

## MORGAN G. I. LANGILLE, PhD

5850 College St., Lab 5D-1, P.O. Box 15000, Halifax, N.S., Canada, B3H 4R2

Webpage: <http://morganlangille.com> E-mail: [morgan.g.i.langille@dal.ca](mailto:morgan.g.i.langille@dal.ca)

Telephone: 902-433-5094

### EDUCATION

2004-2009	Ph.D. CIHR/MSFHR Bioinformatics Training Program (Department of Molecular Biology and Biochemistry)	Dr. Fiona Brinkman Simon Fraser University Burnaby, BC, Canada
1999 – 2004	Bachelor's of Science (Biology) First Division	University of New Brunswick Fredericton, NB, Canada
1999 – 2004	Bachelor's of Computer Science First Division	University of New Brunswick Fredericton, NB, Canada

### RESEARCH & RELEVANT WORK EXPERIENCE

2016 - Current	<b>Cross-appointment with Dept. Microbiology &amp; Immunology</b>	Dalhousie University Halifax, NS
2014 - Current	<b>Assistant Professor in Dept. of Pharmacology</b> Canada Research Chair Tier II in Human Microbiomics Reappointed in 2016	Dalhousie University Halifax, NS
2014 - Current	<b>Faculty Member -- Centre for Comparative Genomics &amp; Evolutionary Bioinformatics (CGEB)</b>	Dalhousie University Halifax, NS
2011 - 2013	<b>Post-Doctoral Fellow</b> <ul style="list-style-type: none"><li>• Development of new computational method for predicting metagenomes from 16S data, called "<b>PICRUST</b>" and published in Nature Biotechnology (see References).</li><li>• Analysis of mice gut microbiomes with various levels of frailty.</li><li>• Funded as a CIHR Postdoctoral Fellow</li></ul>	Dr. Robert Beiko, Computer Science Dalhousie University Halifax, NS
2009 - 2011	<b>Post-Doctoral Fellow</b> <ul style="list-style-type: none"><li>• Development of new environmental and ecological computational methods for the analysis of metagenomics data (see <a href="#">iSEEM project</a>)</li><li>• Created <a href="#">BioTorrents</a>, a open data sharing service for scientists based on the BitTorrent protocol.</li><li>• Comparative genomic analysis of eight newly sequenced haloarchaeal species.</li></ul>	Dr. Jonathan Eisen Genome Center UC Davis Davis, California
2004 - 2009	<b>Ph.D. Thesis</b> <ul style="list-style-type: none"><li>• Developed new computational methods for identifying genomic islands within bacterial genomes: <a href="http://www.pathogenomics.sfu.ca/islandviewer/">http://www.pathogenomics.sfu.ca/islandviewer/</a></li><li>• Led genome annotation and analysis of an epidemic <i>P. aeruginosa</i> strain</li></ul>	Dr. Fiona Brinkman MBB, SFU Burnaby, BC

06/2008- 08/2008	<b>Bioinformatics Instructor</b>	B.C. Institute of Technology Burnaby, BC
	<ul style="list-style-type: none"> <li>• Taught introductory classes on bioinformatics</li> </ul>	
06/2007	<b>Private Consulting</b>	Dr. Robert Naviaux UC San Diego San Diego, CA, USA
	<ul style="list-style-type: none"> <li>• Computational analysis of metagenomic data obtained from a sand sample</li> </ul>	
06/2007	<b>Canadian Bioinformatics Workshop</b>	UBC Michael Smith Laboratories Vancouver, BC
	<ul style="list-style-type: none"> <li>• Instructor for 2 lectures</li> <li>• Teaching assistant during entire workshop</li> </ul>	
09/2005- 12/2005	<b>Bioinformatics Graduate Program Lab Rotation</b>	Dr. Ryan Brinkman Terry Fox Laboratory BC Cancer Research Centre (BCCRC) Vancouver, BC
	<ul style="list-style-type: none"> <li>• Ontology development for flow cytometry</li> <li>• Included use of OWL (Web Ontology Language), XML and XSLT languages</li> </ul>	
01/2005- 04/2005	<b>Bioinformatics Graduate Program Lab Rotation</b>	Dr. Mark Wilkinson iCapture St. Paul's Hospital Vancouver, BC
	<ul style="list-style-type: none"> <li>• Deconstruction of data transformations using reusable web services</li> <li>• Included development of SOAP (Simple Object Application Protocol) web services</li> </ul>	
12/2004- 02/2005	<b>Graduate Course Research Project</b>	Dr. Ghassan Hamarneh SFU Burnaby, BC
	<ul style="list-style-type: none"> <li>• Computational algorithm and tool development for improvement of medical image segmentation</li> <li>• Included programming in Matlab and C</li> <li>• See publications</li> </ul>	
2003 & 2004	<b>Summer Research Student</b>	Dr. Denise Clark UNB Fredericton, NB
	<ul style="list-style-type: none"> <li>• Detection of retrotransposon gene duplications in <i>Drosophila melanogaster</i> and their expression profiles</li> <li>• See publications</li> </ul>	
2002	<b>Summer Research Student</b>	Dr. Patricia Evans UNB Fredericton, NB
	<ul style="list-style-type: none"> <li>• Analysis and proposal of an improvement on PSI-BLAST</li> </ul>	

## PUBLICATIONS

Trainees under my direct supervision are underlined

1. Douglas GM\*, Hansen R\*, Jones C, Dunn K, Comeau AM, Biewlawski JP, El-Omar EM, Russell RK, Hold G<sup>#</sup>, **Langille MGI**<sup>#</sup>, Van Limbergen J<sup>#</sup>. "Multi-omics Classify Disease State and Treatment Outcome in Pediatric Crohn's Disease. Manuscript in Preparation (Pre-submission Accepted to Nature) (\* joint first authors, <sup>#</sup>joint senior authors)
2. LeBlanc T and **Langille MGI**. "Drug use and age alters the drug metabolism potential of the human microbiome", Manuscript in Preparation.

