JORDAN E. BISANZ

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RESEARCH INTERESTS

Pursuing mechanistic studies of how microbes influence the metabolism and uptake of xenobiotics in the digestive system.

EDUCATION

2010-2015 Western University, London, Canada
Degree: Doctor of Philosophy, Department of Microbiology and Immunology
Dissertation title: Clinical and mechanistic insights into novel probiotic functions and formulations
Supervisor: Dr. Gregor Reid

2006-2010 Western University, London, Canada
Degree: Honors Bachelor of Medical Sciences with distinction (B.M.Sc. Hons.), Department of Microbiology and Immunology

HONORS/AWARDS

2015-2017 NSERC Postdoctoral Fellowship
Granting organization: Natural Sciences and Engineering Research Council of Canada
Title of proposal: Programming of host immunity by the colonizing microbiota at birth

2012-2015 Alexander Graham Bell Doctoral Canada Graduate Scholarship
Granting organization: Natural Sciences and Engineering Research Council of Canada
Title of proposal: Comparative genomics to identify the mechanisms through which lactic acid bacteria detoxify environmental compounds.

2013 Wellcome Trust Travel Bursary
Granting organization: Wellcome Trust
Title of abstract: Mechanisms by which lactic acid bacteria act on environmental toxins and the potential for fermented foods to reduce toxin adsorption.

2012 CIDA Students for Development Grant
Granting organization: Canadian International Development Agency
Title of proposal: Efficacy of probiotics in reducing toxin levels in mothers and children

2012 African Mobility Fund Grant
Granting organization: The Africa Institute at Western University
Title of proposal: Investigating the effects of probiotic yogurt on reducing the levels of environmental toxins among school children in Mwanza, Tanzania

2012-2013 Ontario Graduate Scholarship
Granting organization: Ontario Ministry of Training, Colleges and Universities
**Declined as had already accepted NSERC CGS-D award*

2011-2012 Ontario Graduate Scholarship
Granting organization: Ontario Ministry of Training, Colleges and Universities

2011-2014 Microbiology and Immunology Travel Award
Granting organization: Microbiology and Immunology Department, Western University

PUBLICATIONS

Bisanz JE, MK Enos, J Mwanga, J Changalucha, JP Burton, GB Gloor and G Reid. 2014. The influence of probiotics and the gut microbiome on toxic metal levels in Tanzanian pregnant women and school children: a randomized open-label pilot study. mBio. 5(5):e01580-14. DOI: 10.1128/mBio.01580-14

Bisanz JE, MK Enos, G PrayGod, S Seney, JM Macklaim, S Chilton, D Willner, R Knight, C Fusch, G Fusch, GB Gloor, JP Burton and G Reid. 2015. The microbiota at multiple body sites during pregnancy in a rural Tanzanian population and the effects of Moringa supplemented probiotic yogurt. Applied and Environmental Microbiology. 81(15):4965-4975. DOI:10.1128/AEM.00780-15

Bisanz JE, P Suppiah, M Thomson, T Milne, N Yeoh, A Nolan, G Ettinger, G Reid, GB Gloor, JP Burton, M Cullinan and S Stebbings. 2014. Published abstract: Comprehensive analysos of the oral microbiome in axial spondyloarthritis reveals associations with disease activity and periodontitis. Annals of the Rheumatic Diseases. 73:422-443. DOI:10.1136/annrheumdis-2014-eular.3406

Bisanz JE, S Seney, A McMillan, R Vongsa, D Koenig, GB Gloor, M Sumarah, B Ford, D Herman, JP Burton and G Reid. 2014. A systems biology approach investigating the effect of *Lactobacillus rhamnosus* GR-1 and *L. reuteri* RC-14 on the vaginal microbiome and host responses in a double blind, placebo-controlled clinical trial of post-menopausal women with intermediate Nugent scores. PLoS ONE. 9(8):e104511. DOI:10.1371/journal.pone.0104511

Bisanz JE, JM Macklaim, GB Gloor and G Reid. 2014. Bacterial metatranscriptome analysis of a probiotic yogurt using a RNA-Seq approach. International Dairy Journal. 39(2):284-292. DOI: 10.1016/j.idairyj.2014.07.010

