, Germany*
Role: Group leader, Proteomics of Stem Cells and Cancer
Email: j.krijgsveld@dkfz-heidelberg.de
Phone: +49 06221 421720
Relationship: Post-doctoral supervisor

**Dr. Gilles Lajoie**
*Western University, London, Canada*
Role: Group leader and head of Proteomics Core Facility
Email: galajoie@gmail.com
Phone: +1 519-661-3054 ext.83054
Relationship: Ph.D. supervisor