

# KATHRYN VAILLANCOURT

438-886-2028 | kathryn.vaillancourt@mail.mcgill.ca | kathrynvailancourt.com

## EDUCATION & TRAINING

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### **McGill University**

*Doctor of Philosophy*

Studying epigenomics of cocaine dependence in the lab of Dr. Gustavo Turecki

*Master of Science*

Fast tracked to the PhD program

Montreal, QC

*Sept 2014 - Ongoing*

*Sept 2012- Sept 2014*

### **Wellcome Genome Campus**

*Certificate of Completion: Chromatin Structure and Function*

Hinxton, UK

*October 2015*

### **University of Alberta**

*Bachelor of Science*

Majors in Biological Sciences and Psychology under the supervision of Dr. Peter Hurd

Edmonton, AB

*Sept 2006-Sept 2010*

## COMMUNICATIONS ACTIVITIES

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### **The Convergence Initiative**

*Communications and Research Team*

Managing and producing website and blog content related to the intersection of neuroscience and art.

*July 2019- Ongoing*

### **Neurocrew Communications Agency**

*Molecular Psychiatry Specialist – Writer and Editor*

Neuroscience-related writing, editing and formatting services for academic and public audiences.

*June 2019- Ongoing*

### **Epigenie**

*Technical Writer*

Monthly news highlights and feature articles on epigenetics and epigenomics research.

*October 2018- Ongoing*

### **7<sup>th</sup> CHSGM/CCMG – Trainee Education Day**

*Invited Speaker*

*June 2018*

How to give a great poster presentation: The Poster Talk.

### **Massive Science Consortium**

*Member and Writer*

*May 2018 – Ongoing*

Articles for the Massive Science online publication that is geared towards scientific storytelling for the general public.

### **BiteSize Bio**

*Writer*

*March 2018 – Ongoing*

Short technical articles about laboratory skills, aimed at graduate students in molecular biology.

### **American Society of Human Genetics Trainee Newsletter**

*Writer and Editor*

*October 2017- September 2019*

Original articles on current trends in human genetics, and career development pieces for *The Nascent Transcript*

### **McGill GradLife**

*Blogger*

*Sept 2016 – June 2017*

Short articles of interest to graduate students at McGill

### **10<sup>th</sup> Annual Canadian Association for Neuroscience Meeting, Toronto, ON**

*Satellite Symposium Organizer*

*June 2016*

I developed and organized a three-hour satellite symposium titled “*Speak Up: The Role of Communication in Modern Neuroscience*”. This involved finding and coordinating with speakers, and developing content.

## **PRODUCTIONS AND EXHIBITIONS**

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### **The Renaissance Lab Podcast**

*Founder, Producer and Host*

*Sept 2019 -ongoing*

Interviews, sound editing and promotion of monthly episodes related to the intersection of science and art

## case & control

Scientific Advisor and Artist

April 2019

A hanging installation piece [exhibited](#) at the Concordia University Faculty of Fine Arts Black Box in Montreal .

## The [On Your Mind](#) Neuroscience Podcast

Founder and Host

Sept 2013 -May 2016

Development, management and promotional of weekly neuroscience content, funded by CIHR and McGill postgraduate society

> 100 episode downloads per month

## ACADEMIC PRESENTATIONS

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### Invited Oral Presentations

