### Faculty of Medicine Annual Grant Writing Workshop
Hosted by the Office of the Vice Dean, Research & Innovation

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<th>Time</th>
<th>Session</th>
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<tr>
<td>9:10am</td>
<td>Overview of Services, Office of the Vice Dean, Research &amp; Innovation</td>
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<td>9:15am</td>
<td>A Reviewer’s Perspective on Grant Review Panels and Funding Success</td>
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<td>Professor Brenda Andrews, Director, Donnelly Centre</td>
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<tr>
<td>10:15am-10:40am</td>
<td>Refreshment Break—25 Minutes</td>
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<td><em>(Food and Drink are not permitted in the lecture hall.)</em></td>
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<tr>
<td>10:40am-11:00pm</td>
<td>Core Facilities and Services in the Faculty of Medicine</td>
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<td>Natasha Christie-Holmes, PhD, Research Operations Officer,</td>
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<td>Faculty of Medicine</td>
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<td>11:00-12:00pm</td>
<td>Grant Fundamentals and Tips to Improve Your Research Proposals</td>
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<td>Daniel Harney, PhD, Grants &amp; Awards Editor, Faculty of Medicine</td>
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Office of the Vice Dean, Research & Innovation

Dr. Richard Hegele, Vice Dean, Research & Innovation

• **Researcher Support & Authorization**
  • Authorizes funding applications, coordinates internal allocations & competitions (CRC, CFI), disseminates funding opportunities (“What’s New?” e-newsletter)

• **Grant Application Facilitation & Development**
  • Proposal editing, budgetary reviews, and awards & honours nominations

• **Core Facilities & Services**
  • Oversees and manages the CSS, CL3, DCM, and MIL facilities

• **Research Metrics**
  • Provides research funding and bibliometric data to stakeholders and external partners

• **Health Innovation Hub (H2I)**
  • Educates and facilitates trainee-initiated commercialization of health matters
GRANT FUNDAMENTALS AND TIPS TO IMPROVE YOUR RESEARCH PROPOSALS

Daniel Harney, PhD
Grants and Awards Editor
Office of the Vice Dean, Research & Innovation
Takeaways for Today:

• **Principle 1: Grant Writing is a genre:**
  • Reviewers’ expect you to make specific, pre-conceived “moves.”
  • Strong grant writing can be learned.
  • Good grant writing is strategic storytelling that leverages data and emotions

• **Principle 2: Strong grant writers cater to their reviewers:**
  • Good grant writing persuades reviewers to become *advocates* of the proposed research
  • Style/formatting elements draw *multidisciplinary* reviewers’ eyes to key elements of the proposal and improve the reading experience.
The Proposal Triangle

Project Significance/Approach

Team

Resources
Proposal Timeline:

• **3 Months**: Write the Overall Goal and Each Specific Aim; Gather accompanying documents; Convene Internal Scientific Review Panel.

• **2 Months**: begin writing body of grant proposal.

• **3 Weeks**: Provide draft to Internal Review Panel

• **2 Weeks**: Meet with Internal Peer Review Panel and submit to Editorial Review.
Write your Objectives First.

Weak Objective:
We aim to:
1. Better understand the effects of family, environment, and language skills on preparedness for kindergarten.

Strong Objective:
We aim to:
1. Determine the key factors that predict success or failure in transition from preschool to kindergarten. (Years 1-2)
Avoid Indeterminate Objectives:

• To explore the reasons for...
• To study the effects of...
• To better understand why...
• To improve our understanding of...
Case Study 1: Lay Summary

• What is the problem?
• Why is it significant?
• What is the gap in the existing knowledge?
• Why should we know more?
• Why do you think your approach will have better outcomes?
• What’s new/original/creative about it?
• What will the impact of this research be?
Formatting Matters
Formatting Matters
Case Study 2: Proposal Introduction

“Introduction: This project will test if artificially induced venous return during 70° head-up tilt with functional electrical stimulation can be used in incomplete sub-acute (< 3 months) individuals with SCI as a therapeutic intervention to help them cope with orthostatic stress. Individuals who had SCI at the L4 neurological level or higher are likely to have difficulties activating a venous pump due to partial or complete lower limb paralysis.”
Tip #1: Situate multidisciplinary reviewers within the health, social and economic context of your research.