Bisanz JE, and G Reid. 2011. Unraveling how probiotic yogurt works. Science Translational Medicine. 3(106):106ps41

Bisanz JE*, R Hummelen*, JM Macklaim*, JA Hammond, A McMillan, R Vongsa, D Koenig, GB Gloor, and G Reid. 2011. Vaginal Microbiome and epithelial gene array in post-menopausal women with moderate to severe dryness. PLoS ONE. 6(11):e26602 *Equal contributions

McMillan A, S Rulisa, M Sumarah, JM Macklaim, J Renaud, **JE Bisanz**, GB Gloor and G Reid. 2015. A multi-platform metabolomics approach identifies highly specific biomarkers of bacterial diversity in the vagina of pregnant and non-pregnant women. Scientific Reports. 5:14174. DOI:10.1038/srep14174

Trinder M, **JE Bisanz,** JP Burton and G Reid. 2015. Probiotic lactobacilli: a potential prophylactic treatment for reducing pesticide absorption in humans and wildlife. Beneficial Microbes. 6(6):841-847.

Trinder M, **JE Bisanz,** JP Burton and G Reid. 2015. Bacteria need “sleep” too? Microbiome circadian rhythmicity, metabolic disease and beyond. University of Toronto Medical Journal. 92(3):52-55.

Reid NSJ, **JE Bisanz**, M Monachese, JP Burton and G Reid. 2013. The rationale for Probiotics improving reproductive health and pregnancy outcome. American Journal of Reproductive Immunology. 69:558-566.

Macphee RA, R Hummelen, **JE Bisanz**, WL Miller and G Reid. 2010. Probiotic strategies for the treatment and prevention of bacterial vaginosis. Expert Opinion on Pharmacotherapy. 11(18):2985-2995.

PATENTS

Bisanz JE, G Reid, M Monachese, JET Van Hylckama Vlieg, T Smokvina, and JP Burton. Food Grade Bacteria for the Removal of Toxic Compounds. April 5, 2013. WO2013149333

Bisanz JE, G Reid, M Monachese, JET Van Hylckama Vlieg, T Smokvina, and JP Burton. *Lactobacillus rhamnosus* CNCM I-4716 food grade bacteria. April 5, 2013. WO2013150497

INVITED PRESENTATIONS

Bisanz JE. Mechanistic studies on the role of microbes in host toxic metal uptake. April 2015. Institut Pasteur, Lille, France

Bisanz JE. Identifying mechanisms through which lactic acid bacteria act on environmental toxins and the role of microbes in host toxin uptake. July 2013, University of Reading: Whiteknights Campus, Reading, United Kingdom.

Bisanz JE. Understanding and manipulating the human microbiome: probiotics for men, women and children. November 2012. National Institute for Medical Research: Mwanza, Tanzania.

ORAL CONFERENCE PRESENTATIONS AS PRESENTER

Bisanz JE. Developing novel probiotic approaches to detoxification of environmental pollutants. March 2015. Beneficial Microbes Conference. The Hague, The Netherlands.

Bisanz JE, J Mwanga, J Changalucha, M Enos, JP Burton, T Smokvina, J van Hylckama Vlieg, GB Gloor and G Reid**.** Mechanisms by which lactic acid bacteria act on mercury and the potential for fermented foods to reduce toxic metal uptake. Joint International Union of Microbiological Societies and Canadian Society of Microbiologists conference. July 2014. Montreal, Quebec, Canada.

Bisanz JE. Mercury Rising. Gut Microbiology: from Sequence to Function. Joint INRA/Rowett and International Association for Probiotics and Prebiotics Meeting. June 2014. Aberdeen, Scotland.

Bisanz JE, M Monachese, N Nduti, J Mwanga, J Changalucha, M Enos, JP Burton, T Smokvina, J van Hylckama Vlieg, GB Gloor and G Reid. Identifying mechanisms through which lactic acid bacteria act on environmental toxins and the efficacy of fermented foods in reducing host toxin uptake. Exploring Human Host-Microbiome Interactions in Health and Disease: July 2013. Cambridge, United Kingdom.