3. Yurgel SN, Douglas GM, Comeau AM, Mammoliti M, Dusault A, Pecival D, and **Langille MGI**. “Wild blueberry selective pressure, agricultural management, and soil properties differentially shape bacterial and eukaryotic communities”, In Review
4. Lamoureux E, Grandy S, and **Langille MGI**. “Machine learning reveals microbiome differences in exercise mouse models”, In Review.
5. Zorz J, Comeau AM, Langille MGI, Johnson C, Li W, LaRoche J. “Drivers of regional bacterial community structure and diversity over depth and time in the Northwest Atlantic Ocean”, In Review.
6. Comeau AM, Douglas GM, and **Langille MGI** (2017) “Microbiome Helper: A custom and streamlined workflow for microbiome research”, *mSystems*, 2(1), e00127-16.
7. Rutherford K, Meehan CJ, **Langille MGI**, Tyack SG, McKay JC, McLean NL, Benkel K, Beiko RG, Benkel B (2016) “Discovery of an expanded set of avian leukosis subgroup E proviruses in chickens using Vermillion, a novel sequence capture and analysis pipeline”, *Poultry Science*, pew194.
8. Miller RR, **Langille MGI**, Montoya V, Crisan A, Stefanovic A, Martin I, Hoang L, Patrick DM, Romney M, Tyrrell G, Jones SJM, Brinkman FSL, Tang P (2016) “Genomic analysis of a serotype 5 *Streptococcus pneumoniae* outbreak in Canada 2005-2009”, *Canadian Journal of Infectious Diseases & Medical Microbiology*, 5381871.
9. Laird MR, **Langille MGI**, Brinkman FSL (2015) “GenomeD3Plot: A library for rich, interactive visualizations of genomic data in web applications”, *Bioinformatics*, Jun 20. pii: btv376
10. Dhillon B, Laird M, Shay J, Winsor G, Lo R, Nizam F, Sheldon P, Waglechner N, McArthur A, **Langille MGI**, Brinkman FSL. (2015) “IslandViewer 3: more flexible, interactive genomic island discovery, visualization and analysis”, *Nucleic Acids Research*, Jul 1;43(W1):W104-8.
11. Hester CM, Jala VR, **Langille MGI**, Umar S, Greiner KA, Haribabu B (2015) “Fecal microbes, short chain fatty acids, and colorectal cancer across racial/ethnic groups”, *World Journal of Gastroenterology*, 21(9):2759-2769.
12. **Langille MGI**, Meehan CJ, Koenig J, Dhanani AS, Rose R, Howlett S, Beiko RG (2014) “Microbial shifts in the aging mouse gut”, *Microbiome*, 2(1):50.
13. Xu Z, Malmer D, **Langille MGI**, and Way SF, Knight R (2014) “Which is more important for classifying microbial communities: who's there, or what they can do?” *ISME Journal*, 8(12):2357-9.
14. Boon E, Meehan CJ, Whidden C, Wong DH, **Langille MGI**, Beiko RG (2014) “Interactions in the microbiome: communities of organisms and communities of genes”, *FEMS Microbiology Reviews*, 38(1):90-118.
15. **Langille MGI\***, Zaneveld J\*, Caporaso JG, McDonald D, Knights D, Reyes JA, Clemente JC, Burkepille DE, Vega Thurber RL, Knight R, Beiko RG, Huttenhower C (2013) “Predictive functional profiling of microbial communities using 16S rRNA marker gene sequences”, *Nature Biotechnology*, 31(9):814-821.  
\*Co-first authors
16. Parks DH, Mankowski T, Zangooui S, Porter MS, Armanini DG, Baird DJ, **Langille MGI**, Beiko RG (2013) “GenGIS 2: Geospatial analysis of traditional and genetic biodiversity, with new gradient algorithms and an extensible plugin framework”, *PLoS ONE*, 8(7):e69885.
17. Dhillon B, Chiu T, Laird M, **Langille, MGI**, Brinkman F (2013) “IslandViewer update: improved genomic island discovery and visualization”, *NAR*, 41(W1), W129-W132.

18. Sharpton TJ, Jospin G, Wu D, **Langille MGI**, Pollard KS, Eisen JA (2012) "Sifting through genomes with iterative-sequence clustering produces a large, phylogenetically diverse protein-family resource", *BMC Bioinformatics*, 13: 624.
19. Jiang X\*, **Langille MGI\***, Neches RY, Elliot M, Levin SA, Eisen JA, Weitz JS, Dushoff J (2012) "Functional biogeography of ocean microbes revealed through non-negative matrix factorization", *PLoS ONE*, 7(9): e43866.  
\*Co-first authors.
20. Lynch EA, **Langille MGI**, Darling A, Wilbanks EG, Haltiner C, Shao KSY, Starr MO, Teiling C, Harkins TT, Edwards RA, Eisen JA, Facciotti MT (2012) "Sequencing of Seven Haloarchaeal Genomes Reveals Patterns of Genomic Flux", *PLoS ONE* 7(7), e41389.
21. **Langille MGI**, Laird MR, Hsiao WWL, Chiu TA, Eisen JA, Brinkman FSL (2012) "MicrobeDB: a locally maintainable database of microbial genomic sequences", *Bioinformatics*, 28(14), 1947–1948.
22. **Langille MGI**, Meehan CJ, Beiko RG (2012) "Human Microbiome: A Genetic Bazaar for Microbes?", *Current Biology*, 22(1), R20-22.
23. **Langille MGI**, Hsiao WWL, Brinkman FSL (2010) "Detecting of genomic islands using bioinformatics approaches", *Nature Reviews Microbiology*, 8(5), 373-82.
24. **Langille MGI** and Eisen JA (2010) "BioTorrents: A file sharing service for scientific data" *PLoS One*, 5(4): e10071.
25. Ho Sui SJ, Fedynak A, Hsiao WWL, **Langille MGI**, Brinkman FSL (2009) "The association of virulence factors with genomic islands", *PLoS One*, 4(12): e8094.
26. **Langille MGI** and Brinkman FSL (2009) "Bioinformatic detection of horizontally transferred DNA in bacterial genomes", *F1000 Biology Reports*, 1:25.
27. **Langille MGI** and Brinkman FSL (2009) "IslandViewer: an integrated interface for computational identification and visualization of genomic islands", *Bioinformatics*, 25(5):664-5.
28. Winstanley C, **Langille MGI**, Fothergill JL, Kukavica-Ibrulj I, Paradis-Bleau C, Sanschagrin F, Thomson NR, Winsor GI, Quail MA, Lennard N, Bignell A, Clarke L, Seeger K, Saunders D, Harris D, Parkhill J, Hancock REW, Brinkman FSL, and Levesque RC (2009). "Newly introduced genomic prophage islands are critical determinants of *in vivo* competitiveness in the Liverpool Epidemic Strain of *Pseudomonas aeruginosa*", *Genome Research*, 19(1):12-23.
29. **Langille MGI**, Hsiao WWL, Brinkman FSL (2008). "Evaluation of genomic island predictors using a comparative genomics approach", *BMC Bioinformatics*, 9:329
30. **Langille MGI** and Clark DV (2007). "Parent genes of retrotransposition-generated gene duplicates in *Drosophila melanogaster* have distinct expression profiles", *Genomics*, 90(3):334-43.
31. Spidlen, J, Gentleman RC, Haaland PD, **Langille MGI**, Meur NL, Ochs MF, Schmitt C, Smith CA, Treister AS, Brinkman RR (2006). "Data standards for flow cytometry", *OMICS*, 10(2):209-14.
32. Chodorowski A, Mattsson U, **Langille MGI**, Hamarneh G (2005). "Color Lesion Boundary Detection Using Live Wire", *Proceedings of SPIE Medical Imaging: Image Processing*, 5747:1589-96.
33. Hamarneh G, Yang J, McIntosh C, **Langille MGI** (2005). "3D live-wire-based semi-automatic segmentation

