

## CURRICULUM VITAE

### KATHERINE A. DUNN

*Department of Biology, Dalhousie University  
Division of Oncology and Haematology, IWK Health  
email: kathy.dunn@dal.ca*

#### EDUCATION AND TRAINING

Research Associate, Division of Oncology and Haematology, IWK, 2020-present;  
Supervisor: Ketan Kulkarni

Research Associate, Department of Pediatrics, Dalhousie University, 2019;  
Supervisor: Ketan Kulkarni & Johan Van Limbergen

Research Associate, Department of Biology, Dalhousie University, 2017-2019;  
Supervisor: Joseph Bielawski & Johan Van Limbergen

Research Associate, Department of Biology, Dalhousie University, 2013-2017;  
Supervisor: Joseph Bielawski

Tula foundation Post-Doctoral Research Fellow, Department of Biology, Dalhousie University, 2007-2013

NSERC Post-Doctoral Research Fellow, Department of Biology, Dalhousie University, 2006-2007

Genome Atlantic Post-Doctoral Research Fellow, Department of Biology, Dalhousie University, 2003-2006

Post-Doctoral Research Fellow, Department of Biology, University College London, UK, 1999-2003

Ph.D. 2001 Texas A&M University

M.A. 1994 Hofstra University

B.S. 1990 Long Island University Southampton

#### PUBLICATIONS

Dunn KA, Connors J, Bielawski JP, Nearing JT, Langille MGI, Van Limbergen J, Fernandez CV, Mac Donald T, Kulkarni K. **The relationship between the gut microbiome and changes in serum asparaginase levels in children**

**undergoing treatment for acute lymphoblastic leukemia.** *submitted to Leukemia and Lymphoma*

Cui TT, Dawson T, McLatchie S, Dunn KA, Bielawski JP, Walsh D. **Modelling free-living and particle-associated bacterial assemblages across the deep and hypoxic Lower St. Lawrence Estuary 2020** *accepted mSphere*

Jones CMA, Moore-Connors J, Dunn KA, Bielawski JP, Comeau AM, Langille MGI, Van Limbergen J. **Bacterial taxa and functions are predictive of sustained remission following exclusive enteral nutrition in pediatric Crohn's disease** *Inflammatory Bowel Disease* 2020 iza001

Connors J\*, Dunn KA\*, Allott J, Bandsma R, Noble A, Rashid M, Otley AR, Bielawski JP, Van Limbergen J. **The Relationship Between Bile Acids and Gut Community Structure in Pediatric Crohn's Disease** *ISME* 2020 Mar;14(3):702-713. \* co-first author

Levine A, Wine E, Assa A, Sigall Boneh R, Shaoul R, Kori M, Cohen S, Peleg S, Shamali H, On A, Millman P, Abramson L, Ziv-Baran T, Grant S, Abitbol G, Dunn KA, Bielawski JP, Turner D, Van Limbergen. **Crohn's Disease Exclusion Diet Plus Partial Enteral Nutrition Induces Sustained Remission in a Randomized Controlled Trial** *Gastroenterology* 2019 Aug;157(2):440-450.e8. doi: 10.1053/j.gastro.2019.04.021

Dunn KA, Kenney T, Gu H, Bielawski J. 2019. **Improved inference of site-specific positive selection under a generalized parametric codon model when there are multinucleotide mutations and multiple nonsynonymous rates.** *BMC Evolutionary Biology* 19(1):22. DOI: 10.1186/s12862-018-1326-7.

Dunn KA, Andrews K, Bashwih R, Bielawski J. 2018. **Bayesian Inference of Microbial Community Structure from Metagenomic data using BioMiCo.** In: Beiko R, Hsiao W, Parkinson J, editors. *Microbiome Analysis: Methods and Protocols*. 1st In Pr. Totowa, NJ: Humana Press.

Douglas GM, Hansen R, Jones C, Dunn KA, Comeau AM, Bielawski JP, El-Omar EM, Russell RK, Hold G, Langille MGI, Van Limbergen J. 2018 **Multi-omics differentially classify disease state and treatment outcome in pediatric Crohn's disease.** *Microbiome* 6(1):13.