- Kathryn Vaillancourt, Jennie Yang, Gang G. Chen, Laura Fiori, Carl Ernst, Erin Calipari, Benoit Labonté, Eric Nestler, Deborah C. Mash, Gustavo Turecki (March 2019). Cocaine-related DNA Methylation Alters 3D Chromatin Architecture of a Neurodevelopmental Gene Cluster in Human Brain Cells. Annual McGill Biomedical Graduate Student Symposium, Montreal, Quebec, Canada (**Second Place Oral Presentation Award**)
- Kathryn Vaillancourt, et al., (June 2018). Cocaine dependence is associated with epigenetic dysregulation of the neurodevelopmental gene cluster *IRXA*. Douglas Research Center Research Day, Montreal, Quebec, Canada.
- Kathryn Vaillancourt, Gang G. Chen, Alpha Diallo, Raphael Poujol, Carl Ernst, Deborah C. Mash, Gustavo Turecki (November 2017). Methylation of the tyrosine hydroxylase (*TH*) gene is associated with cocaine dependence in humans. 4<sup>th</sup> Canadian Conference on Epigenetics, Whistler, British Columbia, Canada. (**First Place Rapid Fire Talk Award**)
- Kathryn Vaillancourt, et al., (August 2015). DNA Methylation Patterns Associated with Human Cocaine Dependence in the Dorsal and Ventral Striatum. Molecular Biology Student Symposium, Montreal, Quebec, Canada. (**First Place Presentation Award**)
- Kathryn Vaillancourt, et al., (June 2015). Genome-wide DNA methylation in the striatum of individuals with cocaine dependence. Douglas Research Center Research Day, Montreal, Quebec, Canada.

- Kathryn Vaillancourt, et al., (June 2015). Genome-wide DNA methylation in the striatum of individuals with cocaine dependence. GSAN Student Research Symposium, Montreal Quebec, Canada. **(First Place Presentation Award)**
- Kathryn Vaillancourt, et al., (May 2015). Genome-wide DNA methylation in the striatum of individuals with cocaine dependence. Young Researchers Conference, Ottawa, Ontario, Canada. **(Best Oral Presentation Award)**.

## **Poster Presentations**

- Vaillancourt, Yang, Chen, Fiori, Ernst, Calipari, Labonté, Nestler, Forne, Mash, Turecki (June 2019) Cocaine-related DNA methylation of *IRX2* alters local 3D chromatin architecture in human brain cells. Douglas Hospital Research Day. Montreal, Quebec
- Vaillancourt, et al., (May 2019) Cocaine-related DNA alters 3D chromatin architecture of a neurodevelopmental gene cluster in human brain cells. Young Researchers Conference, Ottawa, Ontario
- Vaillancourt, et al., (February 2019) Cocaine-related DNA methylation of *IRX2* alters local 3D chromatin architecture in human brain cells. NIDA (Epi)Genetics of Drug Addiction Meeting, North Bethesda, Maryland
- Vaillancourt, et al., (October 2018). DNA methylation and three dimensional chromatin structure of the *IRXA* gene cluster in human cocaine dependence. Quebec Network on Suicide, Mood Disorders and Related Disorders Research Day, Montreal, Quebec
- Vaillancourt, et al., (October 2018). DNA methylation and three dimensional chromatin structure of the *IRXA* gene cluster in human cocaine dependence. American Society for Human Genetics Annual Meeting, San Diego, California.
- Vaillancourt, et al., (September 2018). DNA methylation and three dimensional chromatin structure of the *IRXA* gene cluster in human cocaine dependence. Canadian Conference on Epigenetics, Esterel, Quebec
- Vaillancourt, et al., (September 2018). Cocaine dependence alters DNA methylation related to chromatin looping of a neurodevelopmental gene cluster in humans. EMBL Principles of Chromosome Structure and Function Meeting, Heidelberg, Germany.
- Vaillancourt, Ernst, Chen, Bramouille, Thérooux, Fiori, Maussion, Calipari, Labonté, Nestler, Mash, Turecki (October 2017). Methylation of the tyrosine hydroxylase gene (*TH*) in the striatum is associated with cocaine dependence in humans. 4<sup>th</sup> Canadian Conference for Epigenetics, Whistler, BC.

