

Christopher Hughes

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Nationality: Canadian

[Google Scholar Citations](#)

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Relevant Skills

Research and Leadership Abilities

- Experienced in the initial setup, administration, day-to-day management, as well as the communication, training, and outreach aspects of a mass spectrometry core facility catering to a wide range of individuals.
- Highly skilled in the application of DNA/RNA sequencing, proteomics, and metabolomics technologies towards the study of complex biological systems in basic and clinical research settings.
- Extensive experience using software tools such as R, Python, and Adobe Illustrator for data analysis and visualization.
- Considerable knowledge in the conception and transition of project ideas and preliminary findings into applications for granting agencies, navigating both academic and government policies.
- Skilled in the development, management, and execution of small and large scale research projects comprising individuals or collaborative teams of researchers working towards completion of set aims.

Current Role

2018-present

Staff Scientist and Mass Spectrometry Service Specialist
British Columbia Cancer Research Centre

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

- Independent conception, development, grant acquisition, execution, and supervision of studies examining the dynamics of protein translation at a sub-cellular level in cancer, with specific sub-studies focused on elucidating the mechanistic roles of targets using combinations of molecular biology, sequencing, proteomics, metabolomics, microscopy, and bioinformatic techniques.
- Participation in pan-Canada and global research projects involving the Sorensen lab, including experimental conception and design, data acquisition and analysis, grant acquisition, and student supervision.

Selected Publications

- 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.**[◊], RawTools: Rapid and Dynamic Interrogation of Orbitrap Data Files for Mass Spectrometer System Management *J. Prot. Res.* PMID: 30462513
- 2018 Kovalchik, K.A., Moggridge, S., Chen, D.D.Y., Morin, G.B., **Hughes, C.S.**[◊] Parsing and Quantification of Raw Orbitrap Mass Spectrometer Data using RawQuant *J. Prot. Res.* PMID: 29682972
- 2018 Moggridge, S., Sorensen, P.H., Morin, G.B., **Hughes, C.S.**[◊] 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
- 2017 Tien, J.F., Mazloomian, A., Cheng, S.G., **Hughes, C.S.** *et al.* CDK12 regulates alternative last exon mRNA splicing and promotes breast cancer cell invasion *Nucleic Acids Res.* PMID:28334900
- 2017 Funnell, T., Tasaki, S., Oloumi, A., Araki, S., Kong, E., Yap, D., Nakayama, Y., **Hughes, C.S.** *et al.* CLK-dependent exon recognition and conjoined gene formation revealed with a novel small molecule inhibitor *Nat. Commun.* PMID: 28232751
- 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
- 2016 Virant-Klun, I., Leicht, S., **Hughes, C.S.**, Krijgsveld, J. Identification of maturation-specific proteins by single-cell proteomics of human oocytes. *Mol. Cell. Proteomics* PMID: 27215607

2016	Gupta, I., Villanyi, Z., Kassem, S., Hughes, C.S. , Panasenکو, O.O., Steinmetz, L.M., Collart, M.A. Translational Capacity of a Cell is Determined during Transcription Elongation via the Ccr4-Not Complex. <i>Cell Reports</i> PMID: 27184853
2014	Hughes, C.S. , Foehr, S., Garfield, D., Furlong, E.E., Steinmetz, L.M., Krijgsveld, J. Ultrasensitive proteome analysis using paramagnetic bead technology. <i>Molecular Systems Biology</i> . PMID: 25358341
2014	Radan, L., Hughes, C.S. <i>et al.</i> Microenvironmental regulation of telomerase isoforms in human embryonic stem cells. <i>Stem Cells Dev.</i> . PMID: 24749509
2012	Hughes, C.S. and Krijgsveld, J. Developments in quantitative mass spectrometry for the analysis of proteome dynamics. <i>Trends in Biotechnology</i> . PMID: 23107010
2012	Hughes, C.S. <i>et al.</i> Mass spectrometry-based proteomic analysis of the matrix microenvironment in pluripotent stem cell culture. <i>Mol. Cell. Prot.</i> . PMID: 23023296
2011	Hughes, C.S. <i>et al.</i> Proteomic analysis of extracellular matrices used in stem cell culture. <i>Proteomics</i> . PMID: 21834137
2010	Hughes, C.S. <i>et al.</i> Matrigel: A complex protein mixture required for optimal growth of cell culture. <i>Proteomics</i> . PMID: 20162561
2009	Bendall, S.C., Hughes, C.S. <i>et al.</i> An enhanced mass spectrometry approach reveals human embryonic stem cell growth factors in culture. <i>Mol. Cell. Prot.</i> . PMID: 18936058
2008	Bendall, S.C.*, Hughes, C.S.* <i>et al.</i> Prevention of amino acid conversion in SILAC experiments with embryonic stem cells. <i>Mol. Cell. Prot.</i> . PMID: 18487603

* - denotes co-first authorship.