Dunn KA, Moore-Connors J, MacIntyre B, Stadnyk A, Thomas NA, Noble A, Mahdi G, Rashid M, Otley A, Bielawski JP, Van Limbergen J. 2016. **Early changes in microbial community structure are associated with sustained remission after nutritional treatment of pediatric Crohn's disease.** *Inflammatory Bowel Disease*. 22(12):2853-2862.

Dunn KA, Moore-Connors J, MacIntyre B, Stadnyk A, Thomas NA, Noble A, Mahdi G, Rashid M, Otley A, Bielawski JP, Van Limbergen J. 2016. **The gut microbiome of pediatric Crohn's disease differs from healthy controls in genes that can influence the balance between a healthy and dysregulated immune response.** *Inflammatory Bowel Disease*. 22(11):2607-2618.

Baker JL, Dunn KA, Mingrone J, Wood BA, Karpinshi BA, Sherwood CC, Wildman DE, Maynard TM, Bielawski JP. 2016. **Functional divergence of the Nuclear receptor NR2C1 as a modulator of pluripotentiality during Hominid evolution.** *Genetics*. 203(2):905-922.

Moore-Connors J.M., Dunn K.A., Bielawski J.P., Van Limbergen J. 2016. **Novel strategies for applied metagenomics.** *Inflammatory Bowel Disease*. 22(3):709-718.

Xu X, Dunn KA, Field C. 2015. **A Robust ANOVA approach to estimating a phylogeny from multiple genes.** *Molecular Biology Evolution*. 32(8):2186-2194.

Shafiei M, Dunn KA, Boon E, MacDonald SM, Walsh DA, Gu H, Bielawski J.P., 2015. **BioMiCo: a supervised Bayesian model for inference of microbial community structure.** *Microbiome*. 3:3:8.

El-Swais H, Dunn KA, Bielawski JP, Li WWK, Walsh D. 2014. **Seasonal assemblages and short-lived blooms in coastal north-west Atlantic Ocean bacterioplankton: Bacterial diversity in Bedford Basin.** *Environmental Microbiology*. 17(10):3642-3661.

Shafiei M, Dunn KA, Chipman H, Gu H, Bielawski JP. 2014. **BiomeNet: A Bayesian model for inference of metabolic divergence among microbial communities.** *PLoS Computational Biology*. 10(11):e1003918

Dunn KA, Jiang W, Field C, Bielawski JP. 2013. **Improving evolutionary models in mitochondrial protein data with site-class specific amino acid exchangeability matrices.** *PLoS ONE* 8(1): e55816

Gu, H, Dunn KA, Bielawski JP. 2011. **Likelihood based clustering (LiBaC) for codon models.** in *Codon Evolution* (Cannarozzi GM, Schneider A, eds.). Oxford University Press.

Rowe DL, Dunn KA, Adkins RM, Honeycutt RL. 2010. **Molecular clock keeps dispersal hypothesis afloat: evidence for trans-Atlantic rafting by rodents.** *Journal of biogeography*. 37:305-324.

Dunn KA, Bielawski JP, Ward TJ, Urquhart C, Gu H. 2009. **Reconciling ecological and genomic divergence among lineages of *Listeria* under an**

**extended mosaic genome concept.** *Molecular Biology and Evolution.* 26: 2605-2615.

Ward TJ, Ducey TF, Usgaard T, Dunn KA, Bielawski JP. 2008. **A multilocus genotyping assay for SNP-based subtyping of *Listeria monocytogenes*.** *Applied and Environmental Microbiology.* 74: 7570-7577.

Bao L, Gu H, Dunn KA, Bielawski JP. 2008. **Likelihood Based Clustering (LiBaC) for codon models, a method for grouping sites according to similarities in the underlying process of molecular evolution.** *Molecular Biology and Evolution.* 25: 1995-2007.

Anisimova M, Bielawski JP, Dunn KA, Yang Z. 2007. **Phylogenomic analysis of natural selection pressure in *Streptococcus*.** *BMC Evolutionary Biology.* 7:154.

