

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

**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

**Moniteur de recherche** 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*

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

## SCHOLARSHIPS & AWARDS

### **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

### **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

## LEADERSHIP & VOLUNTEERING

### **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”)

**Volunteer at the Quebec Sickle Cell Association**

(“Association de l’Anémie Falciforme du Québec”) 08/2015 – 02/2017

- Digitized the medical records of patients
- Identified effective ways to transfer large sets of secure data between databases

**Crisis Team Member & Theme Guide Writer at the Montreal Division of the World Health Organization (MonWHO)** 09/2015 – 03/2016

- Conducted and wrote a case study on the stigma of sickle cell disease among young adults for the 2016 Theme Guide
- Wrote and edited storylines for the MonWHO 2015 conference

**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

**Volunteer at the Columbia University Toolkit for Data Scientists and Entrepreneurs, NY, USA** 10/2013

Set up and facilitated a 2-day workshop by Software Carpentry with approx. 30 participants, covering topics such as “command line”, “version control with Git”, “Intro to Python”, and SQL

**PEER-REVIEWED PUBLICATIONS**

**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

**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.

**SCIENTIFIC  
PRESENTATIONS**

**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