

Yann Ilboudo

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EDUCATION

Doctor of Philosophy (Ph.D) in Bioinformatics 01/2020 - Present

Master of Science (M.Sc.) in Bioinformatics 01/2015 – 03/2017

Thesis Title: “The genetics of red blood cell density, a biomarker of clinical severity in sickle cell disease.”

Department of Biochemistry and Molecular Medicine

GPA 3.4/4.3

University of Montréal, Canada

Bachelor of Science (B.Sc.) in Bioengineering 09/2007 – 05/2011

GPA 3.1/4.0

Binghamton University, State University of New York, USA

CORE SKILLS

Software: Python • R • Bash • AWK • Perl • Git • Linux • LaTeX • R/Markdown • Bioconductor • Mathematica • High Performance Computing • Microsoft suite (Excel, Word, PowerPoint, etc..)

Research: Bioinformatics, Metabolomics, Genomics, Transcriptomics

Languages

- French (Native proficiency in reading and writing)
- English (Native proficiency in reading and writing)
- Italian (Full professional proficiency in reading and writing)
- Spanish (Elementary proficiency in reading and writing)

PROFESSIONAL EXPERIENCES & PROJECTS

Research assistant in Bioinformatics 03/2017–01/2019

Montreal Heart Institute, Montreal, QC, Canada

Metabolomics projects

- Implemented a mendelian randomization analysis pipeline in *Python* to identify the causal role of metabolites in sickle cell disease patients
- Performed clustering analysis with *WGCNA*, developed a wrapper in *R* to facilitate the analysis
- Developed a *Python* script to efficiently parse the *XML* Human Metabolome Database (HMDB) in order to perform metabolite annotation
- Wrote projects results and methods in R Markdown

Genomics projects

- Developed a pipeline to perform genome-wide association (GWAS) studies for multiple phenotypes outputting tables, and figures
- Performed whole exome sequencing quality control and analysis with *GATK* and *VEP*

SCHOLARSHIPS & AWARDS

- Developed a *Python* script to integrate and harmonize results from GWAS, with those from gene expression (RNA-Seq), and genome editing (CRISPR)

MERITE scholarship by faculty of Medicine at the University of Montreal. 09/2020 – 09/2022

- Awarded by the department of medicine based on a yearly competition to the most deserving students based on a rigorous evaluation from university professors
- \$60,000 CAD/year

FESP Scholarship by the University of Montreal 05/2015 – 05/2016

- Granted to international students during their Master studies for excellent academic records
- Additionally received for one year “la bourse d’exemption des droits scolarité supplémentaires pour étudiants internationaux” (Scholarship for exemption of tuition fees for international students)
- \$13,062.7 CAD/year

LEADERSHIP & VOLUNTEERING**Honour: Professional Schools Student Speakers****at Binghamton University Commencement Ceremony** 05/2011

- Commencement speech to over 1000 graduating students, relatives and faculty
- Available on Youtube (“Binghamton Commencement 2011 Professional Schools Student Speaker”)
- Interview process for selection

Trained Bioinformatics Summer Intern**Montreal Heart Institute**

05/2019 – 08/2019

- Designed a bioinformatics project for an undergraduate student
- Provided guidance on acquiring skills in R programming, metabolomics data quality control, and imputation
- Reviewed final report

External Vice President of the Bioinformatics Students Association of the Université de Montreal

10/2015 – 03/2017

- Responsible for external student activities
- Organized a career event for bioinformatics graduate and undergraduate student
- Represented the biochemistry department and advised prospective students during open university day 2016 (“Portes ouvertes Hiver 2016 à l’UdeM”)

Co-organizer of the University of Montreal Eureka Festival 06/2015

Organized an educational scientific activity : Presented the basis of computer programming and developed a video game in NETLOGO software with > 30 children aged 3 – 14

**PEER-REVIEWED
PUBLICATIONS**

AV Mikhaylova, CP McHugh, LM Polfus, LM Raffield, MP Boorgula, TW Blackwell, JA Brody, J Broome, N Chami, [...] **Ilboudo Y** [...] Mathias RA; NHLBI Trans-Omics for Precision Medicine (TOPMed) Consortium, AP Reiner, PL Auer (2021). Whole-genome sequencing in diverse subjects identifies genetic correlates of leukocyte traits: The NHLBI TOPMed program. Am J Hum Genet

