Lunenfeld-Tanenbaum Research Institute
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Academic Degrees

PhD Cellular and Molecular Medicine, University of Ottawa, 2011
BA   English and History, University of York (United Kingdom), 2005
BSc Biology and Mathematics, McMaster University, 2002

Research Experience

Bioinformatician   **Lunenfeld-Tanenbaum Research Institute**
September 2015-present   Toronto, Ontario, Canada
Supervisor: Dr. Anne-Claude Gingras
- Develop computational software for proteomics users to aid data analysis and visualization
- Generate web resources for the management, analysis and distribution of proteomics data
- Create web tools for the mass spectrometry facility to aid data management and instrument quality control

Postdoctoral Fellow   **Lunenfeld-Tanenbaum Research Institute**
September 2011-2015   Toronto, Ontario, Canada
Supervisor: Dr. Anne-Claude Gingras
- Studied cerebral cavernous malformations, a vascular disease of the central nervous system
- Identified novel interactors and functions for the three CCM proteins that cause genetic forms of this disease
- Generated a large protein-interaction network for CCM and related proteins that covers multiple cell types and organisms
- Developed computation tools for the visualization of proteomics data

PhD Thesis   **Ottawa Hospital Research Institute**
September 2005-August 2011   Ottawa, Ontario, Canada
Supervisor: Dr. Rashmi Kothary
- Characterized, through computational approaches, the structural heterogeneity that exists within the protein kinase superfamily
- Discovered structural water molecule conversation across the kinase superfamily
- Developed a technique for kinase-substrate finding that allows for the substrates of a kinase to be specifically determined from any cell type of interest

Summer Student   **McMaster University**
May-August 2002, August-September 2003   Hamilton, Ontario, Canada
Supervisor: Dr. David J. D. Earn
- Studied the effects of migration between isolated organism populations using individual-based

and population-based computer models

Summer Student   **University of York**
June-August 2003   York, UK
Supervisor: Dr. Jon W. Pitchford
- Developed a mathematical model for a non-equilibrium soil food-web and explored the effects of system dynamics and spatial heterogeneity as part of a wider national research program involving soil biodiversity

Undergraduate Thesis   **McMaster University**
September 2001-April 2002   Hamilton, Ontario, Canada
Supervisor: Dr. G. Brian Golding
- Developed a mathematical algorithm for detecting functional divergence between homologous protein sequences

Summer Student   **McMaster University**
May-August 2000, May-August 2001   Hamilton, Ontario, Canada
Supervisor: Dr. G. Brian Golding
- Worked on quantifying amino acid substitution rate heterogeneity at the structural protein level across large phylogenetic trees

Awards

2015	Travel award to attend Human Proteome Organization World Congress Awarding Body: Canadian National Proteomics Network
2015	TD Bank Health Research Fellowship at the LTRI *Awarding Body*: Lunenfeld-Tanenbaum Research Institute
2012-2014	Postdoctoral Research Fellowship *Awarding Body*: Heart and Stroke Foundation of Canada
2011	Faculty of Graduate and Postdoctoral Studies Dean's Scholarship *Awarding Body*: University of Ottawa
2009-2011	Vanier Canada Graduate Scholarship *Awarding Body*: Canadian Institutes of Health Research
2006-2009	Canada Research Studentship *Awarding Body*: Multiple Sclerosis Society of Canada
2005-2011	Excellence Scholarship *Awarding Body*: University of Ottawa
2005	Canada Graduate Scholarship Master's award

Awarding Body: Canadian Institutes of Health Research

2002   Undergraduate Student Research Award
              Awarding Body: National Science and Engineering Research Council
              For research to be undertaken with the supervision of Dr David Earn

2001   The George P. and Leatha M. Keys Scholarship
              Awarding Body: McMaster University
              Awarded for outstanding achievement in Honours Mathematics

2001   The Herbert A. Ricker Scholarship
              Awarding Body: McMaster University
              Awarded for scholarship and character in Science