of medical images", *Proceedings of SPIE Medical Imaging: Image Processing*, 5747:1597-603.

## BOOK CHAPTERS

1. Meehan CJ, **Langille MGI**, Beiko RG. Frailty and the Microbiome, In Theou O and Rockwood K (eds.), *Frailty in ageing: biological, clinical and social implication*, Volume in the series Interdisciplinary Topics in Gerontology, Vol. 41, pp 54-65. Karger, Basel, 2015
2. **Langille MGI**, Zhou F, Fedynak A, Hsiao WWL, Xu Y, and Brinkman FSL. Mobile genetic elements and their prediction, In Y. Xu and J.P. Gogarten (eds.), *Computational Methods for Understanding Bacterial and Archaeal Genomes*, Series Advances in Bioinformatics and Comp. Biol., Vol. 7. Imperial College Press, London, 2008.

## ABSTRACTS

Trainees under my direct supervision are underlined

1. Stadnyk AW, Douglas GM, Comeau AM, Jain U, Schwaeble W, Stover C, Bieko RG, **Langille MGI** Properdin deficiency does not impact the mouse response to DSS-induced colitis despite differences in colonic microbiome. Canadian Digestive Disease Week, Banff, March 3-6, 2017, AB, Canada.
2. MacLellan A, Connors J, Macintyre, B, Douglas G, Dunn K, Bielawski, JP, Noble A, Mahdi G, Rashid M, Otley A, Cahill L, **Langille MGI**, Van Limbergen, J. Fibre intake is associated with microbiome changes in Pediatric Crohn's Disease patients following remission induction with exclusive enteral nutrition (EEN). 12<sup>th</sup> Congress of ECCO- Inflammatory Bowel Diseases, Feb 15-18, 2017, Barcelona, Spain.
3. Jones C, Douglas GM, Comeau AM, Hansen R, Russell R, Hold G, **Langille MGI**, and Van Limbergen J. An integrated microbiome and genetic analysis of pediatric Crohn's Disease. World Congress of Pediatric Gastroenterology, Hepatology and Nutrition, Oct. 5-8, 2016, Montreal, QC, Canada.
4. Jones C, Douglas GM, Comeau AM, Hansen R, Russell R, Hold G, **Langille MGI**, and Van Limbergen J. Assessing the relative contribution of genetics and the microbiome for predicting pediatric Crohn's Disease. ISME 16, Aug. 21-26, 2016, Montreal, QC, Canada.
5. Comeau AM, Ratten JM, Tolman J, LaRoche J, and **Langille MGI**. Evaluation of standard and hybrid assembly methods for de novo sequencing of a novel marine bacterium representing a widespread clade of North Atlantic diazotrophs. ISME 16, Aug. 21-26, 2016, Montreal, QC, Canada.
6. LaRoche J, Ratten JM, Tolman J, Comeau AM, and **Langille MGI**. The genome of a novel marine heterotrophic diazotroph isolated from the North West Atlantic Ocean sheds light on its life style. ISME 16, Aug. 21-26, 2016, Montreal, QC, Canada.
7. Hsu TY, Franzosa EA, Luo C, Wong DH, **Langille MGI**, Beiko RG, and Huttenhower C. Detecting lateral gene transfer events in host-associated microbial communities. ASM Microbe June 16-20<sup>th</sup>, 2016, Boston, MA, United States.
8. Lamoureux E, Grandy S, and **Langille MGI**. Machine Learning reveals microbiome differences in exercise mouse models. ASM Microbe, June 16-20<sup>th</sup>, 2016, Boston, MA, United States.
9. LeBlanc T and **Langille MGI**. Drug metabolism potential of the human microbiome varies by age. ASM Microbe, June 16-20<sup>th</sup>, 2016, Boston, MA, United States.