Bisanz JE, JM Macklaim, A Fernandes, A McMillan, J Younes, H Busscher, H Van Der Mei, GB Gloor, and G Reid. *Lactobacillus* in vaginal health. Canadian Society of Microbiologists Conference: June 2011. St. John's, Newfoundland, Canada.

CONFERENCE POSTER PRESENTATIONS AS PRESENTER

Bisanz JE, M Trinder, JP Burton, T Smokvina, JET van Hylckama Vlieg, GB Gloor and G Reid. Developing novel probiotic approaches to counter dietary toxic metal exposure. Annual International Society of Probiotics and Prebiotics annual meeting. May 2013. Washington DC, USA.

Bisanz JE, J Mwanga, J Changalucha, M Enos, J Burton, T Smokvina, JET van Hylckama Vlieg, GB Gloor and G Reid. Identifying mechanisms through which lactic acid bacteria act on environmental toxins and the efficacy of fermented foods in reducing host toxin uptake. Probiotics, Prebiotics, and the Host Microbiome: The Science of Translation: June 2013. New York Academy of Sciences, New York, USA.

Bisanz JE, J Mwanga, J Changalucha, M Enos, J Burton, T Smokvina, JET van Hylckama Vlieg, GB Gloor and G Reid. Identifying mechanisms through which lactic acid bacteria act on environmental toxins and the efficacy of fermented foods in reducing host toxin uptake. London Health Sciences Research Day: March 2013. London, Ontario Canada.

Bisanz JE, JET van Hylckama Vlieg, T Smokvina, GB Gloor, WL Miller and G Reid. 2011. Identification of probiotic strains and mechanisms to carry out detoxication of environmental toxins. Lawson Research Day: March 2011. London, Ontario, Canada.

Bisanz JE, JM Macklaim, A McMillan, R Hummelen, GB Gloor, and G Reid. The "Interactome" approach to understanding the role of the microbiota in vaginal health and disease. Microbes for Health 2nd International Symposium. December 2011, Paris, France.

Hummelen R, JM Macklaim, **JE Bisanz***, R Macphee, JA Hammond, A McMillan, GB Gloor and G Reid. The vaginal Microbiome of post-menopausal women: What is it telling us? International Human Microbiome Congress: March 2011. Vancouver, British Columbia, Canada. **Presenting Author*

Bisanz JE, JET van Hylckama Vlieg, T Smokvina, GB Gloor, WL Miller and G Reid. 2011. Identification of probiotic strains and mechanisms to carry out detoxication of environmental toxins. Lawson Research Day: March 2011. London, Ontario, Canada

Bisanz JE, JET van Hylckama Vlieg, WL Miller and G Reid. 2010. Uncovering the mechanisms through which probiotics may protect against environmental carcinogens. Infection and Immunity Research Forum: November 2010. London, Ontario, Canada

SKILLS

Computational. I have first-hand worked with sequencing data from the following platforms: Illumina MiSeq (genome, 16S rRNA), Illumina HiSeq (RNA-seq), Ion Torrent (genome and 16S rRNA) and SOLiD 4 (RNA-seq). I have also worked on multiple occasions with Affymetrix microarray data. I am capable of scripting in Perl, Unix Shell, and R with some experience in Python, Java, Visual Basic and HTML. I have experience with a wide variety of command-line based programs and packages including: QIIME (16S rRNA), Trinity (RNA-seq de novo assembly), Velvet (genome assembly), Bowtie (read aligner), ALDEx (multi-omics differential expression), and DESeq (RNA-seq differential expression). I have experience with the following GUI-based programs including: Partek Genomic Suite, CLC Genomics Workbench, and Ingenuity Pathway Analysis.

Wet Lab. In addition to common microbiology and cell culture skills, I am capable of both gene knockout and the heterologous expression in *Lactobacillus* strains. I have considerable experience with RNA work in both prokaryotic and eukaryotic sources. I routinely carry out RT-qPCR with both SYBR-green and Taqman Primers.

I established the Earth Microbiome Project protocols for high-throughput DNA extraction (96-well MoBio Power Soil) in our lab and personally set up an automated liquid handling system (Beckman Coulter Biomek) for pre-PCR work. I am currently gaining experience with mouse models at the Pasteur Institute of Lille including basic handling, oral gavage, behavioral assays, and dissection of the GI tract and internal organs.