- Vaillancourt, et al., (October 2017). Gene body methylation of tyrosine hydroxylase (*TH*) in the striatum is associated with cocaine dependence in humans. American Society of Human Genetics Meeting, Orlando, FL.
- Vaillancourt, et al., (June 2017). Striatal tyrosine hydroxylase DNA methylation is associated with human cocaine dependence . CIHR Institutes of Health Research National Health Research Forum, Winnipeg, MB (**Honorable Mention**).
- Vaillancourt, et al., (May 2017). DNA methylation within the *TH* gene is associated with cocaine dependence in humans. Canadian Association for Neuroscience Meeting, Montreal, QC.
- Vaillancourt, et al., (November 2016). Differential DNA methylation in the dorsal and ventral striatum of individuals with chronic cocaine dependence. Epigenomics of Common Diseases, Hinxton, UK
- Vaillancourt, et al., (October 2016). DNA methylation in the dorsal and ventral striatum of individuals with chronic cocaine dependence: epigenetic tuning of tyrosine hydroxylase. American Society of Human Genetics Meeting, Vancouver, BC.
- Vaillancourt, et al., (October 2015). Genome-wide DNA methylation changes in the dorsal and ventral striatum of individuals with chronic cocaine dependence. American Society of Human Genetics Meeting, Baltimore, MD.
- Vaillancourt, et al., (August 2015). DNA methylation in the dorsal and ventral striatum of patients with chronic cocaine dependence. RQSHA Research Day, Montreal, Quebec
- Vaillancourt, et al., (November 2014) DNA methylation in the striatum of individuals with cocaine dependence. Society for Neuroscience Annual Meeting, Washington, DC
- Vaillancourt, et al., (September 2014). DNA Methylation in the Striatum of Dependent Cocaine Abusers. Integrated Program in Neuroscience Retreat 2014, Montreal
- Vaillancourt, et al., (May 2014). DNA Methylation in the Striatum of Dependent Cocaine Abusers. Canadian Neuroscience Meeting, Montreal
- Vaillancourt, et al., (March 2014). DNA Methylation in the Striatum of Dependent Cocaine Users. 14th Annual McGill Biomedical Graduate Conference, Montreal

- Vaillancourt, et al., (September 2013) Differential DNA Methylation in Cocaine Addiction. McGill Integrated Program in Neuroscience Retreat, Montreal
- Vaillancourt, et al., (May 2013) Differential DNA Methylation in Cocaine Addiction. Young Researchers' Conference: Mental Health for LIFE, Ottawa
- Kathryn Vaillancourt, Natalie L. Dinsdale, Peter L. Hurd. (April 2012) Estrogen Receptor Alpha Gene Polymorphism and Digit Ratio in Men. 26th Annual Royce Conference, Edmonton
- Vaillancourt, et al., (July 2010) The Effects of MAO-A and Androgen Receptor Gene Polymorphisms on Human Aggression. 14th Biennial International Amine Oxidase Workshop, Edmonton (**First Place in the Poster Competition**)

## PEER-REVIEWED ARTICLES

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- **Vaillancourt K**, Yang J, Chen GG, Calipari ES, Labonté B, Mechawar N, Ernst C, Forne T, Nestler EJ, Mash DC, Turecki G. (under review) *Cocaine-related methylation in neurons in the caudate nucleus alters the three dimensional structure of the IRXA gene cluster*. Nature Communications
- Nagy C\*, **Vaillancourt K\***, Turecki G. (2018) *A role for activity dependent epigenetics in the development and treatment of major depressive disorder*. Genes, Brain and Behaviour. 17(3):e12446
- Lutz PE, Tanti A, Gasecka A, Barnett-Burns S, Kim JJ, Zhou Y, Chen GG, Wakid M, Shaw M, Almeida D, Chay MA, Yang J, Larivière V, M'Boutchou MN, van Kempen LC, Yerko V, Prud'homme J, Davoli MA, **Vaillancourt K**, Théroux JF, Bramoullé A, Zhang TY, Meaney MJ, Ernst C, Côté D, Mechawar N, Turecki G. (2017) *Association of a History of Child Abuse with Impaired Myelination in the Anterior Cingulate Cortex: Convergent Epigenetic, Transcriptional, and Morphological Evidence*. American Journal of Psychiatry. 174(12): 1185-1194
- **Vaillancourt K**, Ernst C, Mash D, Turecki G. (2017) *DNA Methylation and Cocaine in the Brain: Progress and Prospects*. Genes. 8(5): E138
- Chen GG, Gross JA, Lutz PE, **Vaillancourt K**, Maussion G, Bramoullé A, Théroux JF, Gardini ES, Ehlert U, Bourret G, Masurel A, Lepage P, Mechawar N, Turecki G, Ernst C. (2017) *Medium throughput bisulfite sequencing for accurate detection of 5-methylcytosine and 5-hydroxymethylcytosine*. BMC Genomics. 18(1):96

