UNIVERSITY OF TORONTO

OFFICE OF THE VICE-PROVOST, ACADEMIC PROGRAMS

**FOR RECOMMENDATION** **PUBLIC** **OPEN SESSION**

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| **TO:** | Committee on Academic Policy and Programs |
| **SPONSOR:**<br>**CONTACT INFO:** | Sioban Nelson, Vice-Provost, Academic Programs<br>(416) 978-2122, vp.academicprograms@utoronto.ca |
| **PRESENTER:**<br>**CONTACT INFO:** | As above |
| **DATE:** | April 23, 2014 for May 13, 2014 |
| **AGENDA ITEM:** | 1 |

## ITEM IDENTIFICATION:

Proposal for a new graduate collaborative program in Human Development

## JURISDICTIONAL INFORMATION:

The Committee on Academic Policy and Programs approves new collaborative graduate programs and new fields in existing graduate programs. *(AP&P Terms of Reference, Section 4.4.b.iii)*

## GOVERNANCE PATH:

1. **Committee on Academic Policy and Programs** [for approval]**(May 13, 2014)**

## PREVIOUS ACTION TAKEN:

The final proposal received approval from the Faculty of Medicine Faculty Council on May 5, 2014.

## HIGHLIGHTS:

This is a proposal for a new Collaborative Program in Human Development proposed by the Faculty of Medicine which will be supported by the Fraser Mustard Institute of Human Development. The CP is intended for students enrolled in one of 13 specified doctoral programs. The proposed CP will be effective September 2014 pending approval in University governance and by the Quality Council.

The proposed Collaborative Program in Human Development is an integrative transdisciplinary initiative designed to help students understand the dynamic relationship and complex interplay between genes and environments in order to develop a holistic picture of early human development

In line with the Province's Quality Assurance Framework, the University of Toronto understands a collaborative program to be "an intra-university graduate program that provides an additional multidisciplinary experience for students enrolled in and completing the degree requirements for one of a number of approved programs. Students meet the admission requirements of and register in the participating (or 'home') program but complete, in addition to the degree requirements of that program, the additional requirements specified by the collaborative program. The degree conferred is that of the home program, and the completion of the collaborative program is indicated by a transcript notation indicating the additional specialization that has been attained." The learning outcomes of a collaborative program are in addition to those supported by the home program.

The participating programs in the proposed CP are currently:

1. Biomedical Engineering (PhD), Institute of Biomaterials and Biomedical Engineering
2. Developmental Psychology and Education (PhD), Department of Applied Psychology and Human Development (OISE)
3. Ecology and Evolutionary Biology (PhD), Department of Ecology and Evolutionary Biology, Faculty of Arts and Science
4. Immunology (PhD), Faculty of Medicine
5. Medical Science (PhD), Institute of Medical Science, Faculty of Medicine
6. Medical Biophysics (PhD), Faculty of Medicine
7. Music (PhD), Faculty of Music
8. Nutritional Sciences (PhD), Department of Nutritional Sciences, Faculty of Medicine
9. Pharmacology (PhD), Department of Pharmacology and Toxicology
10. Physiology (PhD), Department of Physiology, Faculty of Medicine
11. Psychology (PhD), Department of Psychology, Faculty of Arts and Science
12. Public Health Sciences (PhD), Dalla Lana School of Public Health
13. Social Work (PhD), Factor-Inwentash Faculty of Social Work

The CP in Human Development is expected to add value for students through the

(1) development of transdisciplinary teamwork, communication, and problem solving skills;

2) introduction to a wide range of research programs; and

(3) cultivation of translational skills (i.e. the ability to convey scientific information to non-academic audiences)

## FINANCIAL IMPLICATIONS:

Any new/additional financial obligations resulting from this program will be met at the Faculty/Divisional level.

## RECOMMENDATION:

That the Committee on Academic Policy and Programs approve:

> THAT the proposed graduate collaborative program in Human Development, as described in the attached proposal from the Faculty of Medicine dated February 2014, be approved effective for the academic year September 2014.

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## DOCUMENTATION PROVIDED:

*Cover*
*Proposal for a new Graduate Collaborative Program in Human Development*

UNIVERSITY OF TORONTO

# University of Toronto
# New Graduate PhD Collaborative Program In Human Development
# Proposal
# (Expedited Approval)

## Section 1

| | |
|---|---|
| **Name of Proposed Program:** | Collaborative Program in Human Development (CPHD) |
| **Lead Faculty / Academic Division:** | Faculty of Medicine |
| **Lead Faculty / Academic Division Contact:** | Avrum Gotlieb Vice-Dean, Graduate and Life Sciences Education, Faculty of Medicine;<br>Marla Sokolowski, Academic Director, Fraser Mustard Institute for Human Development |
| **Anticipated start date of new program:** | September 2014 |
| **Version Date:** | February 2014 |

# New Graduate Collaborative Program Proposal

**Collaborative Doctoral Program in Human Development**
**Faculty of Medicine**
**University of Toronto**

# Table of Contents

# 1 Program Rationale

The Collaborative Program in Human Development is an ambitious and integrative transdisciplinary initiative in which students will strive to understand the dynamic relationship and complex interplay between genes and environments through many perspectives in order to develop a holistic picture of early human development.

The collaborative program is the flagship educational program of its supporting unit, the Fraser Mustard Institute for Human Development. Dr. Mustard was a towering figure in the arena of early childhood development. One of his final projects was to help plan and establish the Institute for Human Development at University of Toronto. The Fraser Mustard Institute for Human Development aims to carry forward his bold vision.

Two quotes from Dr Mustard that inspire this collaborative program proposal are:

"I want professors of all disciplines to integrate the best of what we know about human development into their research, teaching and mentoring of graduate students. I want them to build new bridges between and among their disciplines that go beyond the old-fashioned interdisciplinary and multidisciplinary approaches. It is time to think "transdisciplinary" if we are to make headway in meeting tomorrow's big challenges".

" Canada's tomorrow depends on our ability to leverage what we know into policies and practices that benefit children today. Now, as never before, the knowledge needs to be harnessed to serve not just every individual in our society, but every society around the globe."

Dr. J. Fraser Mustard (1927-2011)

The healthy development of our children is at the core of our societal values. Recent evidence shows that early environments strongly influence the health and wellbeing of individuals throughout their lives. Adverse experiences in the first 2000 days after conception can "get under the skin" to affect the trajectory of human development, and can result in future morbidities such as heart disease and obesity, as well as difficulties in learning and social functioning. This biological embedding of early experiences involves a complex interplay between genes and environments; therefore, to understand fully this dynamic relationship, investigations must be approached from many perspectives to develop a holistic picture of early human development.

Keeping in mind the fundamental goal of improving the well-being of children, concomitant research is needed to elucidate novel developmental-based approaches for the promotion of healthy child development, and to ensure the successful implementation of these approaches within early education programs, family support systems, etc. This objective requires a bridge from basic research to policy and practice, which can only be constructed through an ambitious and integrative transdisciplinary initiative.

These harmonized aims of discovery and translation comprise the core mandate of the Fraser Mustard Institute for Human Development (FMIHD), and inform the primary objectives of the proposed Collaborative Program in Human Development: (1) To inspire and facilitate

collaborative research in early human development, and in other fields from which knowledge will inform our understanding of early human development; (2) To encourage and cultivate in students the ability to work across disciplinary boundaries; (3) To instil in students both the desire and the necessary skills to translate knowledge of early human development into tangible results for children.

The Collaborative Program in Human Development was developed in a series of meetings of the Academic Steering Committee of FMIHD (see Appendix A for membership). The Academic Committee is comprised of a transdisciplinary group of award winning professors who care deeply about graduate teaching and have successfully mentored and trained PhD students. The committee members collaborated in the development of the proposal during a series of monthly meetings held in the 2012/2013 academic year.

