Christopher Cole

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Fourth year undergraduate CO-OP Biomedical Science student specializing in biostatistics seeking graduate positions in statistical genetics, mathematics, and bioinformatics.

Education

- **Honours B.Sc. in Biomedical Science** — **University of Ottawa**
  Undergraduate:, Specialization in Biostatistics, CO-OP. — *2012 – Exp. Grad. 2017*

Technical Skills

- **Programming Languages:** R, MATLAB, Python, Unix Shell, BASH, RegEx, Julia, SQL, Perl, LaTeX, (R)Markdown
- **Programs:** MEGA Software 5.05, FastTree, BLAST, PLINK, Eigensoft, METAL, GCTA, BIMBAM, GWAMA, OXSTATGEN Suite (IMPUTE2, QCTOOLS, GTOOLS, SNPTEST2, META), PBS, Sun Grid Engine, HAPGEN2
- **Environments:** Extensive experience in *nix command-line environments. Extensive experience in cluster environments and parallel computing on large data sets in SGE and PBS.

Research Experience

- **Statistical Genetics Group** — **Dr. Jo Knight**
  Centre for Addiction and Mental Health, Toronto, ON — *January 2015 – August 2015*

  Utilize cutting edge mathematical and computational techniques to further the understanding of the human genome, especially relating to genome-wide association studies (GWAS) and multiple testing correction. Construct and design bioinformatics pipelines integrating multiple information sources.

- **Ruddy Canadian Cardiovascular Genetics Centre** — **Dr. Ruth McPherson**
  The University of Ottawa Heart Institute, Ottawa, ON — *May 2013 – Present*

  Planned and executed multiple independent, first author studies, on a wide array of mediums including linux, unix, and ms-dos. Delved into regression mechanics, large data set analysis, Genome Wide Association Studies (GWAS), Bayesian statistics, program design and optimization, MPI, and pipeline design.

- **Aris-Brosou Laboratory** — **Dr. Stephane Aris-Brosou**
  University of Ottawa, Ottawa, ON — *September 2012 – May 2013*

  Learned and used the R programming language to discover novel predictors of the emergence of influenza viruses through stochastic genetic network generation in order to create and use a rejection algorithm based on Bayesian inference in phylogenies. Designed and used Monte-Carlo simulation, Barabasi simulation, Erdos Renyi simulation, Forest Fire simulation, and Watts Strogatz simulations to test the efficacy of differing descriptive statistics in modeling and observing networks.

Publications

1. **Cole, C. B.**, Nikpay, M., Lau, P., Stewart, A. F. R., Davies, R. W., Wells, G. A., ... McPherson, R. (2014). Adiposity Significantly Modifies Genetic Risk for Dyslipidemia. Journal of Lipid Research. doi:10.1194/jlr.P052522

2. **Christopher B Cole**, Majid Nikpay, Ruth McPherson. (2014). Gene–environment interaction in dyslipidemia. Current Opinions in Lipidology. doi: 10.1097/MOL.0000000000000160
3. **Christopher B Cole**, Majid Nikpay, George Wells, Ruth McPherson. (2015). Increased Genetic Risk for Obesity in Premature Coronary Artery Disease. European Journal of Human Genetics (EJHJ). doi:10.1038/ejhg.2015.162
4. Nuwan C. Hettige, **Christopher B. Cole**, Sarah Khalid, Vincenzo De Luca. (2015). Polygenic Risk Score Prediction of Antipsychotic dosage in Schizophrenia. Schizophr Res. doi: 10.1016/j.schres.2015.12.015

Selected Awards and Anchievements

- **Elevator Pitch Presentation First Place** **$75 CAD**
  University of Ottawa Healthcare Symposium *January 23, 2016*
  First place 5 minute elevator pitch for research, unanimous vote by four independant judges.
- **Early Career Investigator Award** **$500 USD**
  University of Toronto McLaughin Centre *August 2015*
  Travel scholarship with access to mentorship program at the World Congress for Psychiatric Genetics 2015.
- **Summer Undergraduate Program Funding** **$4,800 CAD**
  University of Toronto Institute of Medical Science *April 2015 – August 2015*
  Selected to be part of the University of Toronto's IMS SURP program for the summer of 2015. Granted access to weekly seminars, networking opportunities, and poster day
- **Poster & Publication Award**
  Canadian Society of Epidemiology and Biostatistics *May 2014*
  Selected among the 250 presentations at the Canadian Society of Epidemiology and Biostatistics National Student Conference at McMaster University as one of the top 25 presenters. Entitled to publication of abstract in the Journal of Epidemiology and Community Medicine.
- **Comp. Bio. Undergraduate Summer Student Health Research Award** **$6,250 CAD**
  Institute of Genetics, Canadian Institutes of Health Research *May 2014 – Semptember 2014*
  Top 5 Applicant; ranked "Outstanding" by selection committee. Awarded to 20 Undergraduates across Canada for Research Excellence in Computational Biology.
- **Entrace Scholarship** **$12,000 CAD**
  University of Ottawa *September 2012*
  Entering average of 90% or higher.