2001   Undergraduate Student Research Award
              Awarding Body: National Science and Engineering Research Council
              For research to be undertaken with the supervision of Dr Brian Golding

2000   Senate Scholarship
              Awarding Body: McMaster University

2000   Undergraduate Student Research Award
              Awarding Body: National Science and Engineering Research Council
              For research to be undertaken with the supervision of Dr Brian Golding

1998   Science Incentive Scholarship
              Awarding Body: McMaster University

Publications

First Authored

1. Knight JDR, Samavarchi-Tehrani P and Gingras AC (In preparation). Gene Info: a Chrome extension for retrieving gene information on any website.

2. Knight JDR, Choi H, Gupta G, Pelletier L, Raught B, Nesvizhskii AI and Gingras AC (2017). ProHits-viz: a suite of web-tools for visualizing interaction proteomics data. *Nature Methods*, 14:645-646.

3. Knight JDR, Liu G, Zhang JP, Pasculescu A, Choi H and Gingras AC (2015). A web-tool for visualizing quantitative protein-protein interaction data. *Proteomics*, 15:1432-1436.

4. Knight JDR, Pawson T and Gingras AC (2013). Profiling the kinome: current capabilities and future challenges. *Journal of Proteomics*, 81:43-55.

5. Knight JDR and Kothary R (2012). The extracellular kinome. *Kinome*, 1:1-3.

6. Knight JDR, Tian R, Lee REC, Wang F, Beauvais A, Zou H, Megeney LA, Gingras AC, Pawson T, Figeys D and Kothary R (2012). A novel whole-cell lysate kinase assay identifies substrates of the p38 MAPK in differentiating myoblasts. *Skeletal Muscle*, 2:5.

7. Knight JDR and Kothary R (2011). The myogenic kinome: protein kinases critical to mammalian skeletal myogenesis. *Skeletal Muscle*, 1:29.

8. Knight JDR, Hamelberg D, McCammon JA and Kothary R (2009). The role of conserved water molecules in the catalytic domain of protein kinases. *Proteins: Structure, Function, and Bioinformatics*, 76:527-535.

9. Knight JDR, Qian B, Baker D and Kothary R (2007). Conservation, variability and the modeling of active protein kinases. *PLoS ONE*, 2:e982.

Co-Authored

10. Lambert JP, Picaud S, Fujisawa T, Hou H, Savitsky P, Uusküla-Reimand L, Gupta G, Abdouni H, Lin Z-Y, Tucholska M, Knight JDR, Gonzalez-Badillo B, St-Denis N, Newman J, Stucki M, Pelletier L, Bandeira N, Wilson M, Filippakopoulos P and Gingras AC (2018). Interactome rewiring following pharmacological targeting of BET bromodomains. *Molecular Cell*, DOI: https://doi.org/10.1016/j.molcel.2018.11.006.

11. Youn JY, Dunham WH, Hong SJ, Knight JDR, Chen GI, Bagci H, Bashkurov M, Rathod B, MacLeod G, Eng SWM, Angers S, Morris Q, Fabian M, Côté JF and Gingras AC (2018). High-density proximity mapping reveals the subcellular organization of mRNA-associated granules and bodies. *Molecular Cell*, 69:517-532.

12. Couzens AL, Xiong S, Knight JDR, Mao DY, Guettler S, Picaud S, Kurinov I, Filippakopoulos P, Sicheri F and Gingras AC (2017). MOB1 mediated phospho-recognition in the core mammalian Hippo pathway. *Molecular and Cellular Proteomics*, 16:1098-1110.

13. St-Denis N, Gupta GD, Lin ZY, Gonzalez-Badillo B, Veri AO, Knight JDR, Rajendran D, Couzens AL, Currie KW, Tkach JM, Cheung SWT, Pelletier L and Gingras AC (2016). Phenotypic and interaction profiling of the human phosphatases identifies diverse mitotic regulators. *Cell Reports*, 17: 2488-2501.

