Program Objectives

To provide students with:

- a broad and advanced exposure to cellular/molecular, cognitive/behavioral, & systems neuroscience;
- an undergraduate path into graduate studies;
- preparation for neuroscience related careers in academia, hospitals, or industry.
Why was the program created?

- Due to increased need/demand
  - pressing scientific challenges
    - 1 in 3 Canadians will be affected by a brain or nervous system disorder.
  - opportunity
    - $61 billion annually spent on neurological and mental health disorders in Canada (Canadian Brain Research Strategy)
    - increase in enrollments in Neuroscience programs in Ontario between 2009-2017.
  - interest by our students
    - 60% of York undergraduate survey respondents were somewhat or very interested in an undergraduate Neuroscience program
  - trained undergrads needed by researchers
- Increase enrollments in the Faculties of Science and Health
- Contribute to research intensification
- Increase undergraduate student quality
Why Kinesiology, Psychology, & Biology?

Interdisciplinary component between Science and Health

- course work and research integrates multiple disciplines
- consistent with other neuroscience programs.
Proposing: “Three pathways” program model

First cohort – Admission September 2020 to:

Faculty of Health
- Neuroscience - School of Kinesiology & Health Science
  OR
- Neuroscience - Department of Psychology
  OR

Faculty of Science
- Neuroscience - Department of Biology
Admission Requirements

• Grade 12 performance (approx. 80%) based on 4 compulsory courses:
  – 12U Advanced Functions, Biology, Chemistry, and English

Note: Fall intake cap will be approximately 70 students.
  – Proportions of capped enrollment will be allotted among Psychology, Kinesiology & Health Science, and Biology.

• Secure spot in Neuroscience program beginning in 2nd year but students must:
  – complete required number of 1st year credits (27) and
  – maintain specified overall GPA (7.5) in 1st year
## Summary of Degree Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credit</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 1000 3.00</td>
<td>Biology I</td>
<td>3</td>
<td>exists</td>
</tr>
<tr>
<td>BIOL 1001 3.00</td>
<td>Biology II</td>
<td>3</td>
<td>exists</td>
</tr>
<tr>
<td>PSYC 1010 6.00</td>
<td>Introduction to Psychology</td>
<td>6</td>
<td>exists</td>
</tr>
<tr>
<td>NRSC 1001 1.00</td>
<td>Frontiers of Neuroscience</td>
<td>1</td>
<td>new</td>
</tr>
<tr>
<td>NRSC 2000 3.00</td>
<td>Fundamental Molecular and Cellular Neuroscience</td>
<td>3</td>
<td>new</td>
</tr>
<tr>
<td>NRSC 2100 3.00</td>
<td>Systems, Behavioural and Cognitive Neuroscience</td>
<td>3</td>
<td>new</td>
</tr>
<tr>
<td>NRSC 2200 3.00</td>
<td>Neuroscience Techniques</td>
<td>3</td>
<td>new</td>
</tr>
<tr>
<td>PSYC 2021 3.00 or</td>
<td>Statistics*</td>
<td>3</td>
<td>exists</td>
</tr>
<tr>
<td>BIOL 2060 3.00 or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KINE 2050 3.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NRSC 3000 3.00</td>
<td>Molecular and Cellular Neurobiology</td>
<td>3</td>
<td>new</td>
</tr>
<tr>
<td>PSYC 3250 3.00</td>
<td>Neural Basis of Behaviour</td>
<td>3</td>
<td>exists</td>
</tr>
<tr>
<td>KINE 3650 3.00</td>
<td>Functional Neuroanatomy</td>
<td>3</td>
<td>exists</td>
</tr>
<tr>
<td>NRSC 4000 6.00 or</td>
<td>Neuroscience Capstone</td>
<td>6</td>
<td>new</td>
</tr>
<tr>
<td>NRSC 4002 6.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chosen Specialized stream</td>
<td>12</td>
<td>exists</td>
</tr>
<tr>
<td></td>
<td>Alternative Specialized stream</td>
<td>12</td>
<td>exists</td>
</tr>
<tr>
<td><strong>Total Credits:</strong></td>
<td></td>
<td><strong>64</strong></td>
<td></td>
</tr>
</tbody>
</table>
Example Degree Requirements: First & Final Year

First year: keystone experience *Frontiers of Neuroscience (NRSC 1001 1.00)*
- Purpose:
  - build a cohort of students
  - familiarize students with breadth of research
  - begin to learn about the purpose and function of research ethics

Final year: capstone experience *Individual/Team Research project (NRSC 4000/4002 6.00)*
- Purpose
  - integrate knowledge and apply research skills to contribute to an existing body of knowledge
  - practice/develop research citizenship (display autonomy & professional capacity)
  - practice and refine written and oral communication skills
  - Critically reflect on experience
Key Differentiators

• Alignment of the neuroscience program level objectives with **measurable** course learning outcomes

• Experiential education
  – One minute paper, interviews (e.g., NRSC 1001)
  – critical reflections (e.g., NRSC 1001, 3000, 4000/4002)
  – research and/or laboratory participation (e.g., NRSC 4000/4002)
  – case studies (e.g., NRSC 2100)
  – journal article critiques (e.g., NRSC 2000, 2002)

• Technology enhanced learning/elearning
  – proposed flipped or blended course models, proactive use of LMS
  – simulations to see processes occur (e.g., NRSC 2000, 2100 2200)
  – leverage learning technologies (e.g., iClicker/REEF, mini-quizzes)
  – leverage video modules at Lynda.com (e.g., data visualization with excel, building podcasts, etc)

• Applied principles of universal design for learning
  – flexible, accessible, allow for choices
Key Differentiators cont’d

Significant faculty strengths:

- 40 faculty members conduct research in Neuroscience fields (4 Canada Research Chairs & 1 Distinguished Research Professor)
Confirmed Core Faculty

Christopher Bergevin | (Physics and Astronomy)
Steven Conner | (Biology)
Dorota Crawford | (Kinesiology & Health Science)
Doug Crawford | (Psychology) | Canada Research Chair
Joseph DeSouza | (Psychology)
Logan Donaldson | (Biology)
Mazyar Fallah | (Kinesiology & Health Science)
Ebrahim Ghafar-Zadeh | (Computer Science and Engineering)
Vinod Goel | (Psychology)
Laurence Harris | (Psychology)
Denise Henriques | (Kinesiology & Health Science)
Shayna Rosenbaum | (Psychology)
Lauren Sergio | (Kinesiology & Health Science)
Jennifer Steeves | (Psychology)
Dale Stevens | (Psychology)
Christine Till | (Psychology)
Gary Turner | (Psychology)
Niko Troje | (Biology)
Georg Zoidl | (Biology/Psychology) | Canada Research Chair
Confirmed Affiliated Faculty

Ellen Bialystok | (Psychology) | Distinguished Research Professor
James Elder | (Computer Science and Engineering)
Erez Freud | (Psychology)
Mazen Hamadeh | (Kinesiology & Health Science)
Walter Heinrichs | (Psychology)
Susan Murtha | (Psychology)
Norm Park | (Psychology)

Plus additional potential core and affiliated faculty members not yet confirmed
Thank you
Questions?