- Nagy C, Maheu M, Lopez JP, **Vaillancourt K**, Cruceanu C, Gross JA, Arnovitz M, Mechawar N, Turecki G. (2015) *Effects of postmortem interval on biomolecule integrity in the brain*. Journal of Neuropathology and Experimental Neurology. 74(5):459-69
- Szatmari P, Georgiades S, Duku E, Bennett TA, Bryson S, Fombonne E, Mirenda P, Roberts W, Smith IM, Vaillancourt T, Volden J, Waddell C, Zwaigenbaum L, Elsabbagh M, Thompson A; **Pathways in ASD Study Team**. (2015) *Developmental trajectories of symptom severity and adaptive functioning in an inception cohort of preschool children with autism spectrum disorder*. JAMA Psychiatry. 72(3):276-83
- Elizabeth S. Chen, Carolina O. Gigeck, Jill A. Rosenfeld, Alpha B. Diallo, Gilles Maussion, Gang Chen, **Kathryn Vaillancourt**, Liam Crapper, Lisa G. Shaffer, Carl Ernst. (2014) *Molecular convergence of neurodevelopmental disorders*. American Journal of Human Genetics. 95(9): 490-508
- Chen G, Diallo A, Poujol R, Nagy C, Staffa A, **Vaillancourt K**, Lutz PE, Ota VK, Mash DC, Turecki G, Ernst C. (2014). *Bis-QC: An operational pipeline for multiplexed bisulfite sequencing*. BMC Genomics. 15(290)
- Duku E, Vaillancourt T, Szatmari P, Georgiades S, Zwaigenbaum L, Smith IM, Bryson S, Fombonne E, Mirenda P, Roberts W, Volden J, Waddell C, Thompson A, Bennett T; **Pathways in ASD Study Team**. (2013). *Investigating the measurement properties of the social responsiveness scale in preschool children with autism spectrum disorders*. Journal of Autism and Developmental Disorders. 43(4): 860-868
- Georgiades S, Szatmari P, Boyle M, Hanna S, Duku E, Zwaigenbaum L, Bryson S, Fombonne E, Volden J, Mirenda P, Smith I, Roberts W, Vaillancourt T, Waddell C, Bennett T, Thompson A; **Pathways in ASD Study Team**. (2013). *Investigating phenotypic heterogeneity in children with autism spectrum disorder: a factor mixture modeling approach*. Journal of Child Psychology and Psychiatry. 54(2): 206-015
- **Vaillancourt K**, Dinsdale N, Hurd P. (2012). *Estrogen receptor 1 promoter polymorphism and digit ratio in men*. American Journal of Human Biology. 24(5): 682-689
- Zaidman-Zait A, Mirenda P, Zumbo BD, Georgiades S, Szatmari P, Bryson S, Fombonne E, Roberts W, Smith I, Vaillancourt T, Volden J, Waddell C, Zwaigenbaum L, Duku E, Thompson A; **Pathways in ASD Study Team**. (2011). *Factor analysis of the Parenting Stress Index-Short Form with parents of young children with autism spectrum disorders*. Autism Research. 4(5): 366-346

