

Name:** David St-AmandTerm:** Autumn 2020-2021***Program:** Neurosciences PHD***Degree:** PHD

Specialization:

Interest 1:

Interest 2:

Interest 3:

Fellowship/Assistantship Interest: Yes

Stanford Knight-Hennessy Scholars Application Number:

***Mailing Address, Phone (Valid Until 09-01-2020)**

3484 Stanley app 410

Montreal, Quebec, H3A 1S1, Canada

Preferred Contact #: +1 438 497-3540

Email:** david.st-amand@mail.mcgill.ca Home Address, Phone**

3484 Stanley app 410

Montreal, Quebec, H3A 1S1, Canada

Cell: +1 438 497-3540

***Institution(s) Previously Attended**

MCGILL UNIVERSITY

WEST MONTREAL, QC

Degree: Bachelor of Science

Attendance: 09-2014 to 05-2017

Country: Canada

Field: Honours psychology

GPA: 3.80

Degree Date: 10-2017

Orig. GPA Scale:

Orig. GPA:

MCGILL UNIVERSITY

WEST MONTREAL, QC

Degree: Master of Science

Attendance: 09-2017 to 08-2020

Country: Canada

Field: Neuroscience

GPA: 3.90

Degree Date: 10-2020

Orig. GPA Scale:

Orig. GPA:

Country:

Field:

GPA:

Degree:

Degree Date:

Attendance: to

Orig. GPA Scale:

Orig. GPA:

Country:

Field:

GPA:

Degree:

Degree Date:

Attendance: to

Orig. GPA Scale:

Orig. GPA:

Test Scores (if applicable)**TOEFL:**

Type:	Total:	Taken:	Future:	
Listening:	Reading:	Writing :	Speaking:	Taken:

***Citizenship Country/Status:** Canada / Non-Citizen

Birth Date: 08-27-1995 Birth Country: Canada

Visa Type:

Registered Perm. Res Number: Number

***Gender:** Male

Gender Identity:

Ethnicity/Race:**Hispanic or Latino (y/n):** N

Ethnicity 1:	Ethnicity 2:
Ethnicity 3:	Ethnicity 4: White - Europe
Ethnicity 5:	Ethnicity 6:

***References (three required)**

Name: Curtis Baker at McGill University

Email curtis.baker@mcgill.ca +1514 934 1934 ext.43819

Name: Ross Otto at McGill University

Email ross.otto@mcgill.ca +1 514 398 6109

Name: David Ostry at McGill University

Email david.ostry@mcgill.ca +1 514 398 6111

Name: at

Email

Name: at

Email

Name: at

Email

***Stanford History**

Prev. Applied Prog.:

Academic Year:

Prev. Enrolled Prog.:

Last Enrolled Date:

Stanford ID:

Changes to Academic Qualifications since Last Application**Language Background**

*First Language: French

Other Languages

Reading

Writing

Speaking

English

Fluent

Fluent

Fluent

Stanford Faculty Consulted Regarding Application**Date****Also Applying to These Graduate Schools**

Massachusetts Institute of Technology;
University of California, Berkeley;
New York University;
Johns Hopkins;

Non-Stanford Financial Aid, Fellowships, Scholarships

Scholarship/Fellowship Title	Awarded	Awarded for Graduate Study

Application Options

PhD Applicant consider for Masters? No OK to refer to another department? Yes

HCP?

HCP Sponsor Company:

Employment or Professional Activity	From	To
Employer: David Ostry	05-2017	08-2017
Position/Title: Research / Research Assistant		
Employer: David Ostry	05-2016	08-2016
Position/Title: Research / Research Assistant		
Employer:		
Position/Title:		

Other Name

First Name

Middle Name

Last Name:

Additional Test Scores**Additional Academic Interests**

Computational neuroscience
Visual neuroscience
Hippocampus and memory
Electrophysiology

Additional Educational History**Honors, Fellowships, Non-Academic Distinctions, Publications**

St-Amand, D., Sheldon, S., & Otto, A. R. [2018]. Modulating episodic memory alters risk preference during decision-making. *Journal of cognitive neuroscience*, 30[10], 1433-1441.;

2018-2019: McGill Internal Program in Neuroscience [IPN] internal award;

2017: McGill Student Undergraduate Research Award [SURA];

Contributing Factors to Stanford Community**Parent or Guardian Occupation and Level of Education**

Occupation: Engineer

Job Title: Electrical engineer

Employer: Hydro-Quebec

Highest level of post-secondary education completed: Bachelor's Degree

Occupation: Biologist

Job Title: Biologist

Employer: MAPAQ

Highest level of post-secondary education completed: Master's Degree

United States Military or Veteran Status

Probation, suspension, expulsion by Post-secondary school or program No

*Prior Convictions No

***Consent**

By submitting this application, I hereby consent to Stanford University's collection and processing of any sensitive personal data contained in my application to evaluate my application for the other purposes described in Stanford University's Online Privacy, Offline Privacy Policy, and the Privacy Notice for Admissions and Financial Aid which can be found at <https://privacy.stanford.edu/>.

 X I agree

Date: 12-03-2019

***Application Submission**

I hereby apply for admission to graduate study at Stanford University and certify that the information I have provided in my application (including my statement of purpose) is complete, accurate and my own work. I have submitted only one application for admission to graduate study at Stanford for the requested academic year indicated on this application.