Published Abstracts & Non-Refereed Publications

1. Shifman, A., **Cole, C. B.** The Best and the Sneakiest. Minimizing the cost associated with false publication histories. Proceedings of the National Institute of Science. HARD (2015).
2. **Christopher B. Cole**, Joanne Knight. "coR-ge: Investigation of Stratified False Discovery Rate Control in Environments of Complex Correlation", Proceedings of World Congress of Psychiatric Genetics.
3. Nuwan Hettige, **Christopher B. Cole**, Vincenzo De Luca. "A Polygenic Risk Analysis for Antipsychotic Dosage Using Genomewide Significant Markers for Schizophrenia"
4. **Christopher B. Cole**, Joanne Knight. "coR-ge: Investigation of Stratified False Discovery Rate Control in Environments of Complex Correlation", Proceedings of the Institute of Medical Science Undergraduate Research Day
5. **Christopher B. Cole**, Joanne Knight. "coR-ge: Investigation of Stratified False Discovery Rate Control in Environments of Complex Correlation", Proceedings of Compute Canada's High Powered Computing Symposium.
6. **Cole, C. B.**, Nikpay, M., Lau, P., Stewart, A. F. R., Davies, R. W., Wells, G. A., ... McPherson, R. (2014). Adiposity Significantly Modifies Genetic Risk for Dyslipidemia. Journal of Epidemiology and Community Health. doi:10.1136/jech-2014-205217.7

7. "Genetic Predisposition for Hypertriglyceridemia is Modified by Extremes of Adiposity", **C.Cole**, M. Nikpay, R. Dent, R. McPherson, 2013, in the proceedings of The American Society of Human Genetics, Boston, 2013. 860F
8. "Obesity Exacerbates Genetic Predisposition for Hypertriglyceridemia", **Christopher Cole**, Majid Nikpay, Mary-Ellen Harper, Robert Dent, Ruth McPherson, in Proceedings of the Obesity Society, Atlanta, 2013, T-645-P

Conference Presentations

1. "Predicting Complex Disease Risk through Machine Learning and Optimal Polygenic Risk Scores", University of Ottawa Healthcare Symposium, Ottawa, ON, January 23, 2016. **Oral Presentation - Best Presentation**.
2. "coR-Ge: Investigation of Stratified False Discovery Rate Control in Environments of Complex Correlation", World Congress of Psychatric Genetics, Toronto ON, Oct 16-20, 2015. Sa33, **Poster**.
3. "Interactive Visualization with R: New Opportunities and Old Challenges", Center for Addiction and Mental Health Peers Teaching Peers (PTP) Tutorial Series, Toronto ON, August 8th 2015, **Invited Lecture**.
4. "coR-ge: Investigation of Stratified False Discovery Rate Control in Environments of Complex Correlation", Institute of Medical Science Undergraduate Research Day, Toronto ON, August 21st 2015, Poster A8. **Poster**.
5. "coR-ge: Investigation of Stratified False Discovery Rate Control in Environments of Complex Correlation", Compute Canada's High Powered Computing Symposium, Montreal QC, Jun 15-19th 2015, Poster 6. **Poster**.
6. "Investigation of Stratified False Discovery Rate Control in Environments of Complex Correlation", Harvey Stancer Research Day, Toronto ON, Genetics. **Oral Presentation**.
7. Canadian Society for Epidemiology and Biostatistics National Student Conference, Hamilton, Ontario, May 9-10 2014. **Poster**.
8. University of Ottawa Healthcare Symposium, Student Poster Competition, Ottawa, ON, March 29 2014. **Poster**.
9. "Genetic Predisposition for Hypertriglyceridemia is Modified by Extremes of Adiposity", American Society of Human Genetics Annual Meeting, Boston MA, Oct 22-26 2013. 860F. **Poster**.

Open Source Software

- **coR-ge**: Software for the Examination of Multiple Correction Methodologies in Accurate Genomic Environments in R.
- **mineR**: Identification of key classifications based on a dictionary and word matching in R.
- **Bandwidth Daemon:** Retrieval and display of bandwidth information from ISP's API through SMTP in Python.

Volunteer Work

- **Pro-Bono Consultant** **Ottawa**
  Statistics Without Borders, ON *September 2014 – Present*
  Provide pro-bono private consulting and contracting in the areas of mathematics, statistics, computer science, genetics, and bioinformatics to non-profits and charities in need of assistance in humanitarian efforts. Worked and lead operations for The United Nations, AfricaRice, CorStone International, etc.

- **Director** **Ottawa**
  OneProsper International, ON *January 2013 – Present*
  Manage, lead, and direct all student initiatives of an international non-profit. Direct a team of 200+ dedicated student volunteers. Create, direct, and scale national initiatives such as Dodge For Hunger, the Changemakers' Conference, and InstaEDU.