10. Comeau AM, Douglas GM, and **Langille MGI**. Integrated Microbiome Resource (IMR): Developing an Open and Streamlined Experimental and Analysis Pipeline for Microbiome Research. ASM Microbe, June 16-20<sup>th</sup>, 2016, Boston, MA, United States.
11. Comeau AM, Douglas GM, and **Langille MGI**. Integrated Microbiome Resource (IMR): Developing an Open and Streamlined Experimental and Analysis Pipeline for Microbiome Research. GLBIO/CCBC, May 16-19<sup>th</sup>, 2016, Toronto, ON, Canada.
12. LeBlanc T and **Langille MGI**. Drug metabolism potential of the human microbiome varies by age. 14th Annual Crossroads Interdisciplinary Student Health Research Conference, March 11-12, 2016, Halifax, NS, Canada. \*Selected for oral presentation
13. Lamoureux E, Grandy S, and **Langille MGI**. Exercise has a minor effect on the murine microbiome. 14th Annual Crossroads Interdisciplinary Student Health Research Conference, March 11-12, 2016, Halifax, NS, Canada. \*Selected for oral presentation
14. Jones C, Douglas G, Comeau AM, Van Limbergen J, Hansen R, Russell R, Hold G, and **Langille MGI**. Host-microbe interactions influence the development of Inflammatory Bowel Disease. 14th Annual Crossroads Interdisciplinary Student Health Research Conference, March 11-12, 2016, Halifax, NS, Canada. \*Selected for oral presentation
15. Comeau AM and **Langille MGI**. Microbiome: From Samples to Statistics in a Workweek. American Society for Microbiology General Meeting, May 30 - June 2, 2015, New Orleans, United States.
16. Kottwitz H, **Langille MGI**, White R, and Rohde J. Investigating the basis for colonization resistance to *Shigella flexneri* in the mouse colon. IHRT Graduate Student Day, May 20<sup>th</sup>, 2015, Halifax, NS, Canada
17. Shay JA, Dhillon BK, Laird MR, Winsor GL, Griffiths EJ, Berry C, Knox N, Petkau A, Reimer A, **Langille MGI**, Van Domselaar G, and Brinkman FSL. IslandViewer: More Flexible, Integrated Prediction and Visualization of Genomic Islands, Virulence Factors and Antimicrobial Resistance Genes in Bacterial Genomes. American Society for Microbiology General Meeting, May 30 - June 2, 2015, New Orleans, United States.
18. Shay JA, Dhillon BK, Laird MR, Winsor GL, Griffiths EJ, Berry C, Knox N, Petkau A, Reimer A, **Langille MGI**, Van Domselaar G, and Brinkman FSL. IslandViewer: More Flexible, Integrated Prediction and Visualization of Genomic Islands, Virulence Factors, and Antimicrobial Resistance Genes in Bacterial Genomes. Genomics Forum, May 8, 2015, Vancouver, Canada.
19. Dhillon BK, Laird MR, Shay JA, Winsor GL, Lo R, Nizam F, Pereria SK, Waglechner N, McArthur AG, **Langille MGI**, and Brinkman, FSL. IslandViewer 3 for interactive genomic island discovery, visualization and analysis in outbreaks. B.I.G. Research Day, March 20<sup>th</sup>, 2015, Vancouver, British Columbia, Canada.
20. Connors J, Hansen R, Dunn KA, **Langille MGI**, Russell RK, Otley AR, MacIntyre B, El-Omar EM, Bielawski JP, Hold GL, Van Limbergen J (2015) Assessment of community structure and predictive functional profiling of the mucosa-associated microbiome implicates alterations in benzoate metabolism in 'de novo' IBD after pouch-surgery and in treatment-naïve pediatric IBD. 10<sup>th</sup> Congress of ECCO – Inflammatory Bowel Diseases, February 18-21, 2015, Barcelona, Spain.
21. Shay, JA, Dhillon, BK, Laird, MR, Chiu, TA, **Langille, MGI**, and Brinkman, FSL. IslandViewer and IslandPlot: flexible identification, visualization, and characterization of microbial genomic regions associated with adaptations of environmental, medical, and industrial importance. Genomics: the Power and the Promise, November 24-26, 2014, Ottawa, Canada.
22. Laird MR, Winsor GL, Dhillon BK, Shay JA, Whiteside MD, **Langille MGI**, Chiu TA, Brinkman FSL (2014) Comparison and visualization of large datasets of microbial genomes. Biological Data Science, November 5-8,



2014, Cold Spring Harbor, NY, USA.

23. Hsu TY, Franzosa EA, Luo C, Wong DHJ, **Langille MGI**, Beiko RG, Huttenhower C (2014) Characterizing lateral gene transfer events in microbial communities and the human microbiome. META Center on Host-Microbe Systems Biology, August 8-10, 2014, Eugene, OR, USA.
24. Dhillon BK, Laird MR, Shay JA, Chiu TA, **Langille MGI**, and Brinkman FSL (2014). IslandViewer and IslandPlot: genomic island identification and analysis with improved annotation and more flexible, dynamic visualization. Global Microbial Identifier, September 11-12th, 2014, York, United Kingdom
25. Dhillon BK, Laird MR, Shay JA, Chiu TA, **Langille MGI**, and Brinkman FSL (2014). IslandViewer: a flexible interface for genomic island identification and visualization. SFU Health Research Day, April 10th, 2014, Burnaby, BC, Canada.
26. Dhillon BK, Laird MR, Shay JA, Chiu TA, **Langille MGI**, and Brinkman FSL (2014). IslandViewer: a flexible interface for genomic island identification and visualization. BIOF/GSAT/IOP Retreat 2014, March 28th, 2014, Vancouver, BC, Canada.
27. **Langille MGI**, Zaneveld J, Caporaso JG, McDonald D, Knights D, Reyes JA, Clemente JC, Burkepille DE, Vega Thurber RL, Knight R, Beiko RG, Huttenhower C (2013) “Predictive functional profiling of microbial communities using 16S rRNA marker gene sequences”, Applied & Environmental Microbiology, July 7-12, 2013, South Hadley, MA, USA.
28. Dhillon BK, Chiu TA, Laird MR, **Langille MGI**, and Brinkman FSL (2013) “IslandViewer: an integrated interface for genomic island identification and visualization” The Eleventh Asia Pacific Bioinformatics Conference, January 21-23, 2013, Vancouver, British Columbia, Canada
29. **Langille MGI**, Zaneveld J, Caporaso JG, Reyes J, Knights D, McDonald D, Knight R, Beiko RG, Huttenhower C (2012) “Inferring microbial community function from taxonomic composition” Microbial Genomics 2012, Sept. 16-20, 2012, Lake Arrowhead, CA, United States
30. Dhillon BK, Chiu TA, Laird MR, **Langille MGI**, and Brinkman FSL (2012) IslandViewer: an integrated interface for genomic island identification and visualization. Conference of the Canadian Society of Microbiologists, June 20-23, 2012, Vancouver, British Columbia, Canada.
31. **Langille MGI**, Zaneveld J, Caporaso JG, Reyes J, Knights D, McDonald D, Knight R, Beiko RG, Huttenhower C (2012) “Inferring microbial community function from taxonomic composition” International Human Microbiome Congress, March 19-21, 2012, Paris, France.  
\*Received Travel Award from IHMC.
32. Sharpton TJ, Jospin G, **Langille MGI**, Wu D, Eisen JA, Pollard KS (2012) “Quantifying Human Microbiome Functional Variation using Operational Protein Families” International Human Microbiome Congress, March 19-21, 2012, Paris, France.
33. **Langille MGI** and Eisen JA (2010) “Characterizing Protein Families of Unknown Function” 18<sup>th</sup> Annual International Meeting on Microbial Genomics, September 12-16, 2010, Lake Arrowhead, California, USA.
34. **Langille MGI** and Eisen JA (2010) “BioTorrents: a file sharing service for scientific data” 110<sup>th</sup> General Meeting of the American Society for Microbiology, May 23-27, 2010, San Diego, California, USA.
35. **Langille MGI** and Eisen JA (2009) “BioTorrents: a file sharing service for scientific data” Biology and Mathematics in the Bay Area Meeting, Nov. 14, 2009, Santa Cruz, California, USA.
36. Winsor GL, Rossum TV, Fleming LA, Lo R, Yu N, **Langille MGI**, Whiteside MD and Brinkman FSL (2009).

