GRANT DEVELOPMENT: EXAMPLES AND TIPS

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WORKSHOP OVERVIEW

- **Agenda:**
  1. Benefits of Grant Development through OVDRI
  2. How reviewers read grant proposals
  3. Tips for balancing elements of a proposal
  4. Examples of successful grant language
BENEFITS OF AN EDITORIAL REVIEW

• Maximizing the rhetorical impact of the research
• Reorganizing for most effective structure
• Improving layout and adding headings to make it easier for reviewers to navigate a proposal
• Correcting grammar, usage, spelling, and punctuation
• Identifying repetitive, unclear, or illogical ideas
• Aligning draft proposal with formatting guidelines
• Ensuring all criteria have been met
Academic writing:

- Researcher-centered: Scholarly passion
- Past oriented: Work you have done
- Expository: Explaining to reader
- Impersonal: Objective, dispassionate
- Individualistic: Usually solo activity
- Verbosity rewarded: Few length constraints
- Specialized terminology: “Insider jargon”

World of ideas
Thesis, theme, theory

Grant writing:

- Sponsor-centered: Service attitude
- Future oriented: Work you wish to do
- Persuasive: “Sell” the reader
- Personal: Convey excitement
- Team-oriented: Feedback needed
- Brevity rewarded: Strict length constraints
- Accessible language: Broad audience

World of action
Project, activities, outcomes

Courtesy of Robert Porter, PhD “Coaching Researchers to Write Successful Grants”
WRITE WITH THE REVIEWER IN MIND

• **Reviewers are:**
  • Intelligent readers
  • Experts, but perhaps not in your specific field
  • Reading in non-ideal settings
  • Reading with “tired eyes”
  • Reading in multiple sittings
  • Relying on clear summaries and abstracts to refresh their memories of your proposal.
  • Quick to equate sloppy writing errors with sloppy research practices.
ANTICIPATING COMMON NEGATIVE REVIEWER FEEDBACK

- **Feasibility:** “Although the stated outcome is the identification of new therapeutic targets, the path to how this work in animal models will be expanded into that direction is not stated.”

- **Ambition:** “The proposed research does not move into new areas of exploration in the field.”

- **Translation:** “No clear description of KT or possible impact of research.”

- **Expertise:** “Unclear that the PI has the technical expertise necessary to carry out the research and use the infrastructure he requests.”

- **Coherence:** “Projects proposed seem unrelated to each other and do not offer a unified program of research.”
SUMMARIES ARE IMPORTANT

- Summaries aid in selecting appropriate peer-review committees.
- Summaries are used by committee members to determine their level of expertise for reviewing the application.
- Internal Summaries reiterate key claims at the end of sections.
- Reviewers use summaries to refresh their memories of the key scientific points of a proposal.
- Summaries generate Interest and Excitement.
“Fungi have a devastating impact on human health. They infect billions of people worldwide and kill over 1.5 million per year\(^1\). The most vulnerable are immunocompromised individuals, including those undergoing chemotherapy or transplants, and those infected with HIV. The frequency of invasive fungal infections has increased by over 200% in recent years\(^2\), with the surge in immune deficiencies. These infections impose a major public health burden with \(>\$10\) billion in treatment costs and mortality rates of 30-90%, depending on the pathogen and patient population\(^3\).

Candida species account for 88% of all hospital-acquired fungal infections in the United States\(^3\). In Canada, they are the third most prevalent cause of bloodstream infections in hospitalized patients\(^2\). […] Candida auris is an emerging pathogen that has been classified as a serious global health threat by the Centers for Disease Control and Prevention; it is spreading rapidly and is resistant to all antifungal drugs\(^4\).”
Cardiovascular Perinatal and Molecular Therapeutics

Cardiovascular disease is the leading cause of suffering and death in Canada. A new challenge in the emerging epidemic of heart failure whose term in five Canadians will eventually die from heart failure. The molecular basis of heart failure is complex and poorly understood. This project is aimed at providing a detailed mechanistic insight into the rate, ultimate both of cardiac and pulmonary binding proteins in the development of heart failure. During the course of our existing CRC, we completed a large scale proteomic investigation of heart failure using a mouse model of heart failure. The goal of this project is to identify novel targets for future therapeutic intervention and identification of new drugs to alter the course of disease. The specific aim is to identify new therapeutic targets for future therapeutic intervention and identification of new drugs to alter the course of disease.

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Cardiovascular Therapeutics

Project Synopsis

Heart failure disease is the leading cause of suffering and death in Canada. A new challenge for managing the syndrome of heart failure (HF) to increase life expectancy in Canada will undoubtedly effect heart failure. The molecular basis for heart failure is complex and poorly understood. This project is aimed at providing a detailed mechanistic insight into the disease and identifying the role of calcium in regulating blood pressure in the development of heart failure. Due to the complex nature of HF, we completed a large scale proteinomic investigation of mouse and human heart failure and heart failure patients of a Canadian Heart Project entitled “Protein Expression Profiling Human the Heart Disease Human Discovery.” We propose to extend our findings from the study by developing advanced proteomic techniques (PTP) using pooled protein networks in heart failure. We will use the information to identify novel cellular targets for therapeutic intervention and manipulate these targets in an attempt to alter the course of disease. Our specific research goals are: 1) development of new proteomic technologies for the analysis of cell lines, mouse, and human heart failure models, 2) identification of key protein interactions and pathways involved in cardiac disease progression, and 3) translation of these findings to clinical applications and disease.