# 2 Participating Programs, Degrees and Names of Units

1. Biomedical Engineering (PhD), Institute of Biomaterials and Biomedical Engineering
2. Developmental Psychology and Education (PhD), Department of Applied Psychology and Human Development (OISE)
3. Ecology and Evolutionary Biology (PhD), Department of Ecology and Evolutionary Biology, Faculty of Arts and Science
4. Immunology (PhD), Faculty of Medicine
5. Medical Science (PhD), Institute of Medical Science, Faculty of Medicine
6. Medical Biophysics (PhD), Faculty of Medicine
7. Music (PhD), Faculty of Music
8. Nutritional Sciences (PhD), Department of Nutritional Sciences, Faculty of Medicine
9. Pharmacology (PhD), Department of Pharmacology and Toxicology
10. Physiology (PhD), Department of Physiology, Faculty of Medicine
11. Psychology (PhD), Department of Psychology, Faculty of Arts and Science
12. Public Health Sciences (PhD), Dalla Lana School of Public Health
13. Social Work (PhD), Factor-Inwentash Faculty of Social Work

<u>Supporting Units:</u>
Fraser Mustard Institute for Human Development
Department of Physiology, Faculty of Medicine

# 3 Anticipated Demand, Objectives, Added Value for Students

## 3.1 Anticipated Demand

The anticipated demand for the program is high. The enthusiastic participation of graduate students in FMIHD's recent Connaught Global Challenge International Symposium on Human Development, as authors, presenters of posters and registrants, demonstrates clear interest among University of Toronto students in the area of early human development. More than 25 graduate students from the University of Toronto attended the Symposium, representing the following broad array of disciplines: Cell and Systems Biology; Ecology and Evolutionary Biology; Nursing; Nutritional Sciences; Developmental Psychology and Education; Psychology; and Physiology. Of these students, 16 presented posters. This demonstrates a clearly defined subset of graduate students at the University who are interested in early human development, and currently engaged in original relevant research. It should be noted that the Symposium focused primarily on discovery; the proposed program will attract translational experts as well, drawing on students from departments that were not represented at the symposium, including the Institute of Health Policy, Management and Evaluation, the Dalla Lana School of Public Health, Factor-Inwentash Faculty of Social Work, among others. Based on conversations with core faculty members from these areas who have gauged interest in the proposed Collaborative Program among their current graduate students, we anticipate that once fully established the Program will attract cohorts of 15-20 students each year, resulting in a total enrolment of 60-80 students at any given time. A quick poll of 10 faculty members from the FMIHD Academic Steering Committee revealed a total of 33 PhD students who are ready to apply to the proposed collaborative program.

## 3.2 Added Value

The value that the proposed program will add to students' educational experience falls roughly into three categories: (1) development of transdisciplinary teamwork, communication, and problem solving skills; (2) introduction to a wide range of research programs; and (3) cultivation of translational skills (i.e. the ability to convey scientific information to non-academic audiences)

First, students will receive extensive training in collaborative problem solving and transdisciplinary communication. This training will be provided primarily through the program's core course, the successful completion of which will be required for all students. The course, which will be based on an innovative model of problem-based learning, will require students to work in small groups towards solutions to problems, set in various scenarios, all with a human development theme. Student and faculty participants in these groups will be drawn from across academic disciplines, encouraging students to integrate multiple perspectives in pursuit of a comprehensive solution. We anticipate that the collaborative and communicative skills nurtured in this course will have a powerful influence on students' outlook both within and beyond the academic setting and lead to a greater desire and capacity to participate in future collaborative projects.

The proposed program will also be valuable to students in introducing them to other research programs. This familiarization will be provided by the proposed program not only through the core course, which will bring together students from many fields and is the common learning experience of the program, but also through the rest of the program's shared learning experiences, which will include an annual research day and a seminar series. At these events, students will have the opportunity to understand human development from many perspectives, including those of professors and other students from across the full range of the disciplines involved, ranging from the health sciences to economics and biology. We believe that this extended understanding, coupled with the skills cultivated in the core course, will allow for the future development of ambitious, productive collaborative projects at the interface of multiple disciplines.There will also be opportunities for students registered in the proposed program to interact with students in clinical programs.

The program will also develop valuable skills in translation and knowledge mobilization. The program's core problem-based learning course will frame assignments in terms of translating scientific knowledge surrounding early human development to policy and practice. As a result, graduates from the proposed program will be equipped with strong translational skills as well as comprehensive scientific backgrounds. This unique package of skills is especially valuable given the current scarcity of qualified developmentalists working in agencies concerned with the early stages of human development in Canada. We anticipate that the proposed program will enhance our graduates' collaborative and translational skills so that theywill be qualified and competitive for careers that extend far beyond traditional academia, including positions in non-government organizations, federal research institutes, and non-academic scientific research centres.

Finally, graduates for the program will receive formal recognition of their completion of the collaborative program in human development on their graduate transcripts.

## 3.3 Overlap with other University of Toronto Collaborative Programs

There is currently no collaborative program at the University of Toronto that approaches the scope of the proposed program. Existing programs such as Developmental Biology and Neuroscience encompass certain scientific elements of human development, while programs like Aboriginal Health and Public Health Policy capture the translational aspirations of the program. The proposed Collaborative Program in Human Development can facilitate the integration of the goals of discovery and translation and they will be studied across silos allowing a seamless transition between knowledge and action. Additionally, the problem-based learning model actively promotes the development of transdisciplinary collaborative skills.

# 4 Admission and Program Requirements

## 4.1 Admission Requirements

Applicants must meet the entry requirements of the home graduate program and graduate

unit. The following elements are required by the Collaborative Program in Human Development in addition to the application requirements of the home degree:

- A resume or curriculum vitae
- A 1-2 page short essay explaining the student's interest in the program, and how his/her work is related to human development or areas that intersect with human development
- Two letters of recommendation from faculty members who comment on the student's academic ability, potential as a researcher, and fit within the collaborative program

## 4.2 Program Requirements

The Collaborative Program in Human Development may only be completed at the doctoral level. In addition to meeting the program requirements of the home graduate unit, students will be required to:

- Complete the required core course HDV1000H Pluralistic Human Development (.5 FCE) which will be taught over two terms
- Attend at least 75% of the seminars in the FMIHD seminar seriesin their first year in the program, and 50% of the seminars thereafter for the duration of their PhD program. (SRD4444H, CR/NCR)
- Attend an annual research day, where they must present their work at least once during the duration of their enrolment in the collaborative program.
- Complete a thesis inthe broad area of human development or an area that intersects with human development under the supervision of one of the faculty associated with the collaborative program.

### 4.2.1 Courses

***Core Course***

The proposed Collaborative Program in Human Development will introduce a core course: HDV1000H, Pluralistic Human Development which will be the common learning element of the collaborative program and offered as .5 FCE over two terms. This half-credit course offered on a yearly basis will be taught primarily using a student-driven problem-based learning approach with lectures from distinguished scholars interspersed throughout. Students will work in smallgroups with others from a diverse set of backgrounds and expertise to work collaboratively towards solutions to complex issues surrounding human development. Students from each group will be drawn from at least three different fields. The collaborative group work will be facilitated by core faculty members and post-doctoral fellows, also drawn from several disciplines. As an example of the course's structure, consider the following abridged version of a human development issue that students will be asked to "unpack" and build into a concrete proposal.

*In their Article "How Experience Gets Under the Skin to Create Gradients in Developmental Health" Hertzman and Boyce have proposed the idea that social conditions cause disease. You are given a chance to make your case to the Provincial Government of Ontario as it considers*

*how to allocate funding for the next budget. Can you persuade them to implement the Hertzman-Boyce perspective into health care? What is the vision?*(Hertzman C, Boyce WT (2010) How experience getsunder the skin to create gradients in developmentalhealth. Annu Rev Public Health 31:329–347).

In this case, it is clear that a comprehensive response must integrate viewpoints from many fields. Cell biologists and physiologists might critically assess Boyce and Hertzman's views by examining how biological pathways might be affected by social partitioning; exercise and nutritional scientists might investigate the most effective interventions to mitigate these effects; and health policy and economics students could shed light on the feasibility of various proposed policy reformations in light of budget constraints, existing policy, etc. There are many other perspectives from which this issue might be approached.