Hurley<sup>#</sup> IA, Lockridge Mueller<sup>#</sup> R, Dunn<sup>#</sup> KA, Schmidt EJ, Friedman M, Ho RK, Prince VE, Yang Z, Thomas MG, Coates MI. 2007. **A new time-scale for ray-finned fish evolution.** *Proceedings Royal Society B.* 274:489-498. <sup>#</sup>Authors contributed equally

Bao L, Gu H, Dunn KA, Bielawski JP. 2007. **Methods for selecting fixed-effect models for heterogeneous codon evolution, with comments on their application to gene and genome data.** *BMC Evolutionary Biology.* 7:S5

Bielawski JP, Dunn KA, Sabehi G, Bèjà O. 2004. **Darwinian adaptation of proteorhodopsin to different light intensities in the marine environment.** *Proceedings of the National Academy of Science.* 101:14824-14829.

Dunn KA, McEachran JD, Honeycutt RL. 2003. **Molecular phylogenetics of myliobatiform fishes (Chondrichthyes: Myliobatiformes), with comments on the effects of missing data on parsimony and likelihood.** *Molecular Phylogenetics and Evolution.* 27:259-270.

Dunn KA, Bielawski JP, Yang Z. 2001. **Rates and patterns of synonymous substitutions in *Drosophila*: implications for translational selection.** *Genetics.* 157:295-305.

Bielawski JP, Dunn KA, Yang Z. 2000. **Rates of nucleotide substitution and mammalian nuclear gene evolution: approximate and maximum-likelihood methods lead to different conclusions.** *Genetics.* 156:1299-1308.

McEachran JD, Dunn KA. 1998. **Phylogenetic analysis of skates, a morphologically conservative clade of elasmobranchs (Chondrichthyes: Rajidae).** *Copeia.* 2:271-290.

Morrissey JF, Dunn KA, Mulé F. 1997. **The phylogenetic position of *Megachasma pelagios* inferred from mtDNA sequence data.** Pages 33-37 in *Biology of the megamouth shark* (Yano K, Morrissey JF, Yabumoto Y, Nakaya K, eds.). Tokai University Press, Tokyo, Japan.

McEachran JD, Dunn KA, Miyake T. 1996. **Interrelationships within the batoid fishes (Chondrichthyes:Batoidea).** Pages 63-84 in *Interrelationship of fishes* (MLJ Stiassney MLR, Parenti LR, Johnson GD, eds.). Academic Press, New York.

Dunn KA, Morrissey JF. 1995. **Molecular phylogeny of elasmobranchs.** *Copeia*. 3:526-531.

## CONFERENCE PUBLICATIONS

Ghiboub M, Charlotte Verburgt CM, Penny S, Sigall Boneh R, Wine E, Cohen A, Dunn KA, Pinto D, Benninga M, Levine A, de Jonge WJ, van Limbergen JE. (2020) **Diet-induced remission in pediatric Crohn's disease is associated with a marked decrease of Kynurenine, a tryptophan metabolite associated with inflammation.** United European Gastroenterology week UEGW Oct 11-13 2020 Oral presentation

Verburgt CM, Ghiboub M, Penny S, Sigall Boneh R, Wine E, Cohen A, Dunn KA, Pinto D, Benninga M, Levine A, de Jonge WJ, van Limbergen JE. (2020) **Diet-induced remission is not driven by bile acid modification.** United European Gastroenterology week UEGW Oct 11-13 2020 Poster presentation

Dunn KA, Connors J, Van Limbergen J, Langille MGI, Fernandez CV, MacDonald T, Kulkarni K. (2020) **Significant association of gut microbiome with serum asparaginase levels in pediatric patients with acute lymphoblastic leukemia.** International Society of Paediatric Oncology SIOP Oct 14-27, 2020 Oral presentation

Walters I, Connors J, Dunn KA, Van Limbergen J, West M, Dyack S. (2020) **A Comparison of the Gut Microbiome in Children Affected by Fabry Disease and their Unaffected Siblings: A Pilot Project** WORLDSymposium poster presentation

Levine A, Dunn KA, Gerasimidis K, Bielawski JP, Sigall-Boneh R, Wine E, Van Limbergen J. (2019) **Fecal SCFA measurement and microbiome metabotype shifts in nutritional therapy of pediatric Crohn's disease.** UEGW oral presentation