“Introduction: SCI affect approximately 86,000 Canadians and not only have a devastating impact on the quality of life of individuals and their caretakers, but also pose an estimated $2.7B economic burden on the Canadian economy.
Tip #2: State the problem you’re proposing to solve.

“Introduction: SCI affect approximately 86,000 Canadians and not only have a devastating impact on the quality of life of individuals and their caretakers, but also pose an estimated $2.7B economic burden on the Canadian economy. Following spinal cord injury, many patients are unable to upregulate their blood pressure.”
Tip #3: Define your terms. “Your reviewer is not as familiar as you are.”

"Introduction: Spinal cord injuries (SCI) affect approximately 86,000 Canadians and not only have a devastating impact on the quality of life of individuals and their caretakers, but also pose an estimated $2.7B economic burden on the Canadian economy. Following spinal cord injury, many patients are unable to upregulate their blood pressure. When patients are transferred from a supine position into an upright sitting or standing posture, they experience lightheadedness and may lose consciousness. These are typical symptoms of orthostatic stress."
“Introduction: Spinal cord injuries (SCI) affect approximately 86,000 Canadians and not only have a devastating impact on the quality of life of individuals and their caretakers, but also pose an estimated $2.7B economic burden on the Canadian economy. Following spinal cord injury, many patients are unable to upregulate their blood pressure. When patients are transferred from a supine position into an upright sitting or standing posture, they experience lightheadedness and may lose consciousness. These are typical symptoms of orthostatic stress. Inadequate treatment options for this condition currently result in delayed rehabilitation for SCI patients.
Tip #5: Present preliminary data and expertise that will enable you to execute the project.

“Introduction: Spinal cord injuries (SCI) affect approximately 86,000 Canadians and not only have a devastating impact on the quality of life of individuals and their caretakers, but also pose an estimated $2.7B economic burden on the Canadian economy. Following spinal cord injury, many patients are unable to upregulate their blood pressure. When patients are transferred from a supine position into an upright sitting or standing posture, they experience lightheadedness and may lose consciousness. These are typical symptoms of orthostatic stress. Inadequate treatment options for this condition currently result in delayed rehabilitation for SCI patients. We recently demonstrated an artificially reactivated venous pump by combining electrically induced muscle contractions in the legs with passive leg movements.
Tip #6: Explicitly connect your preliminary data to your proposed project.

“Introduction: Spinal cord injuries (SCI) affect approximately 86,000 Canadians and not only have a devastating impact on the quality of life of individuals and their caretakers, but also pose an estimated $2.7B economic burden on the Canadian economy. Following spinal cord injury, many patients are unable to upregulate their blood pressure. When patients are transferred from a supine position into an upright sitting or standing posture, they experience lightheadedness and may lose consciousness. These are typical symptoms of orthostatic stress. Inadequate treatment options for this condition currently result in delayed rehabilitation for SCI patients. We recently demonstrated an artificially reactivated venous pump by combining electrically induced muscle contractions in the legs with passive leg movements. We propose to test this therapeutic intervention during 70° head-up tilt with functional electrical stimulation with incomplete sub-acute (<3 months) SCI individuals.
Tip #7: Describe concrete outcomes and impact.

“Introduction: Spinal cord injuries (SCI) affect approximately 86,000 Canadians and not only have a devastating impact on the quality of life of individuals and their caretakers, but also pose an estimated $2.7B economic burden on the Canadian economy. Following spinal cord injury, many patients are unable to upregulate their blood pressure. When patients are transferred from a supine position into an upright sitting or standing posture, they experience lightheadedness and may lose consciousness. These are typical symptoms of orthostatic stress. Inadequate treatment options for this condition currently result in delayed rehabilitation for SCI patients. We recently demonstrated an artificially reactivated venous pump by combining electrically induced muscle contractions in the legs with passive leg movements. We propose to test this therapeutic intervention during 70° head-up tilt with functional electrical stimulation with incomplete sub-acute (<3 months) SCI individuals. The intervention will enable this patient population to participate sooner and more successfully in their activities of daily living and in their rehabilitation programs, thereby improving patient outcomes and lowering healthcare expenses.”
Contextualize and engender enthusiasm for your project through storytelling.