The goals of the course are to guide students towards a holistic understanding of early human development, and to foster abilities to work in multidisciplinary teams. The successful achievement of these goals will be reflected in students who develop a basic knowledge of several disciplines, an awareness of where and how they interconnect, and a capacity to work seamlessly across these interfaces during collaborative projects. This will be accomplished by providing a problem-based learning framework in which cross-disciplinary discussion is not only required but also skillfully facilitated by professors and post-doctoral fellows. Students will formally present their responses to the various problems that are posed to them. Course requirements will include a series of presentations as well as an essay, grant proposal and white paper.This half-credit course will run over two terms but will meet for 3 hours on alternate weeks to give students sufficient time to respond adequately to assignments. The students are normally expected to take the core course within the first 3 years of the PhD. The core course will maintain a healthy enrolment each year and the core course anticipated enrolment will be from 10-15 students each year.

***Seminar Series***

The proposed program will offer a type 1 (CR/NCR) SRD 4444H Doctoralseminar series to introduce students to current research in different areas of human development. Speakers will include distinguished international scholars participating in the Fraser Mustard Institute for Human Development Lecture Series, and well as core faculty members from the proposed program. Attendees will include students, faculty, postdocs and guests. The speakers will present their work in an accessible way to accommodate the diverse knowledge bases of attendees. Like the students in the program, speakers will reflect a breadth of expertise; FMIHD's lecture series has already featured researchers from a variety of disciplines, including early childhood education experts and fruit fly geneticists. The goal of the series is to familiarize students with various research programs in human development, and to provide a forum for networking and establishing connections with other like-minded students and researchers. To this end, the program plans to host a lunch after many of the events during which students and researchers can converse and identify opportunities for collaboration. In order to receive a

credit from the seminar series, students will be required to attend 75% of events hosted during their first year in the program, and 50% of events hosted thereafter.

***Annual Research Day***

All students enrolled in the collaborative program must present their work at least once at the Annual Research Day. This activity will not be evaluated. The research day will build cohesion among students in the collaborative program cohorts and expose the students to the research of students and faculty in the research area.

# • CALENDAR ENTRY

**Collaborative Program in Human Development**

***Lead Faculty***
Medicine

***Participating Degree Programs***

1. Biomedical Engineering (PhD), Institute of Biomaterials and Biomedical Engineering
2. Developmental Psychology and Education (PhD), Department of Applied Psychology and Human Development (OISE)
3. Ecology and Evolutionary Biology (PhD), Department of Ecology and Evolutionary Biology, Faculty of Arts and Science
4. Immunology (PhD), Faculty of Medicine
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11. Psychology (PhD), Department of Psychology, Faculty of Arts and Science
12. Public Health Sciences (PhD), Dalla Lana School of Public Health
13. Social Work (PhD), Factor-Inwentash Faculty of Social Work

***Supporting Units***

Fraser Mustard Institute for Human Development (FMIHD)

Department of Physiology, Faculty of Medicine

***Overview***

The Collaborative Program in Human Development (CPHD) is a transdisciplinary program that explores issues surrounding early human development. The healthy development of our children is at the core of our societal values. Recent evidence shows that early experiences strongly influence the biological pathways surrounding health and well being of individuals throughout their lives. This phenomenon involves complex interactions between genes and environments; theCPHD will provide students with the skills and resources necessary to start dissecting and untangling those interrelationships. Keeping in mind the fundamental goal of improving the well being of children, the program will also nurture translational skills in students with the ultimate goal of bridging the gap between basic research and public policy

and practices. In summary, the CPHD aims both to facilitate research on the ways in which early childhood experiences become embedded in our biology, and to foster translational skills in order to disseminate this research most effectively to educators, policy makers, etc. The successful achievement of both of these aims will be supervised by an eminent group of academics with expertise in all relevant areas.

Upon their successful completion of the PhD requirements of the host department and the Collaborative Program, students receive the notation "Completed Collaborative Program in Human Development" on their transcripts.

***Contact and Address***

Web: http://www.oise.utoronto.ca/humandevelopment/index.html
Email: humandevelopment@utoronto.ca
Telephone: 416-978-8325 (Mrs. Victoria de Luca, Administrative Contact)

***Doctoral Degree Level***

*Admission Requirements*

- Acceptance in a participating PhD program
- A resume or curriculum vitae
- A 1-2 page short essay explaining the student's interest in the program, and how his/her work is related to human development or areas that intersect with human development
- Two letters of recommendation from faculty members who comment on the student's academic ability, potential as a researcher, and fit within the collaborative program

*Program Requirements*
In order to complete the Collaborative Program in Human Development, students must:

- Satisfy requirements of home degree program and graduate unit
- Complete the required core course,HDV1000H Pluralistic Human Development (extended .5 FCE over two terms)
- Attend at least 75% of the seminars in the FMIHD seminar series in their first year in the program, and 50% of the seminars thereafter for the duration of their PhD. (SRD4444H, CR/NCR).
- Attend an annual research day, where they must present their work at least once during their registration in the program.
- Complete a thesis inthe broad area of human development or an area that intersects with human development under the supervision of a CP faculty member

**Completion of program requirements:**

All students enrolled in the Collaborative Program must complete the requirements of the Collaborative Program in addition to those requirements for the degree program in their home graduate unit. The Collaborative Program Director and/or Program Committee is/are responsible for certifying the completion of the Collaborative Program requirements. The home graduate unit is solely responsible for the approval of the student's home degree requirements.

# 5 Degree Level Expectations, Program Learning Outcomes and Program Structure

A collaborative program is intended to provide an additional multidisciplinary experience for students enrolled in, and completing the requirements of a degree program. The requirements for the Collaborative Program in Human Development are **in addition to** the degree requirements and are not meant to extend the student's time to degree.

**Table 1: Doctoral DLEs**

| **DOCTORAL DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV)DLEs)** | **DOCTORAL PROGRAM LEARNING OBJECTIVES AND OUTCOMES** | **HOW THE PROGRAM DESIGN AND REQUIREMENT ELEMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES** |
|---|---|---|
| **EXPECTATIONS**<br>***This* Collaborative Program in Human Development *extends the skills associated with the PhD degree and is awarded to students who have demonstrated:*** | | |
| **1. Depth and Breadth of Knowledge**<br>A thorough understanding of a substantial body of knowledge that is at the forefront of their academic discipline or area of professional practice. | Depth of knowledge is defined by the Collaborative Program as a thorough comprehension of at least one aspect of human development. Given the multitude of disciplines participating in the program, students will inevitably acquire their depth of knowledge in different areas; for example, a student from the Department of Cell and Systems Biology might gain an expertise in biological developmental pathways, while a student from the Department of Economics might become proficient in the economic hurdles and benefits to implementing early childhood interventions through government policy. Thus, the depth of knowledge is addressed largely through the primary degree | The program will support the attainment of depth and breadth of knowledge through its common learning elements. In the core course, students from disparate disciplines will engage one another in a student-led problem-based learning environment. This will encourage students both to understand different perspectives on human development and to incorporate them into integrated solutions. The seminar series and the annual day will expose students to a variety of different disciplinary approaches to understanding and ameliorating human development. |

| DOCTORAL DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV)DLEs) | DOCTORAL PROGRAM LEARNING OBJECTIVES AND OUTCOMES | HOW THE PROGRAM DESIGN AND REQUIREMENT ELEMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES |
|---|---|---|
| | program.<br><br>Breadth of knowledge is defined by the Collaborative Program as acquiring the ability to capably and productively interact with those in other disciplines involved in human development. This will be reflected in students who are able to understand the complex holistic nature of inquiry into human development; identify collaborative research opportunities; and effectively engage with other disciplines in an academic setting. | |
| **2. Research and Scholarship**<br><br>a. The ability to conceptualize, design, and implement research for the generation of new knowledge, applications, or understanding at the forefront of the discipline, and to adjust the research design or methodology in the light of unforeseen problems; b.The ability to make informed judgments on complex issues in specialist fields, sometimes requiring new methods; and c. The ability to produce original research, or other advanced scholarship, of a quality to satisfy peer review, and to merit publication. | The specific learning outcomes for students in this area will be in line with the expectations of the primary degree program of registration with a particular focus on human development. | Students will achieve this learning outcome through completing a PhD thesis in the broad area of human development or an area that intersects with human development as part of primarily degree program of registration |
| **3. Level of Application of Knowledge**<br><br>The capacity to i) Undertake pure and/or applied research at an advanced level; and ii) Contribute to the development of academic or professional skills, techniques, tools, practices, ideas, theories, approaches, and/or materials. | Level of application of knowledge is defined by the Collaborative Program as the ability to develop research designs to explore issues related to human development that are situated at the interfaces of academic disciplines.<br><br>This is reflected in students who exhibit at least foundational understanding in many disciplines related to human development and are capable of applying their unique expertise to inventive collaborative | The Collaborative Program will support knowledge application skills through the structure of the core course. The core course will feature problems that require input from multiple perspectives for a satisfactory response. Students will learn to identify how their own academic strengths fit with other areas. |