DH Vandorpe, BE Shmukler, **Y Ilboudo**, S Bhasin, B Thomas, A Rivera, JG Wohlgenuth, JS Dlott, LM Snyder, C Sieff, M Bhasin, G Lettre, C Brugnara, SL Alper (2021). A Grammastola spatulata mechanotoxin-4 (GsMTx4)-sensitive cation channel mediates increased cation permeability in human hereditary spherocytosis of multiple genetic etiologies. Hematologica

T Pincez, SSK Lee, **Y Ilboudo**, MH Preuss, AL Pham Hung d'Alexandry d'Orengiani, P Bartolucci, F Galacteros, P Joly, DE Bauer, R Loos, RC Lindsley, G Lettre (2021). Clonal hematopoiesis in sickle cell disease. Blood

Y Ilboudo, ME Garrett, P Bartolucci, C Brugnara, C Clish, JN Hirschhorn, F Galactéros, A Ashley-Koch, M Telen, G Lettre (2020) Potential causal role of L-glutamine in sickle cell disease painful crises: a Mendelian randomization analysis. Blood Cells Mol Disease 86:102504

**SCIENTIFIC
PRESENTATIONS**

Y Ilboudo, P Bartolucci, ME Garrett, A Ashley-Koch, M Telen, C Brugnara, F Galactéros, G Lettre (2018) A common functional PIEZO1 deletion allele associates with red blood cell density in sickle cell disease patients. American Journal of Hematology E362-E365

Y Ilboudo, P Bartolucci, A Rivera, JC Sedzro, M Beaudoin, M Trudel, SL Alper, C Brugnara, F Galacteros, G Lettre (2017) Genome-wide association study of erythrocyte density in sickle cell disease patients. Blood Cells Mol Disease 65:60-65.

MC Canver, S Lessard, L Pinello, Y Wu, **Y Ilboudo**, EN Stern, A Needleman, F Galactéros, C Brugnara, A Kutlar, C McKenzie, M Reid, DD Chen, PP Das, AM Cole, J Zheng, Y Nakamura, G Yuan, G Lettre, DE Bauer, SH Orkin (2017) Variant-aware saturating mutagenesis using multiple Cas9 nucleases identifies regulatory elements at trait-associated loci. Nature Genetics 49(4):625-634.

Y Ilboudo, M Garret, P Bartolucci, F Galactéros A Ashley-Koch, Telen M, G Lettre. (poster presentation) Causal role of L-glutamine and 3-ureidopropionate in sickle cell disease complications: A Mendelian randomization analysis. **American Society of Human Genetics Annual Meeting**, Houston, TX, USA, October 2019

Y Ilboudo, M Garret, A Ashley-Koch, Telen M, G Lettre (poster presentation) Metabolite signatures of organ dysfunction in sickle cell disease patients. **RECOMB/ISCB Conference on Regulatory and Systems Genomics**, New York City, NY, USA, December 2018

Y Ilboudo, M Garret, A Ashley-Koch, Telen M, G Lettre (poster presentation) Metabolite signatures of organ dysfunction in sickle cell disease patients, **12e journées génétiques du Réseau de médecine génétique appliquée (RMGA)**, Montreal, Canada, April 2018

Y Ilboudo, M Garret, A Ashley-Koch, Telen M, G Lettre (oral presentation) Metabolomics in Sickle Cell Disease: Searching for severity biomarkers. **Montreal Heart Institute Genetics and Functional Genomics Meeting**, Montreal, Canada, January 2018

Y Ilboudo, C Sidore, F Cucca, G Lettre (poster presentation) Trans-ethnic meta-analysis of fetal hemoglobin genome-wide association results identifies common variants at the KLF1 locus. **American Society of Human Genetics Annual Meeting**, Orlando, FL, USA, October 2017

Y Ilboudo, C Sidore, F Cucca, G Lettre (oral presentation) The discovery of genetic loci associated with fetal hemoglobin levels in sickle cell disease patients through epigenomic prioritization. **Journée de la Recherche - Institut de Cardiologie de Montréal**, Montreal, Canada, June 2017

Y Ilboudo, P Bartolucci, SL Alper, C Brugnara, F Galacteros, G Lettre (oral presentation) The importance of red blood cells hydration in sickle cell disease patients. **Seminaire Institut de Cardiologie de Montréal**, Montreal, Canada, November 2016

Y Ilboudo, P Bartolucci, F Galactéros, S Alper, C Brugnara, G Lettre (poster presentation) The genetics of dense red blood cells in sickle disease patients. **American Society of Human Genetics Annual Meeting**, Vancouver, Canada, October 2016