“Computational Methods to Aid Comparative Analysis of Microbial Genomes.” Genome Informatics, October 27-30, 2009, Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, USA.

37. **Langille MGI** and Brinkman FSL (2008). "IslandPick and IslandViewer: Tools for the computational identification and visualization of genomic islands." 16th Annual International Meeting on Microbial Genomics, September 14-18, 2008, Lake Arrowhead, California, USA.
38. **Langille MGI**, Hsiao WWL, and Brinkman FSL (2007). "Automated detection of prokaryotic genomic islands using a comparative genomics approach." 15th Annual International Conference on Intelligent Systems for Molecular Biology, July 21-25, 2007, Vienna, Austria.
39. Fedynak, A, Ho CK, **Langille MGI**, and Brinkman FSL (2007). "Identification of novel essential genes and pathogen-associated genomic regions". Canadian Society for Microbiologists Annual General Meeting. June 17-20, 2007, Quebec, Canada.
40. **Langille MGI**, Hsiao WWL, Fedynak A, Ho CK, and Brinkman FSL (2007). "Development and analysis of data sets of prokaryotic genomic islands." Pacific Symposium on Biocomputing, January 3-7, 2007, Maui, Hawaii, USA.
41. Hokamp K., Roche FM, **Langille MGI**, Acab M, Fulton DL, Laird M, Li Y, Lo R, Chan SK, Babiuk LA, Hancock REW, and Brinkman FSL (2006). "Bioinformatics Tools for Cross-species Comparisons of Microarray Data." World Microarray Congress 2006, March 24-25, 2006, Vancouver, B.C., Canada.
42. **Langille MGI**, Hsiao WWL, Fulton DL, Li Y, Laird M, and Brinkman FSL (2006). "Ortholuge and IslandPath: tools for the genome-wide detection of orthologs and genomic islands." International Conference on Phylogenomics, March 15-19, 2006. Sainte-Adèle, PQ, Canada.
43. Hsiao WWL, **Langille MGI**, Fedynak A, Chilana P, and Brinkman FSL (2006). "Genomic island analysis: Improved web-based software and insights into an apparent gene pool associated with genomic islands." ASM Northwest Branch Meeting 2006, March 10-12, 2006, Seattle, Washington, USA.
44. Hsiao WWL, **Langille MGI**, and Brinkman FSL (2005). "Computational characterization of genomic islands: Insights into a large, novel gene pool." National Academy of Sciences Sackler Tapestry of Life Colloquium: Lateral Transfers of Heritable Elements, December 12-13, 2005, Irvine, CA, USA.
45. Wang D, **Langille MGI**, Leung S, and Wilkinson M (2005). "Investigation of Data Transformation Frameworks for Enhancing the Interoperability of Bioinformatic Web Services" iCAPTURE Summer Student Research Day, The James Hogg iCAPTURE Centre for Cardiovascular and Pulmonary Research, Department of Pathology and Laboratory Medicine, St. Paul's Hospital / Providence Health Care-University of British Columbia, Vancouver, BC, Canada

## PRESENTATIONS

1. "Microbiome: Techniques and recent discoveries", Mar. 6, 2017, Illumina, San Diego, CA, USA.
2. "Using genetics to find new treatments of disease", Jan. 17, 2017, Picchione Lecture Series (General Public Lecture), Halifax, NS, Canada.
3. "Assessing the relative contribution of genetics and micro-omics for predicting pediatric Crohn's Disease", Nov. 10, 2016, International Human Microbiome Consortium Congress 2016, Houston, Texas, USA.
4. "Integrated Microbiome Resource: >10,000 samples", Aug. 30<sup>th</sup>, 2016, Dalhousie Microbiome Symposium,



Halifax, NS, Canada.