| DOCTORAL DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV)DLEs) | DOCTORAL PROGRAM LEARNING OBJECTIVES AND OUTCOMES | HOW THE PROGRAM DESIGN AND REQUIREMENT ELEMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES |
|---|---|---|
| | projects. | |
| **4. Professional Capacity/Autonomy**<br><br>a. The qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and largely autonomous initiative in complex situations; b. The intellectual independence to be academically and professionally engaged and current; c. The ethical behavior consistent with academic integrity and the use of appropriate guidelines and procedures for responsible conduct of research; and d. The ability to evaluate the broader implications of applying knowledge to particular contexts. | Professional Capacity/Autonomy is defined by the Collaborative Program as the capacity to work towards certain goals without a clear academic framework or curriculum. Specifically, the Collaborative Program seeks to foster this capacity within a group setting.<br><br>This is reflected in students who demonstrate self-reliance, competence, and strong teamwork skills in pursuing their academic goals. Students who achieve this standard display preparedness for future employment as academics, experts in policy development, or other positions related to human development. | Professional capacity/autonomy is supported by the Collaborative Program through the innovative curriculum on the core course. The majority of the work in the course will be student-led. Students will work independently in their forays into problem-based learning, with the only input from professors being in the form of coaching and/or facilitation of discussions. |
| **5. Level of Communication Skills**<br><br>The ability to communicate complex and/or ambiguous ideas, issues and conclusions clearly and effectively. | Level of Communication Skills is defined by the Collaborative Program as the capability of engaging in stimulating and productive dialogue across disciplinary boundaries. The program aims to cultivate abilities in cross-disciplinary communication such that, for example, biologists and public policy students (and others) can find common ground in discussions of human development<br><br>This is reflected in students who are able to “speak the language” of multiple disciplines; understand what different disciplines mean by “evidence” and “causation,” among other concepts; and convey their own academic concentrations with concision and accuracy. | The Collaborative Program will develop these communicative skills through the core course, the seminar series, and the annual research day. Through all of these common learning experiences, students will be exposed to experts from many disciplines and will have an opportunity to practice discourse skills with many individuals. |
| **6. Awareness of Limits of Knowledge**<br><br>An appreciation of the limitations of one’s own work and discipline, of the complexity of knowledge, and of | Awareness of Limits of Knowledge is addressed through the primary degree program of registration. | N/A |

| DOCTORAL DEGREE LEVEL EXPECTATIONS (based on the Ontario Council of Academic Vice Presidents (OCAV)DLEs) | DOCTORAL PROGRAM LEARNING OBJECTIVES AND OUTCOMES | HOW THE PROGRAM DESIGN AND REQUIREMENT ELEMENTS SUPPORT THE ATTAINMENT OF STUDENT LEARNING OUTCOMES |
|---|---|---|
| the potential contributions of other interpretations, methods, and disciplines.<br><br>Competence in the research process by applying an existing body of knowledge in the critical analysis of a new question or of a specific problem or issue in a new setting. | | |

# 6 Assessment of Learning

Assessment takes place through the formal program requirements. PhD students in the proposed program will complete two courses in human development: a core, problem-based course in which students are formally evaluated on their work and receive a graduate grade, and a continuous seminar series for which students receive a credit for regular attendance. In order to be granted a credit from the seminar series, students will be required to attend 75% of the sessions hosted during their first year in the program, and 50% of sessions thereafter. Each student will also be expected to present their work at the annual research day at least once during their enrolment in the collaborative program. This activity will not be evaluated. By the time a student successfully completes the program, therefore, he/she will have developed a broad base of knowledge that covers a range of issues associated with human development. Attendance will be monitored by the program's core faculty members.

The goals of the core course are to guide students towards a holistic understanding of early human development, and to foster abilities to work in multidisciplinary teams. The successful achievement of these goals will be reflected in students who develop a basic knowledge of several disciplines, an awareness of where and how they interconnect, and a capacity think critically about material from a range of disciplines and to work seamlessly across these interfaces during collaborative projects.Students will be evaluated in three areas: group projects (40%), group presentations (40%), and participation/discussion (20%). Written projects and presentations will be undertaken by small groups composed of students with diverse academic backgrounds. Students will collectively work towards final products that present comprehensive, thoughtful, and integrated responses to difficult problems in human development. The content of the final products will reflect the students' own autonomous work – students will themselves determine the direction of their own projects, with only guidance from faculty.

Participation grades will be awarded at the discretion of the course facilitators, roles that will be assumed by both core faculty members and postdoctoral fellows, and will reflect students' capacity to absorb and evaluate the assigned material and the seminars and to engage in

effective cross-disciplinary communication.

Students will also complete a thesis in the broad area of human development or an area that intersects with human development, which will be assessed in accordance with university policy.

# 7 Resources

The Collaborative Program's core faculty members are available to students in the Program as advisors or supervisors. It is expected that a core faculty member in the student's home department will be involved in thesis supervision. Core faculty members contribute to the Collaborative Program through teaching of the core course and participating in the delivery of seminar series. Not all core faculty members will be active in the Collaborative Program every year and, in many cases, simply may remain available to interested students. Some faculty may teach courses in the subject area of the Collaborative Program in their home program. Students in this Collaborative Program will be encouraged to take relevant courses in other programs, especially where they intersect with the goals of the Collaborative Program. The list of core faculty members is available in Appendix C. Each participating degree program contributes to the Collaborative Program through student enrolments, although not necessarily every year.

This Collaborative Program has a Director and a Program Committee. Together they are responsible for admitting students to the Collaborative Program and ensuring that the faculty associated with the program have the capacity to supervise all program students. Consequently an assessment of supervisory capacity occurs twice: once when students are admitted to their home degree program and once on their application to the Collaborative Program.

The University finds that the participation in a Collaborative program does not normally add significantly to a faculty member's supervisory load. For the most part, students in the collaborative program will continue to have their thesis supervised by a faculty member in their home program who also participates in the Collaborative program.

The Fraser Mustard Institute for Human Development is the primary supportive unit of the collaborative program and it should be noted that the Collaborative Program represents a major educational thrust and key element of the institute's educational mission and mandate. The Fraser Mustard Institute for Human Development is committed to indefinitely supporting the Collaborative Program financially and will provide funds to support speakers and the events of the graduate seminar series, the annual research day, funding to pay for administrative support, funds for advertising and a stipend for the director. The Department of Physiology is the supporting graduate unit at the University of Toronto and it will provide administrative support, including entering grades and course enrolment on ROSI, and provide space for delivery of the program's core course, seminars, and for committee meetings on a fee for service basis. The fee will be covered by the FMIHD. The program will be housed in the Faculty of Medicine and will share space and an administrator with other collaborative programs that

the Department of Physiology houses. The fee for the administrative support will be covered annually by the Fraser Mustard Institute for Human Development. The sharing of physical space with other collaborative programs will allow for the interactions of these communities of learners. Each participating department will pay $1,000 per year to be part of the Collaborative Program in Human Development and help sustain the seminar series by bringing in guest speakers.

Please see Appendix C for a list by program of core graduate faculty.