◊ - denotes senior authorship.

Patents

2014	<p>Title: Proteomic sample preparation using paramagnetic beads</p> <p>Inventors: Hughes, C.S.*, Krijgsveld, J., Steinmetz, L.</p> <p>Publication number: WO2015118152A1, US20170074869A1, CA2938907A1, EP3102612A1</p> <p>Filing date: 2015-02-09</p> <p>* - denotes majority inventor</p>
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Selected Grants and Awards

2019	Title: Small equipment acquisition - Biocomp sucrose gradient profiler fluorescence reader, Agency: BCCF, Role: co-applicant
2018	Title: Small equipment acquisition - Agilent HPLC, Agency: BCCF, 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
2016	Title: Small equipment acquisition - Bioruptor Pico sonicator, Agency: BCCF, Role: co-applicant
2016	Title: Small equipment acquisition - Sutter laser capillary puller, Agency: BCCF, Role: co-applicant
2014	European Interdisciplinary Post-Doctoral Fellowship

Selected Presentations

Poster	Canadian Cancer Research Conference 2019 Title: A subcellular atlas of mRNA translation machinery reveals a novel role 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
Poster	ISSCR 2011 Title: Proteomic Analysis of the Human Embryonic Stem Cell Depositome
Poster	HUPO 2010 Title: Matrigel: A complex mixture required for optimal growth of cell culture

Post-Doctoral Experience

2012–2014	EIPOD Post-Doctoral Researcher European Molecular Biology Laboratory I worked in the groups of Drs. Jeroen Krijgsveld and Lars Steinmetz towards a goal of performing integrative studies that utilize genomics, transcriptomics, and proteomics to study dynamic molecular systems. From these projects we achieved: <ul style="list-style-type: none">• Invention of an enhanced platform for unbiased and universal proteomics sample handling in conventional and ultra-sensitive applications, leading to the first reported screen of single-<i>Drosophila</i> embryos across developmental stages.• In-depth insight into the multi-layered regulation of cellular phenotype making use of protein turnover data acquired across a population of >200 individual yeast segregants.
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Professional Experience

2014–2018	Group Leader and Proteomics Platform Manager British Columbia Genome Sciences Centre 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. Administrative and technical management of the proteomics core facility, including training, employee management, and funding acquisition.
2006–2006	Research Technician Merck Frosst Canada Worked on validating a new mass spectrometer ion source based on thermal desorption.
2006–2006	Research Technician Radient Technologies Inc. Worked on projects related to utilizing large-scale strategies to purify active compounds from natural products.
2004–2005	Research Technician MDS Sciex Worked on projects related to profiling carcinogenic food dyes and excipient analysis of analgesic drugs.

Selected Education and Professional Development

2007–2012	PhD in Biochemistry, Western University, Canada Thesis title: Proteomics of Human Stem Cell Derived Matrices
2002–2007	Honors Bachelor of Science in Biology, University of Waterloo, Canada
2013–2013	Next-generation Sequencing Workshop, European Bioinformatics Institute, UK
2013–2013	Introduction to Python, EMBL, Germany
2013–2013	Introduction to MATLAB and image analysis, EMBL, Germany

References

Additional references available upon request.

Dr. Poul Sorensen

British Columbia Cancer Agency, Vancouver, Canada

Role: Senior Scientist

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Relationship: Current supervisor

Dr. Gregg Morin

British Columbia Cancer Agency, Vancouver, Canada

Role: Head of Proteomics

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Relationship: Previous supervisor

Dr. Jeroen Krijgsveld

German Cancer Research Centre, Heidelberg, Germany

Role: Group leader, Proteomics of Stem Cells and Cancer

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Relationship: Post-doctoral supervisor

Dr. Gilles Lajoie

Western University, London, Canada

Role: Group leader and head of Proteomics Core Facility

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Phone: +1 519-661-3054 ext.83054

Relationship: Ph.D. supervisor