Objectives

1. To identify the key proteins and pathways involved in the development and progression of heart failure in mouse models.
2. To validate the findings in human heart failure patients.
3. To develop novel therapeutic strategies for the treatment of heart failure.

Methodology

We will use a combination of proteomic approaches, including 2D gel electrophoresis, mass spectrometry, and bioinformatics tools, to identify key protein interactions and pathways involved in cardiac disease progression. We will then validate these findings in human heart failure patients and develop novel therapeutic strategies for the treatment of heart failure.

In the event of significant findings, we anticipate that this research will provide new insights into the molecular mechanisms underlying heart failure and identify novel therapeutic targets. This research will also have the potential to significantly impact the treatment of heart failure in patients.
SHOW, DON’T TELL

• Rule: Provide concrete examples of what you have done or plan to do.

• Original: “The proposed research program is expected to attract highly qualified personnel. The research is ground-breaking, addresses some of the most pressing questions in the field and uses leading-edge infrastructure in a variety of experimental methods. In addition, the research environment is very supportive. Dr. Smith will work with each trainee but also give them space to think critically for themselves.”
**Show, Don’t Tell**

- **Revised:** “Given the worldwide interest in genetics, the proposed research program will attract highly qualified personnel eager to learn leading-edge technologies for microbial genomics. Dr. Smith’s research program includes a comprehensive mentorship plan to enable trainees to enter academia or industry. HQP will have weekly meetings with Dr. Smith to troubleshoot and discuss milestones. They will learn techniques including microscopy, high-throughput screening, and microsurgery. All trainees will have opportunities to serve as mentors to a junior HQP, building leadership and project management skills.”
CONCISION

• Rule: Look for superfluous language that can be removed without altering the meaning of the sentence.

• “In terms of measures, we found that there are currently robust measures that emphasize biomedical factors.”
• “There are robust measures that emphasize biomedical factors.”

• “The infrastructure is absolutely critical to enable Dr. Smith to be able to conduct his program.”
• “The infrastructure is critical to Dr. Smith’s program.”
CONCLUSION

- Rule: Shorten long sentences by reversing the order of the subjects.

- “The training that the HQP will receive using the requested infrastructure will provide them with a competitive skillset.”

- “The requested infrastructure will provide HQP with a competitive skillset.”
“Underscoring the importance of understanding the function of these molecules are several recent reports implicating dysregulation of FCRL family members in autoimmune disorders and infectious diseases.”
“Several recent reports implicating dysregulation of FCRL family members in autoimmune disorders and infectious diseases underscore the importance of understanding the function of these molecules.”
INFORMATION VS. COMPREHENSION

Rule: Present complex information in multiple formats and in multiple locations in the proposal to reduce information overload.

Original:

“Our findings, in association with our collaborators (see list of co-PIs in Section 2) will lead to the development (in Years 1-2) of an app that when launched (initially for iPhones only) will provide Canadians at risk for diabetes with access to overviews of relevant recent health policies (imported from Health Canada and the Ontario Ministry of Health and Long-Term Care), healthy food choices (low sodium, low fat, vegetables and fruits) available in grocery stores (we have secured memorandums of understanding with stores in the GTA) and nutritional data from major chain restaurants, which can be tracked in the app.”
INFORMATION VS. COMPREHENSION

Revised as an Overview/Summary:
“Our findings will aid in the design of an app that will inform Canadians about new dietary policies, and help high-risk populations make healthier food choices in grocery stores and restaurants by providing them with nutritional data.”
Revised for Internal Summary:

“The proposed research project will lead to the development of an iPhone app that in year 3 of the project will go live and enable Canadians to:

1.) understand new federal and provincial health policies;
2.) identify healthier food choices (low sodium, low fat, vegetables and fruits);
3.) Access nutritional data from restaurants and grocery stores
4.) Record and track their own food intake.”
LEAD SENTENCES

• Original:

“Trainees will be located on the 5th floor of the Research Lab at UofT, where they will be provided with office space, computer and IT support. Trainees will present their research and collectively problem solve during monthly laboratory team meetings. They will have networking and presentation opportunities through meetings with the Scientific Steering Committee, as well as annual Research Days. Dr. Smith will ensure that students have opportunities to present at seminars with experts from leading programs in biomolecular research.”
• Revised:

“Mentorship will include providing trainees with opportunities to present their research in a variety of settings. Trainees will present their research and collectively problem solve during monthly laboratory team meetings. Trainees will have networking and presentation opportunities through meetings with the Scientific Steering Committee, as well as annual Research Days. Dr. Smith will ensure that students have opportunities to present at seminars with experts from leading programs in biomolecular research.”
“Although Dr. Smith’s research is in basic science, it may lead eventually to the development of drugs that could someday be useful to some patients experiencing chronic pain.”
Revision: “Dr. Smith’s proposal will open new research avenues and lead to critical collaborations between her and leading-edge researchers at UofT. As her impressive $8,100,000 in secured research funding attests, Dr. Smith’s research breaks barriers in the field of chronic pain and has already demonstrated impact internationally.”
2017 Workshop: Strategies for Innovation and Grant Writing

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