- Hurd L, **Vaillancourt K**, Dinsdale N. (2011). *Aggression, digit ratio and variation in Androgen Receptor and Monoamine Oxidase A genes in men*. Behavior Genetics. 41(4): 543-556

## TEACHING AND MENTORSHIP

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### **McGill University –Introduction to Psychiatry Course (PSYT199)**

*Guest Lecturer*

*October 2019*

Development and presentation of a lesson plan introducing undergraduate students to the impact of drugs and alcohol on the brain, using multi-media, interactive and lecture-style approaches

### **ASHG and JAX labs Conference to Career Course**

*Course Ambassador- Invited*

*September 2018-June 2019*

Develop content and delivered webinar-based lectures on professional development to trainees in human genetics, including an in-person workshop at the ASHG annual meeting

### **Neuroscience Independent Research Project (NSCI 396), McGill University**

*Undergraduate Supervisor*

*September 2018-December 2018*

Led a third-year undergraduate student at McGill to develop and impellent an independent research project

### **CIHR Institute of Genetics Gene Researcher for a Week Program**

*Mentor*

*March 2016-March 2018*

Initiated our lab's involvement in the program pairing high school students with genetics research labs, and developed the learning plan

### **Mental Health Research Fair – St. Thomas High School**

*Speaker- Invited*

*April 2016*

Designed and delivered a lecture on mental health research to two classes Grade 11 students

### **BrainReach Montreal**

*Educator*

*Sept 2013 – June 2014*



Guided lectures and activities designed to encourage curiosity and foster neuroscience knowledge in students aged 14 through 17 in at-risk communities

### **Edmonton Regional Science Fair**

*Science Fair Judge*

*April 2011*

Judged local and regional science fair projects submitted by junior and high school students, and provided mentorship

### **ThinkFirst Canada**

*Brain Day Presenter*

*March 2011*

Conducted demonstrations and information sessions related to brain health in a local elementary school class.

## **AWARDS & HONOURS**

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### **Funding**

*Planning and Dissemination Grant - Institute Community Support*      Sept 2015 – March 2018  
\$10 000 provided by the Canadian Institute for Health Research (CIHR) for the On Your Mind Neuroscience podcast

*Frederick Banting and Charles Best Canada Doctoral Award*      Sept 2015 – August 2018  
\$105 000 from CIHR

*Doctoral Training Award*      Sept 2014 – August 2015  
\$60 000 provided by the Fonds de Recherche Santé Québec

*Planning and Dissemination Grant - Institute Community Support*      August 2014 – August 2015  
\$4467 from CIHR for the On Your Mind Podcast

*Frederick Banting and Charles Best Canada Master's Award*      Sept 2013 – August 2014  
\$17 500 from CIHR

*NSERC Undergraduate Research Award*      May 2010 – August 2010  
\$ 6500 provided by the National Science and Engineering Research Council (NSERC)