Dunn KA, Bielawski JP, Sigall-Boneh R, Shamir R, Wine E, Levine A, Van Limbergen J. (2019) **Shifts in bacterial community function are associated with short chain fatty acid pathways during nutritional therapy in Pediatric**

**Crohn's disease patients. UEGW oral presentation**

Levine A, Dunn KA, Gerasimidis K, Bielawski JP, Sigall-Boneh R, Wine E, Van Limbergen J. (2019) **Fecal SCFA measurement and microbiome metabotype shifts in nutritional therapy of pediatric Crohn's disease.** PIBD poster of destination

Dunn KA, Bielawski JP, Sigall-Boneh R, Shamir R, Wine E, Levine A, Van Limbergen J. (2019) **Shifts in bacterial community function are associated with short chain fatty acid pathways during nutritional therapy in Pediatric Crohn's disease patients.** PIBD oral presentation

Dunn KA, Bielawski JP, Turner D, Sigall-Boneh R, Shamir R, Wine E, Van Limbergen J, Levine A. (2019) **EEN and CDED produce broadly similar taxonomic changes during the induction of remission, but many taxa rebound upon the transition from EEN back to free diet.** European Crohn's and Colitis Organization.

Allott J, Dunn K, Connors J, Bandsma R, Whitehouse S, MacIntyre B, Noble A, Rashid M, Otley A, Bielawski J, Van Limbergen J. (2018) **Identification of a Bile Acid profile and Gut Microbiome Community Structure associated with early flare after nutritional therapy in Paediatric Crohn's Disease** UEGW

Dunn KA, Sigall-Boneh R, Bielawski JP, Turner D, Van Limbergen J, Levine A. (2017) **Crohn's disease exclusion diet and partial enteral nutrition (CDED+PEN) vs exclusive enteral nutrition (EEN). Microbiome changes of a randomized clinical trial (RCT) in pediatric CD: remission is associated with similar structural + functional profiles.** *Journal of Crohn's and Colitis* 11(suppl\_1):S29-S29.

Dunn KA, Moore-Connors J, MacIntyre B, Stadnyk A, Thomas NA, Noble A, Mahdi G, Rashid M, Otley AR, Bielawski JP, Van Limbergen J. (2016) **Early changes in microbial community structure are associated with sustained remission following nutritional treatment of Pediatric Crohn's Disease.** World Congress of Pediatric Gastroenterology, Hepatology and Nutrition

Dunn KA, Connors-Moore J, MacIntyre B, Mahdi G, Noble A, Rashid M, Thomas N, Stadnyk A, Otley AR, Bielawski JP, Van Limbergen J. (2016) **EEN induces significant changes in the metabolic capacity of gut microbiomes in pediatric CD patients.** World Congress of Pediatric Gastroenterology, Hepatology and Nutrition

Connors J, Dunn KA, Bielawski JP, Stadnyk A, Thomas NA, Otley AR, Van Limbergen J. (2015). **Clinical Remission Induced by Exclusive Enteral Nutrition (EEN) in Pediatric Crohn's Disease is Associated with Microbiome**

**Metabolic changes toward increased Xenobiotic Biodegradation and Metabolism.** Digestive Disease Week Gastroenterology

Dunn KA, Connors J, MacIntyre B, Stadnyk A, Bielawski JP, Thomas N, Otley AR, Van Limbergen J. (2015). **Clinical remission induced by exclusive enteral nutrition (een) in pediatric Crohn's disease is associated with microbiome metabolic changes toward increased xenobiotic biodegradation and metabolism.** United European Gastroenterology Week

Connors J, Hansen R, Dunn KA, Langille MG, Russell R, Otley AR, MacIntyre B, El-Omar E, 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.** Digestive Disease Week Gastroenterology

Dunn KA, Connors J, MacIntyre B, Stadnyk A, Bielawski JP, Thomas N, Otley AR, Van Limbergen J. (2015). **The dysbiosis index does not distinguish children with Crohn's disease from healthy siblings.** United European Gastroenterology Week