14. Liu G, Knight JDR, Zhang JP, Tsou CC, Wang J, Lambert JP, Larsen B, Tyers M, Raught B, Bandeira N, Nesvizhskii A, Choi H and Gingras AC (2016). Data Independent Acquisition analysis in ProHits 4.0. *J Proteomics*, 149: 64-68.

15. Teo G, Koh H, Fermin D, Lambert JP, Knight JDR, Gingras AC and Choi HW (2016). SAINTq: Scoring protein-protein interactions in affinity purification – mass spectrometry experiments with fragment or peptide intensity data. *Proteomics*, 16: 15-16.

16. De Kreuk BJ, Gingras AR, <u>Knight JDR</u>, Liu JJ, Gingras AC and Ginsberg MH (2016). Heart of Glass Anchors Rasip1 at Endothelial Cell-Cell Junctions to Support Vascular Integrity. *eLife*, 5: e11394.

17. Gupta GD, Coyaud É, Gonçalves J, Mojarad BA, Liu Y, Wu Q, Gheiratmand L, Comartin D, Tkach JM, Cheung SW, Bashkurov M, Hasegan M, <u>Knight JD</u>, Lin ZY, Schueler M, Hildebrandt F, Moffat J, Gingras AC, Raught B and Pelletier L (2015). A dynamic protein interaction landscape of the human centrosome-cilium interface. *Cell*, 163: 1484-99.

18. Wang J, Tucholska M, <u>Knight JDR</u>, Lambert JP, Larsen B, Tate S, Gingras AC and Bandeira N (2015). MSPLIT-DIA: Sensitive peptide identification for data-independent acquisition. *Nature Methods*, 12: 1106-8.

19. Lambert JP, Tucholska M, Go C, <u>Knight JDR</u> and Gingras AC (2015). Proximity biotinylation and affinity purification are complimentary approaches for the interactome mapping of chromatin-associated protein complexes. *Journal of Proteomics*, 118:81-94.

20. Lant B, Yu B, Goudreault M, Holmyard D, <u>Knight JDR</u>, Xu P, Zhao X, Chin K, Wallace E, Zhen M, Gingras AC and Derry WB (2015). CCM-3/STRIPAK promotes seamless tube extension through endosome recycling. *Nature Communications*, 6:6449.

21. Turowec JP, Zukowsli SA, <u>Knight JDR</u>, Smalley DM, Graves LM, Johnson GL, Li SS, Lajoie GA and Litchfield DW (2014). An unbiased, proteomic screen reveals caspase cleavage is positively and negatively regulated by substrate phosphorylation. *Molecular and Cellular Proteomics*, 13:1184-97.

22. Couzens AL, <u>Knight JDR</u>, Kean MJ, Teo G, Weiss A, Dunham W, Lin Z-Y, Bagshaw RD, Sicheri F, Pawson T, Wrana J, Choi H and Gingras AC (2013). Protein interaction network of the mammalian Hippo pathway reveals mechanisms of kinase-phosphatase interactions. *Science Signaling,* 6: rs15.

23. Costa B, Kean MJ, Ast V, <u>Knight JDR</u>, Mett A, Levy Z, Ceccarelli DF, Badillo BG, Eils R, König R, Gingras AC and Fainzilber M (2012). STK25 mediates TrkA and CCM2 dependent death in pediatric tumor cells of neural origin. *Journal of Biological Chemistry*, 287: 29285–29289.

24. Fukuda K, <u>Knight JDR</u>, Piszczek G, Kothary R and Qin J (2011). Biochemical, proteomic, structural, and thermodynamic characterizations of ILK: Cross-validation of the pseudokinase. *Journal of Biological Chemistry*, 286:21886–21895.

Talks

1. Knight JDR, Choi H, Raught B, Nesvizhskii AI and Gingras AC (2017). ProHits-viz: a suite of web-tools for visualizing interaction proteomics data. *The 9th Annual CNPN Symposium: "Next Generation Proteomics: Functional Organization of the Human Proteome"*, Toronto,

Canada.