*NSERC Undergraduate Research Award*  
\$ 5600 from NSERC

May 2008 – August 2008

## **Awards**

<i>Genes, Brain and Behavior Top Downloaded Article 2017-2018</i>	<i>June 2019</i>
<i>IPN Star Publication Award</i>	<i>January 2019</i>
<i>EMBL Corporate Partnership Fellowship (€500)</i>	<i>September 2018</i>
<i>RQSHA Travel Award (\$1000)</i>	<i>June 2018</i>
<i>Healthy Brains for Healthy Lives Travel Award (\$1000)</i>	<i>March 2018</i>
<i>GREAT Travel Award (\$500)</i>	<i>October 2017</i>
<i>CEEHRC Travel Award (\$1100)</i>	<i>September 2017</i>
<i>Burroughs Wellcome Fund Registration Reimbursement Award (\$195)</i>	<i>August 2017</i>
<i>Wellcome Trust Epigenomics of Common Disease Bursary (£305)</i>	<i>November 2016</i>
<i>Brenda Gewurz Scholarship for Feminine Leadership (\$2500)</i>	<i>September 2016</i>
<i>GREAT Travel Award (\$500)</i>	<i>February 2016</i>
<i>Wellcome Trust Advanced Courses Bursary (£1045)</i>	<i>October 2015</i>
<i>Graduate Excellence Award (\$2000)</i>	<i>April 2014</i>
<i>Graduate Recruitment Award (\$10 000)</i>	<i>September 2012</i>
<i>Louis McKinney Post-Secondary Scholarship (\$2500)</i>	<i>September 2010</i>
<i>Jason Lang Scholarship(\$3000)</i>	<i>September 2007, 2008, 2009</i>
<i>Academic Excellence Scholarship (\$2500)</i>	<i>September 2006</i>
<i>International Baccalaureate Diploma Scholarship (\$1000)</i>	<i>September 2006</i>
<i>Faculty of Science Academic Excellence Scholarship(\$1000)</i>	<i>September 2006</i>

## **LEADERSHIP AND VOLUNTEER ACTIVITIES**

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### **CIHR Institute of Genetics and GE<sup>3</sup>LS Joint Meeting, Montebello, QC**

*Trainee Development Committee Member and Volunteer Director* September 2018-June 2019

This is an invited position. I was involved in developing the structure and content of the trainee development day held in June 2019 by the CIHR Institute of Genetics. I also consulted on the transition of the meeting undergoing new management, and coordinated volunteer activities at the three day meeting.

### **CIHR Institute of Genetics and CCMG Joint Meeting, Vancouver, BC**

*Trainee Development Committee Member*

*September 2017-June 2018*

This is an invited position. I was involved in developing the structure and content of the trainee development day held in June 2018 by the CIHR Institute of Genetics and the Canadian College of Medical Geneticists in advance of their joint scientific conference.

### **American Society of Human Genetics DNA Day**

*Essay Judge*

*September 2015 – April 2018*

I volunteer to judge essays written by high school students interested in genetics, as part of ASHG's education outreach program.

### **Douglas Student Committee for Academic Life**

*Member*

*September 2015 – August 2017*

I was involved in the formation, planning and execution of academic events for the local research community at the Douglas Mental Health University Institute.

### **Annual Canadian Human and Statistical Genetics Meeting**

*Organizing Committee and Director of Volunteers*

*April 2016-June 2017*

In addition to coordinating the volunteer committee, I created and implemented a novel trainee-focused event during the 5<sup>th</sup> annual conference in Halifax and the 6<sup>th</sup> meeting in Quebec City

### **Annual Canadian Human and Statistical Genetics Meeting**

*Assistant Director of Volunteers*

*May 2014-May 2015*

I supported the volunteer committee at the 3<sup>rd</sup> and 4<sup>th</sup> Canadian Human and Statistical Genetics Meeting, hosted by the CIHR Institute of Genetics, in Victoria and Vancouver, respectively.

Tasks included coordinating speakers and assisting in symposium set-up, delegate registration and management, and general troubleshooting throughout the 3 day conference.

### **University of Alberta Student's Union**

*Orientation Leader*

*September 2009*

I lead a group of incoming undergraduate students through campus tours and information seminars over a two day period.

I answered student questions, directed them to resources and provided insight on undergraduate student life.

## WORK EXPERIENCE

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### **Glenrose Rehabilitation Hospital**

Edmonton, AB

*Research Assistant – Autism Research Center*

*July 2010- August 2012*

Coordinated and managed the data collection of multiple longitudinal studies investigating clinical and behavioral outcomes of children with ASDs.

Performed psychometric assessments and prepared psychological reports for children with ASDs.

### **University of Alberta**

Edmonton, AB

*Research Assistant – Hurd Lab*

*September 2010 – July 2012*

Directed and managed projects in behavioral genetics, collected and analyzed data relating genetic polymorphisms to personality and behavior traits in humans.