I further acknowledge that if I am offered admission, Stanford reserves the right to withdraw that offer of admission if: (1) there is a significant drop in my academic performance or failure to graduate; (2) there is a misrepresentation in the application process; or (3) the University learns that I have engaged in behavior prior to the first day of enrolled attendance that indicates a serious lapse in judgement or integrity.

I authorize the educational testing service (ETS) to share individual information with Stanford concerning any examination relating to this application. And I agree that Stanford has the right to require me to provide additional information (and/or authorization for the release of information) about any matter relating to my application.

 X I agree

Date: 12-03-2019

Biosciences Ph.D. Admissions Supplemental Form

Name: St-Amand David Email: david.st-amand@mail.mcgill.ca
Last First Middle

Home Program Selections:

1. Neurosciences PHD 2. Biomedical Informatics 3.

Biology: Biology Ph.D. Interest:

Cancer Biology: Cancer Systems Biology Track Interest:

Immunology: Computational and Systems Immunology Track Interest:

Neurosciences: Type(s) of Neurosciences Research Performed: [Neurosciences] Systems

Neurosciences: Type(s) of Neurosciences Research Most Likely During Graduate School: [Neurosciences] Systems

Faculty of Interest:

Dan Yamins;
Surya Ganguli;
Anthony Wagner;
Kalanit Grill-Spector;
Brian Knutson;
Scott Linderman;
Tom Clandinin;
Shaul Druckmann;

Significant Research Project:

I am currently doing graduate research with Curtis Baker at McGill university on a project entitled "ON inhibition underlies stronger V1 responses to darkness". My project combines electrophysiology with machine learning to better understand how different inputs drive V1 responses. We predict recorded responses of V1 neurons to natural images with a biologically-inspired convolutional neural network which, like the early visual system, separately processes light [ON] and dark [OFF] information in two parallel pathways. This fitting procedure allows us to infer the amount of excitation and inhibition each neuron receives from both pathways. Using this approach, we show V1 neurons to receive much more ON inhibition than the three other types of inputs, especially at earlier time lags. These results explain why most V1 neurons are more driven by dark than by light stimuli [Yeh et al., 2009], and why V1 responses to dark are faster than to light stimuli [Komban et al., 2014].

Months of Current/Prior Research Experience: 35

Describe an Interesting Biological or Biomedical Problem:

For my PhD, I want to better understand how neurons' receptive fields are built from spike-time-dependent plasticity [STDP] learning rules. We have a good grasp of how connections between different types of neurons can be strengthened or weakened. However, our understanding of how such learning rules shape and improve cortical networks is still relatively poor. I would like to combine biologically inspired unsupervised learning algorithms with natural images to replicate the center-surround receptive fields of retinal ganglion cells and the orientation selectivity of V1 cortical neurons. I would also be interested to simulate STDP in hippocampal structures to better understand how this system encodes space and memory. I believe such simulations would help us understand how neurons become efficiently wired to process information.

Foundations of Graduate Study:

Responses to the following questions are only expected for those applying to Biomedical Informatics, Stem Cell Biology and Regenerative Medicine and the Computational/Systems Tracks Cancer Biology and Immunology, but others may respond as well.

For each of the following areas, please describe your experience, as acquired through coursework, research, or other projects, or your plans for obtaining or expanding such experience, ideally before starting your Ph.D.

Multivariate mathematics (including calculus and linear algebra):

I have taken calculus 1, calculus 2 and linear algebra 1. I have continued to learn linear algebra on my own, in order to better understand statistics and machine learning.

Probability and statistics:

I have developed a solid statistics background through both courses and academia. The basis of my knowledge in statistics comes from three mathematical statistics course I have taken at McGill University: "Probability", "Statistics" and "Regression and analysis of variance". These courses taught me the theory and proofs behind the main statistical tests used in research. I have further deepened my statistical knowledge by learning logistic regression and generalized linear models [GGLMs] on my own.

I have used this knowledge to tutor statistics to McGill students part-time for a year. I have also taught two graduate-level workshop on how to use R for statistical analyses.

Computation, including fundamentals of computer science and software engineering:

I've taken an introductory class to Java in my first semester of undergraduate studies. Since then, I've been keen to keep improving my programming skills. I have learned both R and python in order to become a more efficient researcher, especially when it comes to data analysis. In my last semester of undergraduate studies, I've challenged myself by taking a graduate-level computer science class on machine learning. I've learned a great deal from this class and decided to apply what I have learned to my graduate research. During my master's degree, I have designed biologically inspired convolutional neural networks in Tensorflow to better understand electrophysiological responses in V1.

Honors, Awards, Posters, Presentations, and Publications:

Honors and Awards:

2018-2019: McGill Internal Program in Neuroscience [IPN] internal award;
2017: McGill Student Undergraduate Research Award [SURA];

Posters:

"ON-afferent inhibition underlies stronger V1 responses to dark" poster at the Society for Neuroscience [SFN] 2019 conference;
"ON-afferent inhibition underlies stronger V1 responses to dark" poster at the Montreal Artificial Intelligence and Machine learning [MAIN] 2019 conference;

Presentations:

Oral presentation at McGill's 2019 Biomedical and Bioengineering symposium entitled "System identification of single primary visual cortex neurons using machine learning";

Publications:

St-Amand, D., Sheldon, S., & Otto, A. R. [2018]. Modulating episodic memory alters risk preference during decision-making. Journal of cognitive neuroscience, 30[10], 1433-1441.
Authors: David St-Amand, Ross Otto and Signy Sheldon. I am the first author.
Title: Modulating episodic memory alters risk preference during decision-making
Status: Published.