5. "Microbiome Analysis Workshop: Metagenomics", May 16<sup>th</sup>, 2016, GLBIO/CCBC, University of Toronto, Toronto, ON, Canada.
6. "Unraveling the complexities of the human microbiome", April 20<sup>th</sup>, 2016, Genetics & Genomics Seminar Series, Life Sciences Research Institute, Halifax, NS, Canada.
7. "Unraveling the complexities of the human microbiome", April 4<sup>th</sup>, 2016, Microbiology & Immunology Departmental Series, Dalhousie University, Halifax, NS, Canada.
8. "Microbiome insights into aging, exercise, and drug metabolism", January 14<sup>th</sup>, 2016, Dalhousie New Brunswick Departmental Series, Dalhousie New Brunswick, Saint John, NB, Canada.
9. "Exercise, drug metabolism, and the gut microbiome", October 15<sup>th</sup>, 2015, Centre for Comparative Genomics & Evolutionary Bioinformatics Seminar Series, Dalhousie University, Halifax, NS, Canada.
10. "Functional Inference, Statistics, and Visualization: PICRUSt & STAMP", August 14, 2015, Strategies and Techniques for Analyzing Microbial Population Structure, Marine Biological Laboratory, Woods Hole, MA, USA.
11. "Taxonomic and functional composition in metagenomics", June 25, 2015, Canadian Bioinformatics Workshop: Analysis of Metagenomic Data, Dalhousie University, Halifax, NS, Canada.
12. "Microbiome studies: They don't have to be complicated", April 8<sup>th</sup>, 2015, Microbiome Symposium, Dalhousie University, Halifax, NS, Canada.
13. "Exploring the human microbiome" Tom Marrie Lecture Series, April 25, 2014, Dalhousie University, Halifax, NS, Canada.
14. "Discovering human microbial interactions" Division of Otolaryngology Academic Rounds at the IWK, April 15, 2014, Halifax, NS, Canada.
15. "Microbiome Tutorial: PICRUSt & STAMP" Exploiting and Understanding Chemical Biotransformations in the Human Microbiome, April 3, 2014, Big Sky, Montana, USA.
16. "Exploring the human microbiome" Department of Biology Seminar Series, Jan. 23, 2014, Dalhousie University, Halifax, NS, Canada.
17. "Discovering human microbial interactions" Division of Haematology/Oncology Academic Rounds at the IWK, Jan. 10, 2014, Halifax, NS, Canada.
18. "Frailty and the microbiome in mice" CAG2013 Aging: from cells to society, October 17<sup>th</sup>, 2013, Halifax, NS, Canada.
19. "Social programming: Git and GitHub" Guest Lecture in CSCI3190, Sept. 24, 2013, Dalhousie University, Halifax, NS, Canada.
20. "Discovering human microbial interactions using next-gen bioinformatics" Faculty Interview Lecture, June 17, 2013, Department of Pharmacology, Dalhousie University, Halifax, NS, Canada.
21. "Predictive functional profiling of microbial communities using 16S marker gene sequences" CAU Kiel Joint Workshop, April 19, 2013, Dalhousie University, Halifax, NS, Canada.
22. "Git and GitHub" Faculty of Computer Science Free School, March 21, 2013 Dalhousie University, Halifax,

NS, Canada.

23. "Inferring microbial community function from taxonomic composition" Microbial Genomics 2012, Sept. 19, 2012, Lake Arrowhead, CA, Canada.
24. "Leveraging ancestral state reconstruction to infer community function from a single marker gene" iEvoBio, July 11, 2012, Ottawa, ON, Canada.
25. "Computational insights of pathogenic bacteria and the ocean microbiome" University of New Brunswick Biology Seminar Series, Oct. 28, 2011, UNB, Fredericton, NB, Canada.
26. "Predicting function from taxonomy", Microbiome Workshop, June 8th, 2011, Dalhousie University, Halifax, NS, Canada.
27. "BioTorrents: A File Sharing Service For Scientific Data" Open Science Summit, Jul. 30, 2010, Berkeley, California, USA.
28. "BioTorrents: A File Sharing Service For Scientific Data" Bioinformatics Technology Forum, Jun. 1, 2010, UC Davis, Davis, California, USA.
29. "Computational identification of bacterial genomic islands (large regions of horizontal gene transfer)" Bioinformatics Technology Forum, Nov. 17, 2009, UC Davis, Davis, California, USA.
30. "An introduction to systems biology and network visualization" Techniques in Biotechnology, August 11 & 12, 2008, BCIT, Burnaby, BC, Canada
31. "An introduction to bioinformatics, databases, and NCBI" Techniques in Biotechnology, June 9 & 16, 2008, BCIT, Burnaby, BC, Canada
32. "A graduate student's experience in bioinformatics" BiNS - Bioinformatics Night at SFU, Feb. 29, 2008, SFU, Burnaby, BC, Canada
33. "Introduction to Algorithms in Bioinformatics" Canadian Bioinformatics Workshop, June 22, 2007, UBC Michael Smith Laboratories, Vancouver, BC, Canada
34. "Whole Genome Alignments" Canadian Bioinformatics Workshop, June 21, 2007, UBC Michael Smith Laboratories, Vancouver, BC, Canada
35. "Developing an ontology for flow cytometry data" Bioinformatics Graduate Program Colloquium, November 25, 2005, Vancouver, BC, Canada.
36. "Identifying Genomic Islands Using Comparative Genomics" Vancouver Bioinformatics Users Group (VanBUG), November 17, 2005, Vancouver, BC, Canada.
37. "Comparative Genomics Approach to Identifying Genomic Islands" Bioinformatics Graduate Program Colloquium, September 12, 2005, Vancouver, BC, Canada.
38. "Deconstruction of data transformations into reusable web services" Bioinformatics Graduate Program Colloquium, March 11, 2005, Vancouver, BC, Canada.

## FUNDING AWARDED

Start Date	Award Type	PI	Role	Title	Value (duration)
2017 Spring	Nova Scotia Health Research Foundation: Establishment Grant	Ketan Kulkarni	Co-applicant	Role of fecal microbiome profiling in optimizing asparaginase therapy in childhood acute lymphoblastic leukemia	\$150,000 (3 years)
2017 Sept.	DMRF: Molly Appeal	Andrew Makrigiannis	Co-applicant	Translating microbiome analysis to the clinic	~\$200,000 (1 Year)
2017 Jan.	Picchione Lecture Series	Langille	PI	Funding to host a general public lecture with 8 panelists called "Using Genetics to Find New Treatments of Disease"	\$8000
2016 July	NSERC Collaborative and Research Development Grant	Langille	PI	Improving metagenomic inference and sample classification in inflammatory bowel disease	\$120,000 (2 years)
2016 June	Nova Scotia Department of Agriculture: Research Acceleration	Svetlana Yurgel	Co-applicant	Rhizo-microbiome as a tool for understanding V. angustifolium-microbe interaction	\$40,000 (1 year)
2016 May	Canada Research Chair	Langille	PI	Canada Research Chair in Human Microbiomics	\$500,000 (5 years)
2016 May	Canada Foundation For Innovation: John R. Evans Leaders Fund	Langille	PI	Integrating, classifying, and inferring the human microbiome	\$312,395 (5 years)
2016 April	NSERC Discovery Grant	Langille	PI	Integrating and modeling host-microbiome interactions	\$150,000 (5 years)
2016 Jan.	Occupational Health and Safety Futures Research Funding Program	Anil Adishes & Jeremy Beach	Co-applicant	Exposure to welding fume and the effect on the human respiratory microbiome	\$45,000 (1 Year)
2015 Nov.	Canada Foundation for Innovation: Innovation Fund	Kym Boycott	Collaborator	Research program for rare pediatric diseases (RaPiD)	\$21,000,000 (5 years)
2015 June	Canadian Breast Cancer Foundation	Paola Marcato	Collaborator	Identification of genes which determine paclitaxel sensitivity and resistance in breast cancer	\$150,000 (3 years)
2015 June	Nova Scotia Department of Agriculture: Research Acceleration	Svetlana Yurgel	Co-applicant	Evaluation of Bacterial and Fungal Diversity in Natural and Managed Blueberry Habitats	\$76,000 (2 years)
2015 July	Banting Research Foundation Discovery Award	Langille	PI	Design and implementation of a human microbiome interaction knowledge base	\$25,000 (1 year)
2014 Oct.	Dalhousie University: Strategic Research Initiatives Fund	Ford Doolittle	Co-applicant	An integrated resource for metagenomics and microbiomics in Atlantic Canada	\$200,000 (2 years)
2014 Apr.	CIHR Team Grant	Jean Marshall	Collaborator	Restitution Enhancement in Arthritis and Chronic Heart	\$2,500,000 (5 years)