# 8 Administration

Please see Appendix D: Memorandum of Agreement

# 9 Governance Process

| | **Levels of Approval Required** |
|---|---|
| **Consultation with Provost** | |
| **Decanal and Provostial Sign Off** | |
| | Graduate unit approval |
| | Faculty/Divisional Governance |
| **Submission to Provost's Office** | AP&P |
| **Program may begin advertising as "Pending Approval"** | |
| | Ontario Quality Council |

# Appendix A: Fraser Mustard Institute for Human Development Academic Steering Committee

## EDUCATE THEME

**Lead:** Dr. Marla Sokolowski

**Academic Committee membership includes:**

- Dr. Marla Sokolowski, (Academic Director, Fraser Mustard Institute for Human Development, Department of Ecology and Evolutionary Biology, Arts and Science, Committee Chair)
- Dr. Michael Baker, (Department of Economics, Acting Director of the School for Public Policy and Governance)
- Dr. Diego Bassani, (Paediatrics, Epidemiology and Dalla Lana School of Public Health; Sickkids Hospital)
- Ms. Jane Bertrand (Margaret and Wallace McCain Family Foundation)
- Dr. Steffen-Sebastian Boltz, (Department of Physiology, Medicine)
- Dr. Carl Corter, (Dr. Eric Jackman Institute of Child Study, OISE)
- Dr. Chi Chung (C.C.) Hui, (Department of Molecular Genetics)
- Dr. Barbara Fallon, (Faculty of Social Work; Director, Canadian Incidence Study of Reported Child Abuse and Neglect)
- Dr. Alison Fleming, (Department of Psychology, UTM)
- Dr. David Haley, (Department of Psychology, UTSc)
- Dr. Kang Lee, (Dr. Eric Jackman Institute of Child Study and Applied Psychology and Development, OISE)
- Dr. Joel Levine, (Department of Biology, UTM)
- Dr. Robert Levitan, (Department of Psychiatry; CAMH)
- Dr. Michal Perlman, (Department of Applied Psychology and Development, OISE)
- Dr. Helen Rodd, (Depatment of Ecology and Evolutionary Biology, Arts and Science)
- Dr. Albert Wong, (Department of Pharmacology& Toxicology, Department of Psychiatry, CAMH).

# Appendix B: Collaborative Program Requirements & Degree Program Requirements

**Participating Degree Programs**

1. Biomedical Engineering (PhD), Institute of Biomaterials and Biomedical Engineering
2. Developmental Psychology and Education (PhD), Department of Applied Psychology and Human Development (OISE)
3. Ecology and Evolutionary Biology (PhD), Department of Ecology and Evolutionary Biology, Faculty of Arts and Science
4. Immunology (PhD), Faculty of Medicine
5. Medical Science (PhD), Institute of Medical Science, Faculty of Medicine
6. Medical Biophysics (PhD), Faculty of Medicine
7. Music (PhD), Faculty of Music
8. Nutritional Sciences (PhD), Department of Nutritional Sciences, Faculty of Medicine
9. Pharmacology (PhD), Department of Pharmacology and Toxicology
10. Physiology (PhD), Department of Physiology, Faculty of Medicine
11. Psychology (PhD), Department of Psychology, Faculty of Arts and Science
12. Public Health Sciences (PhD), Dalla Lana School of Public Health
13. Social Work (PhD), Factor-Inwentash Faculty of Social Work

Fraser Mustard Institute (Supporting Unit)
Department of Physiology, Faculty of Medicine (Supporting Unit)

**In all cases the Seminar Series will be in addition to the home degree program requirements. The PhD thesis will be in the topic area of the Collaborative Program.**

**There is sufficient elective room in each program for the core half course to be counted as an elective.**

***Department of Applied Psychology and Human Development***
***PhD in Developmental Psychology and Education***
PhD Requirements: 1.0 FCEs required courses
1.0 FCEs from within degree program
1.0 FCEs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Department of Ecology and Evolutionary Biology***
***PhD in Ecology and Evolutionary Biology***
PhD Requirements: 0.5 FCEs required courses
1.5 FCEs elective courses

The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Department of Immunology, Faculty of Medicine***
***PhD in Immunology***
PhD Requirements: 2.0 FCEs required courses
0.5 FCEs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Institute of Biomaterials and Biomedical Engineering***
***PhD in Biomedical Engineering***
PhD Requirements: 1.0 FCEs required course (when entering with a masters degree; variations depend on background.
0.5 FECs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program depending on student's background– no additional courses are required.

***Institute of Medical Science***
***PhD in Medical Science***
PhD Requirements: 1.0 FCEs required course
0.5-1.0 FECs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Department of Medical Biophysics***
***PhD in Medical Biophysics***
PhD Requirements: 4.5 FCEs required course (variations depend on streams)
Up to 0.5-1.0 FECs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

**Faculty of Music**
**PhD in Music**
PhD Requirements: 1.0 FCEs required course
5.0 FECs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Faculty Department of Nutritional Sciences***
***PhD in Nutritional Sciences***
PhD Requirements: 2.0-3.0 FCEs elective courses (depending on whether student enters from undergraduate or Master's program)

The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Department of Physiology***
***PhD in Physiology***
PhD Requirements: 1.0 FCEs required courses
0.5 FCEs from within degree program
1.0 FCEs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Department of Psychology***
***PhD in Psychology***
PhD Requirements: 2.0 FCEs required courses
0.5 FCEs course in statistics

1.0 FCEs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Dalla Lana School of Public Health***
***PhD in Public Health Sciences (Epidemiology field of study)***
PhD Requirements: 3.0 FCEs required courses
1.0 FCEs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***Dalla Lana School of Public Health***
***PhD in Public Health Sciences (Social and Behavioural Health Sciences field of study)***
PhD Requirements: 2.5 FCEs required courses
1.0 FCEs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

***The Factor-Inwentash Faculty of Social Work***
***PhD in Social Work***
PhD Requirements: 2.5 FCEs required courses
2.5 FCEs elective courses
The Collaborative program's required core course may be counted as 0.5 FCE within the elective space of the PhD program– no additional courses are required.

# Appendix C: Core Faculty Research Synopses

All core faculty in a Collaborative Program are Graduate Faculty members approved to teach in their home unit and also approved by the home unit chair/director for cross-appointment to the Collaborative Program. This list demonstrates that the core faculty are active in the Collaborative Program area of human development by highlighting their peer-reviewed publications.

**Department of Applied Psychology and Human Development**

**Patricia Ganea**

**Ganea, P.A**. Harris, P. H. (2013). Early limits on the verbal updating of an object's location.*Journal of Experimental Child Psychology, 114,* 89-101

**Ganea, P. A.** Saylor M. M. (2013). Talking about the near and the dear; Infants' comprehension of displaced speech. *Developmental Psychology, 49,* 1299-1307

**Jennifer Jenkins**

Browne DT, **Jenkins JM**. Health across early childhood and socioeconomic status: examining the moderating effects of differential parenting. Social Science and Medicine, 2012 74(10): 1622-9

Browne DT, Meunier JC, O'Connor TG, **Jenkins JM**. The role of parental personality traits in differential parenting. Journal of Family Psychology, 2012 26(4): 542-53

**Kang Lee**

Talwar V, **Lee K**. Social and cognitive correlates of children's lying behavior. *Child Development*, 2008 79(4): 866-81

Talwar V, **Lee K**. A punitive environment fosters children's dishonesty: a natural experiment. *Child Development*, 2012 82(6): 1751-8

**Janette Pelletier**

Corter, C. &**Pelletier, J**. Schools as integrated service hubs for young children and families: Policy implications of the Toronto First Duty Project. *International Journal of Child Care and Education Policy*, 2010 4(2): 1-17.

Harper, S. &**Pelletier, J**. Parent involvement in early childhood: a comparison of English language learners and English first language families. *International Journal of Early Years Education*, 2010 18(2): 123-141.

**Michal Perlman**

Zellman, G &**Perlman, M**. Reconceptualizng the role of parents' involvement in their children's child care providers. *Early Child Development and Care*, 2006 176(5): 521-538.

Le, V., **Perlman, M**., Zellman, G. & Hamilton, L. Measuring Child-Staff Ratios in Child Care Centers: Balancing Effort and Representatives. *Early Childhood Research Quarterly*, 2006 21(3): 267-279.

**Suzanne Stewart**

**Stewart, S**. Indigenous research methods and healing. *International Journal of Health Promotion and Education*, 2011 12(4): 15-28.

**Stewart, S**. Indigenous family therapy: constructivist perspectives. *First Peoples Child & Family Review*, 2009 4(2): 99-118.