Clinical Trials. I have considerable experience with clinical trials and have been involved in 2 randomized open-label trials, and a double-blinded clinical trial with an industry sponsor (Kimberly Clark). I have completed the paperwork for ethical approval from multiple institutional review boards as well as trials registration on clinicaltrials.gov.

Teamwork and Leadership. I have supervised summer students, and laboratory volunteers. I have generated SOPs for standardized analysis both in London and Mwanza Tanzania. I have co-organized two student conferences as part of the ISAPP Students and Fellows Association as well as numerous events for both the Department of Microbiology/Immunology and the Lawson Health Research Institute. International collaborations with industry scientists were frequent during my PhD studies (Danone and Kimberly Clark Corporation).

RELEVANT WORK EXPERIENCE

2008-2009 London Public Health Laboratory (Ontario Public Health Agency)
Position: Summer laboratory assistant in environmental bacteriology

Supervisors: Dr. Abdul Chagla (2008) and Christine Fry (2009, rehired)
Duties: Processing and testing of private/public water samples for fecal coliform and E. coli levels, media preparation and quality control, and data entry.

ADDITIONAL TRAINING

2011 Macromolecular Informatics 9545S.
Course topics: Perl, Shell Scripting, R, Mapping and determining differential expression in RNASeq datasets.
Department of Biochemistry, Western University.

2012 International Development Short Course.
Canadian International Development Agency.

LEADERSHIP/SERVICE

2015 Peer reviewer: Environmental Science and Technology
American Chemical Society

2015 Peer reviewer: International Journal of Food Microbiology
Elsevier

2014-2015 Peer reviewer: PLoS ONE
Public Library of Science

2014 Question panelist for London, ON public screening of Microbirth
Duties: Answer viewer questions on the current understanding of the role of the microbiota at birth and general information about probiotics in pregnancy.
London Public Library, London, Canada

2013-Present ISAPP Students and Fellows Association Executive
Positions: ISAPP and Industry Liaison (2013-2014), Webmaster (2014-2015)
Duties: Conference organization (Aberdeen 2014, Washington DC 2015) and recruiting.
International Scientific Association for Probiotics and Prebiotics

2012-2013 Lawson Association of Students and Fellows Co-president
Duties: Organizing networking events and holiday party with 100+ attendees.
Lawson Health Research Institute, London, Canada

2011-2012 Microbiology and Immunology Social Committee Co-chair
Duties: Organizing networking events and holiday party with 122 attendees.
M&I Department, Western University, London, Canada

2011 Judge at Canada Wide Science Fair
Duties: Evaluating and ranking the senior high-school finalists.
Seneca College, Toronto, Canada

2010 Judge at Lucas Secondary School Science Fair
Duties: Evaluating junior high-school projects on green technologies.
Lucas Secondary School, London, Canada

2007-2010 Western Heads East Student Executive Member
Duties: Coordinating student fundraising efforts for probiotic yogurt project in Tanzania.
Western University, London, Canada

TEACHING EXPERIENCE

2013-2014 Lecturer/Teaching Assistant (Microbiology for Nursing 3820A)
Duties: Delivered 1 hour lectures on prevention, diagnosis, and treatment of *Neisseria, Chlamydia* and Spirochetes for a 3rd year undergraduate course of 302 students. Prepared, administered and graded randomized case studies comprising 25% of final grade.
Department of Microbiology and Immunology, Western University, London, Canada

2014 Teaching Assistant (Introduction to Biology 1002B)
Duties: Delivering 2 hour lectures combined with facilitating student discussion groups covering concepts in general scientific literacy.
Department of Biology, Western University, London, Canada

2013 Teaching Assistant (Genetics 2581A)
Duties: Delivering 1.5 hour tutorial lectures on basic concepts in genetics and answering student questions.
Department of Biology, Western University, London, Canada

2011 Teaching Assistant (Biology of Prokaryotes Lab Course)
Duties: Teaching basic bacteriology lab skills such as culture, media preparation and traditional identification approaches such as API-20E strips.
Department of Microbiology and Immunology, Western University, London, Canada

PROFESSIONAL AFFILIATIONS

2011-present Canadian Society of Microbiologists