				disease	
2013 Aug.	NSHRF Innovation Grant	Andrew Stadnyk	Associate	The role of the complement system in post-colitis colonization and recovery from injury	\$15,000 (1 year)
2012 Mar.	CIHR Fellowship		Nominated Principal Applicant	Predicting function from taxonomy to reveal insights into the human microbiome	\$100,000 (2 years)

## TEACHING

2017	MICI 5003: Special Topics in Microbiome Analysis – Instructor (Created and taught entire course)	Dalhousie University
2017	PHAC 1470: Pharmacology for Pharmacy – Instructor (2 x 1 hour lecture, 1 x 2 hour case study = 4 hours)	Dalhousie University
2017	PHAC 4001/5409 Pharmacology II – Instructor (7 x 1 hr = 7 hours)	Dalhousie University
2016	Metagenomics Bioinformatics Workshop – Instructor (3 hours)	EMBL-EBI, Hinxton, UK
2016	Strategies and Techniques for Analyzing Microbial Population Structure (STAMPS)– Faculty Instructor (4 hours)	MBL, Woods Hole, MA
2016	Canadian Bioinformatics Workshop: Metagenomic Analysis – Faculty Instructor (8 hours)	UBC, Vancouver, BC
2016	GLBIO/CCBC Microbiome Workshop – Instructor/Organizer (3 hours)	University of Toronto
2016	PHAC 1470: Pharmacology for Pharmacy – Instructor (2 x 1 hour lecture, 1 x 2 hour case study = 4 hours)	Dalhousie University
2016	PHAC 4001/5409 Pharmacology II – Instructor (3 x 1 hr = 3 hours)	Dalhousie University
2016	Professional Competencies MED 1 (18 x 3 hrs =54 hours)	Dalhousie University
2015	Strategies and Techniques for Analyzing Microbial Population Structure (STAMPS)– Faculty Instructor (4 hours)	MBL, Woods Hole, MA
2015	Canadian Bioinformatics Workshop: Metagenomic Analysis – Faculty Instructor *Note: First year to offer workshop and created all original content(8 hours)	Halifax, NS
2015	PHAC 4001/5409 Pharmacology II – Instructor (3 x 1 hr = 3 hours)	Dalhousie University
2013	BIOL 5705 Graduate Modules Course – Instructor (Fall)	Dalhousie University
2013	BIOC 4010/5010: Bioinformatics -- Instructor	Dalhousie University
2013	BIOL 5705 Graduate Modules Course – Instructor	Dalhousie University
2012	BIOL 5705 Graduate Modules Course -- Instructor	Dalhousie University
2011	SuperNOVA Summer Camp -- Presenter	Dalhousie University
2008	BCIT BIOT 5800 Bioinformatics -- Summer Instructor	Burnaby, BC
2007	Canadian Bioinformatics Workshop -- Instructor	UBC, Vancouver, BC
2005	Problem Based Learning -- Teaching Assistant	Simon Fraser University
2004	Shad Valley Students Orientation -- Workshop Teacher	Simon Fraser University

## RESEARCH SERVICE

- 2017/02 – current: Associate Editor for journal Microbiome (IF: 9)
- 2015/09 - current: Editor for journal mSystems
- 2015/07 - current: Chair Elect (3 year term), Division R: Evolutionary and Genomic Microbiology, American Society of Microbiology
- 2017/02: External Grant Reviewer for MITACS Accelerate

- 2017/02: Grant Review Committee Member for CIHR Project Competition
- 2017/02: External Grant Reviewer for Baylor College Collaborative Faculty Research Investment Program, Houston, USA.
- 2016/12: External Grant Reviewer for NSERC Discovery Grant
- 2016/12: External Grant Reviewer for CFI JELF
- 2016/09: External Grant Reviewer for NSF CAREERS
- 2016/03: External Grant Reviewer for AXA Research Fund Post-Doctoral Fellowship, European Science Foundation, France
- 2015/05: External Grant Reviewer for Agence Nationale de la Recherche (ANR) MICROREGAL, Paris, France
- Reviewer for Nature Methods, PNAS, PLoS Computational Biology, Bioinformatics, Nucleic Acids Research, BMC Bioinformatics, ISMEJ, PLoS One, GigaScience
  - 2016: 23 total
  - 2015: 16 total

## COMMITTEES

- 2016/09 - current: Killam Postdoctoral Fellowship Committee
- 2016/04 - current: Centre for Genomics Enhanced Medicine, Executive Committee
- 2016/04 - 2019/10: EGAD Core Operational Management Committee
- 2015/11 - current: Tenure and Promotion Committee for the Faculty of Medicine
- 2014/10 - current: Director of the Integrated Microbiome Resource (<http://cgeb-imr.ca/>)
- 2014/03 - 2015/03: Department of Pharmacology Website Committee Member