**Department of Ecology and Evolutionary Biology**

**Joel Levine**

Billeter JC, Jagadeesh S, Azanchi R, **Levine JD**. Drosophila melanogaster females change mating behaviour and offspring production based on social context. *Proceedings of the Royal Society B. Biological Science*, 2012 279(1737): 2417-2425

Krupp JJ, Kent C, Billeter JC, Azanchi R, So AK, Schonfeld JA, Smith BP, Lucas C, **Levine JD**. Social experience modifies pheromone expression and mating behavior in male Drosophila melanogaster. *Current Biology*, 2008 18(18): 1373-83

**Helen Rodd**

Leips, J., Richardson, J.M.L.R., **Rodd, F.H**. and J. Travis. Adaptive maternal adjustments of offspring size in response to conspecific density in two populations of the least killifish, *Heterandria formosa*. *Evolution* 2009 63(5):1341-1347

Song, Z., M.C. Boenke, and **F.H. Rodd**. 2011. Interpopulation differences in shoaling behaviour in guppies (*Poecilia reticulata*): roles of social environment and population origin. Ethology 117: 1009-1018. DOI: 10.1111/j.1439-0310.2011.01952.x

**LockeRowe**

Long TA, Agrawal AF, **Rowe L**. The effect of sexual selection on offspring fitness depends on the nature of genetic variation. *Current Biology*, 2012 22(3): 204-8

Dmitriew C, **Rowe L.** The effects of larval nutrition on reproductive performance in a food-limited adult environment. *PLoS One*, 2011 6(3):e17399

**Marla Sokolowski**

Burns JG, Svetec N, Rowe L, Mery F, Dolan MJ, Boyce WT, **Sokolowski MB**. Gene-environment interplay in *Drosophila melanogaster*: chronic food deprivation in early life affects adult

exploratory and fitness traits. *Proceedings in the National Academy of Science*, 2012 17239-44

Mileva-Seitz V, Fleming AS, Meaney MJ, Mastroianni A, Sinnwell JP, Steiner M, Atkinson L, Levitan RD, Matthews SG, Kennedy JL, **Sokolowski MB**. Dopamine receptors D1 and D2 are related to observed maternal behavior. *Genes, Brain and Behaviour*, 2012 11(6) 684-94

**Department of Immunology**

**Juan Carlos Zuniga-Pflucker**

Sasaki M, Knobbe CB, Munger JC, Lind EF, Brenner D, Brüstle A, Harris IS, Holmes R, Wakeham A, Haight J, You-Ten A, Li WY, Schalm S, Su SM, Virtanen C, Reifenberger G, Ohashi PS, Barber DL, Figueroa ME, Melnick A, **Zúñiga-Pflücker JC**, Mak TW. IDH1(R132H) mutation increases murine haematopoietic progenitors and alters epigenetics. Nature. 2012 Aug 30;488(7413):656-9. doi: 10.1038/nature11323.

Awong G**, Zúñiga-Pflücker JC.** Generation, isolation, and engraftment of in vitro-derived human T cell progentiors. Methods Mol Biol. 2013;946:103-13. doi: 10.1007/978-1-62703-128-8_7.

**Department of Medical Biophysics**

**Derek van der Kooy**

Balenci, L., **van der Kooy, D.** Notch signaling induces retinal stem-like properties in perinatal neural retina progenitors and promotes symmetrical divisions in adult retinal stem cells. Stem Cells and Development Stem Cells and Devlopment. 20 (2013) Ahead of Print.

Balenci L, Wonders C, L Kcoles-Takabe B, Clarke L, **van der Kooy D**. Bmps and Sfrp2 Maintain the Quiescence of Adult Mammalian Retinal Stem Cells. Stem Cells. 31(10) (2013) 2218-30

**Institute of Biomaterials and Biomedical Engineering**

**Tom Chau**

Schudlo LC, **Chau T.**Dynamic topgraphical pattern classification of multichannel prefrontal NIRS siganals: II online differentiation of mental arithmetic and rest J Neural Eng. 2014 Feb;11(1):016003. doi: 10.1088/1741-2560/11/1/016003.

Memarian N, Blain-Moraes S, **Chau T.** Towards a physiological signal-based access solution for a non-verbal adolescent with severe multiple disabilities. Dev Neurorehabil. 2013 [Epub ahead of print]

**Instituite of Medical Science**

**Steve Miller**

Chau V, Brant R, Poskitt KJ, Tam EW, Synnes A, **Miller SP**. Postnatal Infection is Associated with Widespread Abnormalities of Brain Development in Premature Newborns.***Pediatric*** *Research* 2012; 71(3):274-9

**Miller SP**, Ferriero DM. From Selective Vulnerability To Connectivity: Insights From Newborn Brain Imaging**.***Trends Neuroscience*. 2009; 32(9):496-505

**Denis Daneman**

Denburg A. and **Daneman D.** the link between social inequality and child health outcomes. *Healtc Q.* 2010, 1:21-31

Colton, PA, Olmsted MP, **Daneman D**. Rodin GM. Depression, disturbed eating behaviour, and metabolic control in teenage girls with type 1 diabetes. *Pediatric Diabetes*. 2013, 5:372-6.

**Robert Levitan**

Silveira PP, Portella AK, Kennedy JL, Gaudreau H, Davis C, Steiner M, Soares CN, Matthews SG, Sokolowski MB, Dubé L, Loucks EB, Hamilton J, Meaney MJ, **Levitan RD**; MAVAN Study Team. Association between the seven-repeat allele of the dopamine-4 receptor gene (DRD$) spontaneous food intake in pre-school children. *Appetite.* 2014 Feb;73:15-22. doi: 10.1016/j.appet.2013.10.004. Epub 2013 Oct 20.

Atkinson L, Gonzalez A, Kashy DA, Santo Basile V, Masellis M, Pereira J, Chisholm V, **Levitan R.** Maternal sensitivity and infant and mother adrenocortical function across challenges. Psychoneuroendocrinology. 2013 Dec;38(12):2943-51. doi: 10.1016/j.psyneuen.2013.08.001. Epub 2013 Aug 16.

**Faculty of Music**

**Lee Bartel**

**Bartel, L.**(2006). Trends in Data Acquisition and Knowledge Development.In Colwell, R. (Ed). MENC Handbook of Research Methodologies. Oxford University Press.

**Bartel, L.** (2004). What is the Music Education Paradigm? In Bartel, L. (Ed). Questioning the Music Education Paradigm. Volume II of the Series "Research to Practice: A Biennial Series." Toronto: Canadian Music Educators Association.

**Bina John**

**John, B.** (2006). Affect and Music, In Bartel, L. (Ed). Questioning the Music Education Paradigm. Volume II of the Series "Research to Practice: A Biennial Series." Toronto: Canadian Music Educators Association.

**John, B.** (2006). The Healing Ritual of Choral Singing: Planting Seeds of Compassion. Toronto: *Music Time.*

**Department of Nutritional Sciences**

**Jill Hamilton**

Luca P., Birken C, Grewal P, Dettmer E., **Hamilton J**. Complex Obesity. *Current Pediatric Reviews.* 2012 Vol 8 (2): p179-187

Retnakaran R. Ye C., Hanley AJ, Connelly PW, Sermer M, Zinman B, **Hamilton J**. Effect of maternal weight, adipokines, glucose intolerance and lipids on infant birthweight in women without gestational diabetes mellitus. *CMAJ.* 2012 May 22.

**Mary L'abbe**

Emrich TE, Cohen JE, Lou WY, **L'abbé MR**. Food products qualifying for and carrying front-of-pack symbols: a cross-sectional study examining a manufacturer led and a non-profit led program.*BMC Public Health.* 2013 Sep 13;13:846. doi: 10.1186/1471-2458-13-846.

**L'abbé MR**, Dumais L, Chao E, Junkins B. Health claims on foods in Canada. *J Nutr*. 2008 Jun;138(6):1221S-7S.

**Harvey Anderson**

Reza López SA, Poon AN, Szeto IM, Ma DW, **Anderson GH**. High multivitamin intakes during pregnancy and postweaning obesogenic diets interact to affect the relationship between expression of PPAR genes and glucose retulation in the offspring. J Nutr Biochem.2013 May;24(5):877-81. doi: 10.1016/j.jnutbio.2012.06.001. Epub 2012 Aug 20.

Cho CE, Sánchez-Hernández D, Reza-López SA, Huot PS, Kim YI, **Anderson GH**. High folate gestational and post-weaning diets alter hypothalamic feeding pathways by DNA methylation in Wistar rat offspring. *Epigenetics*. 2013 Jul;8(7):710-9. doi: 10.4161/epi.24948. Epub 2013 May 14.