2. Knight JDR (2017). CNPN ProHits workshop. *The 9th Annual CNPN Symposium: "Next Generation Proteomics: Functional Organization of the Human Proteome"*, Toronto, Canada.

3. Knight JDR, Liu G, Zhang JP, Youn JY, Go C, Choi HW and Gingras AC (2016). ProHits-viz: Interactively visualizing and analyzing protein interactome data. *The 8th Annual CNPN Symposium: "Proteomic Advances in Health and Diseases"*, Montreal, Canada.

4. Knight JDR, Ceccarelli D, Sicheri F, Pawson T and Gingras AC (2013). Proteomic charactization of CCM3-GCKIII complexes. *9th Annual Angioma Alliance CCM Scientific Meeting*, Washington, DC, USA.

5. Knight JDR, Couzens A, Ceccarelli D, Guettler S, Sicheri F, Pawson T and Gingras AC (2013). Elucidating signaling networks for the Mammalian Ste20-like (MST) kinases using interaction proteomics and substrate screening. *Proteins Kinases and Protein Phosphorylation*, Niagara Falls, NY, USA.

Abstracts

Presenting author (Underlined)

1. <u>Knight JDR</u>, Liu G, Zhang JP, Larsen B, Teo G, Teo G, Tsou CC, Wang J, Bandeira N, Choi H, Nesvizhskii A and Gingras AC (2015). ProHits 2.0: a bioinformatics management and analysis system optimized for interaction studies. *14th Human Proteome Organization World Congress*, Vancouver, Canada.

2. <u>Knight JDR</u>, Liu G, Zhang JP, Pasculescu A, Choi H and Gingras AC (2015). Visualizing and analyzing protein interactome data. *14th Human Proteome Organization World Congress*, Vancouver, Canada.

3. <u>Knight JDR</u>, Go C, Liu G, Zhang JP, Choi H and Gingras AC (2014). Analyzing and visualizing interactome data. *22nd Annual International Conference on Intelligent Systems for Molecular Biology*, Boston, Massachusetts.

4. <u>Knight JDR</u>, Go C, Liu G, Zhang JP, Choi H and Gingras AC (2014). Analyzing and visualizing interactome data. *Bio-Vis Special Interest Group 4th Symposium on Biological Data Visualization*, Boston, Massachusetts.

5. <u>Knight JDR</u>, Tian R, Lee R, Ceccarelli D, Wang F, Beauvais A, Zou H, Megeney LA, Sicheri F, Figeys D, Kothary R, Pawson T and Gingras AC (2012). Quantitative phosphoproteomics for the identification of kinase substrates. *Fourth Annual CNPN Symposium*; *Proteomics: from protein structures to clinical applications*, Toronto, Canada.

6. <u>Knight JDR</u>, Lee RE, Tian R, Wang F, Zou H, Figeys D, Megeney LA and Kothary R (2010). A whole-cell lysate kinase assay identifies cytoplasmic substrates of the p38 mitogen-

activated protein kinase in differentiating myocytes. *Ottawa Hospital Research Day*, Ottawa, Canada.

7. <u>Knight JDR</u>, Lee RE, Tian R, Figeys D, Megeney LA and Kothary R (2010). Exploring the cytoplasmic role of the p38α mitogen-activated protein kinase in differentiating myocytes. *New Directions in Muscle Biology*, Ottawa, Canada.

8. <u>Knight JDR</u>, Hamelberg D, McCammon JA and Kothary R (2006). The role of conserved water molecules in stabilizing the protein kinase domain. *Ottawa Hospital Research Day*, Ottawa, Canada.

Professional Associations

Canadian National Proteomics Network (2012-2013, 2015-2017)
Human Proteome Organization (2015)
International Society for Computational Biology (2014-2015)
American Association for the Advancement of Science (2012-2013)