## SUPERVISION

- 2017/01-current: Principal Supervisor: PhD Student Gavin Douglas (Microbiology & Immunology)
  - Funded by Alexander Graham Bell Canada Graduate Scholarship (CGS-D) (35k/year)
- 2017/01-current: Principal Supervisor: MSc Student Casey Jones (Pharmacology)
- 2017/01-current: Principal Supervisor: MSc Student Karl Leuschen (Bioinformatics)
- 2016/09-current: Principal Supervisor: Visiting PhD Student, Montse Palau de Miguel
  - International NOVA DOMUS scholarship between University of Barcelona and Dalhousie.
- 2016/06-current: Principal Supervisor: Research in Medicine, Alex Whynot
- 2016/05-2016/08: Principal Supervisor: Undergraduate Summer Student: Molly Hayes
  - Funded by NSERC USRA
- 2015/09-current: Academic Advisor: PhD Student Jenni-Marie Ratten
- 2015/09-2016/12: Principal Supervisor: Research Assistant Gavin Douglas
- 2015/09-2015/05: Principal Supervisor: Honours Student Casey Jones



- 2015/09-current: Co-supervisor: MSc Student Ashley Dussault
- 2015/09-current: Principal Supervisor: MSc Student Emily Lamoureux
- 2014/09-2015/04: Principal Supervisor: Honours Student: Emily Lamoureux
- 2014/09-2016/08: Principal Supervisor: MSc Student Travis LeBlanc
  - Funded by NSHRF
  - Graduated with MSc
- 2014/06-current: Principal Supervisor: Research Associate Andre Comeau
- 2014/09-2016/08: Academic Advisor: MSc Student Haila Kottwitz
- 2014/09-current: Academic Advisor: MSc Student Ross Porter

## **SERVICE TO PROFESSION**

- 2017/01: Lead organizer, Picchione Lecture Series: Using Genetics to Find New Treatments of Disease, Halifax Public Library, Halifax, NS.
- 2016/09: Lead organizer, Dalhousie Microbiome Research Symposium, Dalhousie.
- 2016/08: MSc Thesis Examiner, Rana Bashwih, Bioinformatics, Dalhousie.
- 2016/07: MSc Thesis Examiner, Tiandai Gao, Medical Research Graduate Program, Dalhousie.
- 2016/04: Invited attendee of GOBLET/Elixer Workshop for Metagenomics Training, EMBL-EBI, Hinxton, UK
- 2016/04: Masters Thesis Examiner, Alex Keddy, Computer Science, Dalhousie
- 2016/04: MSc Thesis Examiner, Haila Kottwitz, Microbiology & Immunology, Dalhousie
- 2016/01: PhD Thesis Examiner, Helen Dranse, Pharmacology, Dalhousie
- 2015/12: External Examiner for MSc: Soheila Abachi, Dalhousie University (Truro Campus)
- 2015/08: Invited attendee of NimBIOS Investigative Workshop: Computational Advances in Microbiome Research, Knoxville, TN, USA
- 2015/04: Lead organizer, Microbiome Symposium, Dalhousie
- 2015/2 Masters Thesis Examiner – Jillian Rourke, Pharmacology, Dalhousie University
- 2015/4 Judge for Department of Pediatrics Research Trainee Day
- 2014/5 Judge for Department of Pathology Research Day
- 2014 & 2015 Judge for Integrated Health Research Training Partnership
- 2014-current: Lead organizer, DalMUG Journal Club (bi-monthly), Dalhousie University
- 2014, Founder of Dalhousie Microbiome User Group (DalMUG): <http://dalmug.org/>
- 2014, Organizing member of the Canadian Microbiome website: <http://microbiomecanada.ca>

## **MEDIA RELATIONS**

- 2017/01/17: Interview with CBC Radio, Information Morning Show, Halifax, NS, Canada

- 2017/01/04: “N.B.-born medical researcher attracting global attention for his work with human bacteria”:
  - Telegraph Journal (online: <https://www.telegraphjournal.com/telegraph-journal/story/49775346/n-b-born-medical-researcher-attracting>)
  - In print: Telegraph Journal, Saint John, NB, Canada
  - In print: The Daily Gleaner, Fredericton, NB, Canada
  - In print: The Kings County Record, Sussex, NB

## SOFTWARE

### Microbiome Helper

[https://github.com/mlangill/microbiome\\_helper](https://github.com/mlangill/microbiome_helper)

- Bioinformatic pipelines, standard operating procedures, and tutorials for 16S and metagenomic data.

### PICRUSt

<http://picrust.github.com>

- Metagenome inference from 16S microbial community profiling

### IslandViewer

<http://www.pathogenomics.sfu.ca/islandviewer/>

- Web-interface for identifying and visualizing genomic islands

### IslandPick

[http://www.pathogenomics.sfu.ca/islandpick\\_GI\\_datasets/](http://www.pathogenomics.sfu.ca/islandpick_GI_datasets/)

- Comparative genomics approach for identifying genomic islands

### BioTorrents

<http://www.biotorrents.net>

- Website and BitTorrent tracker for sharing of scientific open-access data

### MicrobeDB

<https://github.com/mlangill/microbedb/>

- Local system for downloading, storing and accessing through a MySQL database all completed microbial genomes

## SCHOLARSHIPS & AWARDS

2016	Canada Research Chair (Tier II) in Human Microbiomics	\$500,000
2012	IHMC 2012 Conference Travel Award	\$600
2008	SFU President's PhD Research Stipend	\$6000
2008	MBB Travel Fellowship	\$450
2006	MSFHR Junior Graduate Studentship Research award	\$45,000
2005	NAS Sackler Colloquium Tapestry of Life Conference Travel Grant	\$350
2004	CIHR/MSFHR Strategic Training Program in Bioinformatics Award	\$36,000
2003	John J. McCaffrey Scholarship	\$800
2002	NSERC - Undergraduate Student Research Award	\$4800
2001	Khaki University & YMCA Scholarship	\$700
2000	Rolf Riegger Bursary	\$950
2000	Purdy MacDonald Scholarship	\$250
1999	Martha Fraser McIntosh Scholarship	\$675
1999	Brock A. Turner Memorial Scholarship	\$825

## CERTIFICATES

- Jan. 2016 Biosafety Training
- Sept. 2014 Responsible Conduct of Research Workshop