“Consider a patient admitted to the hospital with a stab wound who suddenly loses blood pressure. Currently, clinical staff must guess as to whether they are responding to the stab wound, bacteria on the knife, or treatments that they themselves have administered. Most interventions have potentially harmful side-effects, and many established treatments are not associated with improved outcomes in randomized controlled trials. Often, clinical staff compare a given patient to their prior cases and find the most similar case using a mental model. However, parameters for similarity will vary by staff experience and seniority, and even the most experienced clinicians may not take into account all the ways that patients may respond differently to treatment. It is therefore critical to develop representations or health phenotypes that are robust representations of patient state.”
Core Facilities and Services in the Faculty of Medicine

Natasha Christie-Holmes
Research Operations Officer, Faculty of Medicine
natasha.christie@utoronto.ca
Dedicated management teams to provide specific technical expertise, training and protocol development assistance for research personnel.

Maximizing the impact of funding success to propel research at a Faculty-wide level and support future grant applications.

Supported through cost-recovery structures and strategic planning of grant-associated operational funding.

https://medicine.utoronto.ca/core-facilities-services
Division of Comparative Medicine (DCM)

- Director: Kate Banks
- Associate Director: Karen Parisien
- http://www.dcm.utoronto.ca/
- Federally and Provincially accredited Animal Care program at the Faculty of Medicine
- Preeminent veterinary technical staff including 5 Masters level animal technicians
- Over 60,000 ft² dedicated to in vivo research, including germfree, gnotobiotics and SPF+ exclusion
- Multiple full animal imaging modalities on-site supported by dedicated technical expert
Microscopy Imaging Lab (MIL)

- Director: Stephen Girardin, PhD
- Manager: Lindsey Fiddes, PhD
- Consolidated microscopy core including confocal, fluorescence, scanning (SEM) and transmission (TEM) electron microscopes
- Expert technical team trains research personnel in microscopy techniques and development of protocols
- Dedicated preparatory lab for SEM/TEM samples, Equipped for Cryo-TEM preparation
- Providing full-service microscopy (prep and scanning)
Flow Cytometry Facility

- Director: Tania Watts, PhD
- Manager: Dionne White
- [http://flowcytometry.utoronto.ca/](http://flowcytometry.utoronto.ca/)
- Equipped with 7 analyzers (3 to 5 laser each; up to 18 colour acquisition) and 3 cell sorters allowing for large multiparameter analysis
- Supported by dedicated operators with extensive FCM knowledge and over 20 years of experience
- Comprehensive training program partnership with Expert Cytometry(ExCyte™) and SickKids Hospital for research personnel
**Diet, Digestive tract and Disease (3D) facility**

- Director: Herb Gaisano, PhD
- Manager: Alexandre Hardy, PhD
- Multiple analytic platforms to facilitate molecular investigations
- Various imaging platforms from molecular level to full small animal scans
- Partnership with DCM to provide technical expertise in animal imaging
Combined Containment Level 3 (C-CL3) Unit

- Director: Scott Gray-Owen, PhD
- Manager: Natasha Christie-Holmes, PhD
- Federally licensed facilities for research involving RG3 pathogens
- Dedicated regulatory team providing guidance, validation and oversight
- Facilities for small animal in vivo studies and molecular in vitro research
Central Sterilization Service (CSS)

- Providing glass-washing, laundry and sterilization services
- Centralized stock of glass and plasticware for all MSB researchers to access
- Multiple sterilization cycles daily allowing flexibility for lab schedules
- After-hours autoclaves available to trained users
MedStore and MedPRINT
http://www.uoftmedstore.com/
https://uoftmedprint.com/

• Research materials store with UofT preferred pricing from vendors
• 3D printing service specializing in research applications
• Conveniently located in the Medical Sciences Building