**Department of Pharmacology and Toxicology**

**Albert Wong**

Zawadzki JA, Girard TA, Foussias G, Rodrigues A, Siddiqui I, Lerch JP, Grady C, Remington G, **Wong AH**: Simulating real world functioning in schizophrenia using a naturalistic city environment and single-trial, goal-directed navigation. *Frontiers in Behavioral Neuroscience.* 2013; 7:180. doi: 10.3389/fnbeh.2013.00180

Lipina TV, Zai C, Hlousek D, Roder JC, **Wong AHC:** Maternal immune activation during gestation interacts with *Disc1* point mutation to exacerbate schizophrenia-related behaviours in mice. *The Journal of Neuroscience;* May 1, 2013: 33(18):7654 –7666

**Department of Physiology**

**Alan Bocking**

Sozo F, Vela M, Stokes V, Kenna K, Meikle PJ, De Matteo R, Walker D, Brien J, **Bocking A**, Harding R. Effects of prenatal ethanol exposure on the lungs of postnatal lambs. *American Journal of Physiology: Lung Cellular and Molecular Physiology,* 2011 300(1):L139-47

Zelner I, Kenna K, Brien JF, **Bocking A**, Harding R, Walker D, Koren G. Meconium fatty acid ethyl esters as biomarkers of late gestational ethanol exposure and indicator of ethanol-induced multi-organ injury in fetal sheep. *PLoS One*, 2013 8(3):e59168

**Evelyn Lambe**

**E.K. Lambe,** S.G. Fillman, M.J. Webster, C.S. Weickert (2011) Serotonin receptor expression in human prefrontal cortex: Balancing excitation and inhibition across postnatal development. *PLoS One* 6: (e22799) 1-10.

G.M. Pitcher, L.V. Kalia, D. Ng, N.M. Goodfellow, K.T. Yee, **E.K. Lambe,** M.W. Salter (2011) Schizophrenia susceptibility pathway neuregulin1-ErbB4 suppresses the Src kinase upregulation of NMDA receptors in the induction of lasting synaptic potentiation. *Nature Medicine* 17: 470-8.

**Stephen Lye**

Warrington NM, Wu YY, Pennell CE, Marsh JA, Beilin LJ, Palmer LJ, **Lye SJ**, Briollais L. Modelling BMI trajectories in children for genetic association studies. *PLoS One,* 2013 8(1):e53897

Knight BS, Sunn N, Pennell CE, Adamson SL, **Lye SJ**. Developmental regulation of cardiovascular function is dependent on both genotype and environment. *American Journal of Physiology: Heart and Circulatory Physiology*, 2009 297(6):H2234-41

**Stephen Matthews**

Lye P, Bloise E, Dunk C, Javam M, Gibb W, Lye SJ, **Matthews SG**. Effect of Oxygen on multidrug resistance in the first trimester human placenta. *Placenta*, 2013 (in press)

Bloise E, Bhuiyan M, Audette MC, Petropoulos S, Javam M, Gibb W, **Matthews SG**. Prenatal endotoxemia and placental drug transport in the mouse: placental size-specific effects. *PLoS One*, 2013 8(6):e65728

**Department of Psychology**

**Alison Fleming**

Gonzalez A, Jenkins JM, Steiner M, **Fleming AS**. Maternal early life experiences and parenting: the mediating role of cortisol and executive function. *Journal of the American Academy of Child and Adolescent Psychiatry*, 2012 51(7): 673-82

Gonzalez A, Jenkins JM, Steiner M, **Fleming AS**. The relation between early life adversity, cortisol awakening response and diurnal salivary cortisol levels in postpartum women. *Psychoneuroendocrinology*, 2009 34(1): 76-86

**David Haley**

**Haley, D**. **W**., Grunau, R. E., Oberlander, T. F., & Weinberg, J.. Contingency learning and reactivity in preterm and full-term infants at 3 months. *Infancy*, 2008 13(6), 570-595.

Grunau, R. E., **Haley, D**. **W**., Whitfield, M. F., Weinberg, J., Yu, W., & Thiessen, P. Altered basal cortisol levels at 3, 6, 8 and 18 months in preterm infants born extremely low gestational age. *J. Pediatrics*, 2007 150, 151-6.

**Tina Malti**

**Malti, T**., Averdijk, M., Ribeaud, D., Rotenberg, K., & Eisner, M.P. "Do you trust him?" Children's trust beliefs and developmental trajectories of aggressive behavior in an ethnically diverse sample. *Journal of Abnormal Child Psychology*, 2013 41(3), 445-456.

**Malti, T**., Gummerum, M., Keller, M., Chaparro, M.P., & Buchmann, M. Early sympathy and social acceptance predict the development of sharing in children. *PLoS One*, 2012 7(12), e52017

**<u>Public Health Sciences, Dalla Lana School of Public Health</u>**

**Anna Banerji**

**Banerji A,** Panzov V, Robinson J, Young M, Ng K, Mamdani M. The cost of lower respiratory tract infections hospital admissionsin the Canadian Arctic. *Int J Circumpolar Health*. 2013 Aug 5;72. doi: 10.3402/ijch.v72i0.21595. eCollection 2013.

**Banerji A;** Canadian Paediatric Society, First Nations, Inuit and Métis Health Committee. Preventing unintentional injuries in Indigenous children and youth in Canada. *Paediatr Child Health.* 2012 Aug;17(7):393-4.

**Diego Bassani**

Million Death Study Collaborators, **Bassani DG**, Kumar R, Awasthi S, Morris SK, Paul VK, Shet A, Ram U, Gaffey MF, Black RE, Jha P. Causes of neonatal and child mortality in India: a nationally representative mortality survey. *Lancet* 2010 376(9755):1853-60.

**Bassani DG,** Jha P, Dhingra N, Kumar R. Child mortality from solid-fuel use in India: a nationally-representative case-control study. *BMC Public Health*, 2010 10:491

**Howard Hu**

Peters JL, Kubzansky LD, Ikeda A, Spiro A 3rd, Wright RO, Weisskopf MG, Kim D, Sparrow D, Nie LH, **Hu H**, Schwartz J. Childhood and adult socioeconomic position, cumulative lead levels, and pessimism in later life: the VA Normative Aging Study. *American Journal of Epidemiology*, 2004 174(12):1345-53

Peters JL, Kubzansky LD, Ikeda A, Fang SC, Sparrow D, Weisskopf MG, Wright RO, Vokonas P, **Hu H**, Schwartz J.Lead concentrations in relation to multiple biomarkers of cardiovascular disease: the Normative Aging Study. *Environmental Health Perspectives*, 2012 120(3): 361-6

**Arjumand Siddiqi**

**Siddiqi A**, Kawachi I, Berkman LF, Hertzman C and Subramanian SV. 2012. Education determines a nation's health, but what determines educational outcomes? A cross-national comparative analysis. *Journal of Public Health Policy,* 2012 33: 1-15.

Hertzman C, **Siddiqi A**, Hertzman E, Irwin LG, Vaghri Z, Houweling TAJ, Bell R, Tinajero A, Marmot M. Bucking the Gradient: Tackling Inequalities through Early Child Development. *British Medical Journal*, 2010 340:c468.

**Janet Symlie**

Smylie J., Lofters A., Firestone M., O'Campo P. Population Based Data and Community Empowerment. In: Rethinking Social Epidemiology: Towards a Science of Change. O'Campo P, Dunn J (Eds.). New York: Springer, 2011

Smylie, J. Knowledge Translation and Indigenous Knowledge- A Decolonizing Perspective. In: Knowledge Translation in Community-Based Research and Social Policy Contexts. Banister, E. M., Leadbeater, B. J., & Marshall, A. (Eds.). Toronto: University of Toronto Press, 2011

**<u>Factor-Inwentash Faculty of Social Work</u>**

**Barbara Fallon**

**Fallon B**, Trocmé N, MacLaurin B. Should child protection services respond differently to maltreatment, risk of maltreatment, and risk of harm?. *Child Abuse and Neglect*, 2011 35(4): 236-9

**Fallon B**, Ma J, Allan K, Pillhofer M, Trocmé N, Jud A. Opportunities for prevention and intervention with young children: lessons from the Canadian incidence study of reported child abuse and neglect. *Child and Adolescent Psychiatry and Mental Health*, 2013 7(1):4

**Faye Mishna**

**Mishna, F.**, Cook, C., Saini, M., Wu, M-J., & MacFadden, R. (2010). Interventions to prevent and reduce cyber abuse of youth: A systematic review. *Research in Social Work Practice*, DOI: 10.1177/1049731509351988. (print version in press).

**Mishna, F.**, Muskat, B., & Wiener, J. (2010). 'I'm not lazy, it's just that I learn differently': Development and implementation of a manualized school-based group for students with LD. *Social Work with Groups*, , 33 (2), 139-159.

# Appendix D: Memorandum of Agreement

**University of Toronto**

**MEMORANDUM OF AGREEMENT**

**Collaborative Doctoral Program in Human Development**

January, 2014

Memorandum of Agreement concerning a Collaborative Graduate Program in Human Development

## 1.Brief Description

In order to develop cooperative and multidisciplinary graduate education and research in Human Development, the following graduate units agree to the participation of graduate programs and associated degrees in the collaborative program:

1. Biomedical Engineering (PhD), Institute of Biomaterials and Biomedical Engineering
2. Developmental Psychology and Education (PhD), Department of Applied Psychology and Human Development (OISE)
3. Ecology and Evolutionary Biology (PhD), Department of Ecology and Evolutionary Biology, Faculty of Arts and Science
4. Immunology (PhD), Faculty of Medicine
5. Medical Science (PhD), Institute of Medical Science, Faculty of Medicine
6. Medical Biophysics (PhD), Faculty of Medicine
7. Music (PhD), Faculty of Music
8. Nutritional Sciences (PhD), Department of Nutritional Sciences, Faculty of Medicine
9. Pharmacology (PhD), Department of Pharmacology and Toxicology
10. Physiology (PhD), Department of Physiology, Faculty of Medicine
11. Psychology (PhD), Department of Psychology, Faculty of Arts and Science
12. Public Health Sciences (PhD), Dalla Lana School of Public Health
13. Social Work (PhD), Factor-Inwentash Faculty of Social Work

## 2.Admission and Program Requirements and Completion

### 2.1Admission Requirements

Applicants must be accepted into a graduate degree program before being accepted into a collaborative program, and must meet the admission requirements of both the home graduate unit and the collaborative program. The following are the admissions requirements for the collaborative program:

- Acceptance in a participating PhD program

- A resume or curriculum vitae
- A 1-2 page short essay explaining the student's interest in the program, and how his/her work is related to human development or areas that intersect with human development
- Two letters of recommendation from faculty members who comment on the student's academic ability, potential as a researcher, and fit within the collaborative program

### 2.2 Program Requirements

The student must register first in the home graduate unit/program. Thereafter, upon acceptance to the collaborative program, the student will register in the collaborative program. The student must meet all degree requirements of the participating graduate unit/program, as well as the requirements of the Collaborative Program.

In order to complete the Collaborative Program in Human Development, students must:

- Satisfy requirements of home degree program and graduate unit
- Complete the required core courseHDV1000H Pluralistic Human Development(0.5 FCEs over two terms)
- Attend at least 75% of the seminars in the FMIHD seminar series during their first year in the program, and at least 50% of seminars hosted thereafter for the remainder of their PhD program (SRD 4444H, CR/NCR)
- Attend an annual research day, where they must present their work at least once
- Complete a thesis inthe broad area of human development or an area that intersects with human development

### 2.3 Program Completion

Upon certification by the collaborative program director that all requirements of the collaborative program have been fulfilled, the designation "Completed the Collaborative Doctoral Program in Human Development" is shown on the graduate transcript. The home graduate unit recommends the granting of the degree.

## 3.Role of Participating Graduate Units

Each participating graduate unit shall retain its constitutional control over admissions and home program requirements, and is responsible to provide adequate research supervision by a member of the graduate faculty in the unit. Students in the Collaborative Program normally are supervised by a member of the collaborative program's core faculty, or have a core faculty member as a member of the supervisory committee (where supervision and a supervisory committee are required). Participating graduate units include reference to the Collaborative Program in the SGS Calendar entry, on the graduate unit website, and in other advertising material related to the home program. Core faculty members are identified with the Collaborative Program via the director's office. Core faculty members remain available to contribute to the collaborative program through teaching, supervision and participation in the

delivery of seminar series and other collaborative program learning elements, and may serve on the Collaborative Program committee. Not all faculty members necessarily participate each year and, in many cases, may simply remain available to interested students. Some faculty may teach courses in the subject area of the collaborative program in the home program.

## 4. Administration of the Program

### 4.1Program Director

The Program Committee initiates and recommends the appointment of a new director to the Dean of SGS, after consultation with chairs/directors of participating graduate units and with the collaborative program director. The Dean of the School of Graduate Studies approves appointments of directors of collaborative programs for terms normally up to five years (renewable).

### 4.2 Program Committee

The Collaborative Program is administered by a Program Committee consisting of at least one core graduate faculty member from each participating home program. The Program Committee shall be chaired by the Program Director. The Committee shall meet at least once annually. The Committee shall be responsible for the following activities:

- Review of all applications and admissions to the Collaborative Program
- Nomination of a Director from among its membership, as required
- Other issues (e.g. student counseling, curriculum review, approving advertising, adjudication of student funding and awards)

### 4.3 Administration: General

The program director will be assisted by the Collaborative Program Committeeand a part-time staff administrative assistant paid by the Fraser Mustard Institute for Human Development.

## 5 Supporting Units

The Fraser Mustard Institute for Human Development is the primary supportive unit of the collaborative program and it should be noted that the Collaborative Program represents a major educational thrust and key element of the institute's educational mission and mandate. The Fraser Mustard Institute for Human Development is committed to indefinitely supporting the Collaborative Program financially and will provide funds to support speakers and the events of the graduate seminar series, the annual day, funding to pay for administrative support, funds for advertising and a stipend for the director. The Department of Physiology is the supporting graduate unit at the University of Toronto and it will provide administrative support, including entering grades and course enrolment on ROSI, on a fee for service basis. The Department of Physiology will also provide space for delivery of the program's core course, seminars, and for

committee meetings. The program will be housed in the Faculty of Medicine and will share space and an administrator with other collaborative programs that the Department of Physiology houses. The fee for the administrative support will be covered annually by the Fraser Mustard Institute for Human Development. The sharing of physical space with other collaborative programs will allow for the interactions of these communities of learners.

## 6 Resource Issues

The Collaborative Program will be fully resourced by the Fraser Mustard Institute for Human Development and the FMIHD is committed to financially supporting the Collaborative Program indefinitely. Funds provided by the FMIHD will go towards delivering the curriculum, administrative costs such a portion of an administrator's time and office space, communications, advertising and the website, as well as to support speakers and the events of the graduate seminar series and the annual research day.

The participating graduate units will be required to help sustain the seminar series by bringing in guest speakers, and will contribute $1000 annually to the collaborative program. The funds will be used to supplement the items listed above. The Director and Program Committee may reassess the annual amount graduate units provide in the future.

# University of Toronto
# MEMORANDUM OF AGREEMENT (cont'd):

# SIGNATURE PAGE

## Collaborative Ph.D. Program in Human Development

## January, 2014

**UNIT AGREES TO PARTICIPATE IN ACCORDANCE WITH ALL TERMS OUTLINED IN THIS MEMORANDUM OF AGREEMENT**

**Collaborative Program Director**:

_____ Date: _____

*Director's Name*

**Graduate Units Participating in Collaborative Program:**

_____ Date: _____

*Chair/Director, Graduate Unit*

_____ Date: _____

*Chair/Director, Graduate Unit*

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*Chair/Director, Graduate Unit*

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*Chair/Director, Graduate Unit*

**Supporting Unit***:*

_____ Date: _____

*Chair/Director, Unit Name*

_____ Date: _____

*Chair/Director, Unit Name*

## ***Lead Faculty:Medicine***

_____ Date: _____

*Avrum Gotlieb, Interim Vice-Dean, Graduate and Life Science Education*

## **School of Graduate Studies & Vice-Provost, Graduate Education:**

_____ Date: _____

*Brian Corman,*

*Dean, School of Graduate Studies and Vice-Provost, Graduate Education*