

CIHR GRANTS

**SUMMARY PAGE
LAY ABSTRACT**

EXAMPLES

OPERATING GRANT

SCHOLARSHIP

RESEARCH PROPOSAL SUMMARY

Include:

- Title and summary that should be written with the supervisor
- specific hypothesis of the research
- describe the candidate's role on the project
- written in general scientific language
- **Maximum 1 page** including references
- references can be written in a smaller font, but must be legible

- Introduce the health problem and how you will be address it
- Capture the attention and interest of the reviewer
- Provide a compelling rationale for why the research needs to be done
- How and why is your proposal exciting?

Background:

- introduce the field and why the field is important
- highlight what is not known in the field and why it is important to solve these unanswered questions

- State WHY you are undertaking the proposed research, or a particular experiment.

Examples:

- "To identify molecular regulators of axonal guidance, we will..." or
- "To establish what family members think about genetic testing, we will..."

- CIHR is a hypothesis-based competition
 - a clear statement of your **hypothesis** or objective
- “We hypothesize that [] will [].”
- Then follow with ... “To test this hypothesis, we have [three] Specific Aims: ... ” [then state these aims]

2. Bulleted paragraphs that summarize your **specific aims**.

- What you intend to do.
- Emphasize it (**bold font**).
- “**Specific Aim 1** will determine...”

- Clear, specific aims that will test your hypothesis
- Aims must be feasible within your proposed project timeline
- Aims have to be big enough to stand alone (not just a few experiments)

- Brief summary of the methodology
- State WHY you are using a specific strategy

Example:

- "Our approach will be to identify homologues of CUB domain proteins expressed in the developing brain using [xxx method]..."

3. Concluding statement(s) that highlights the significance of the work (disease link if possible)
 - include immediate and tangible impact

Example:

- "This work will enhance the understanding of the biology of... and to provide a foundation for elucidating [disease]."

- avoid jargon and abbreviations (if possible)
- keep the topic focused
- clearly and concisely state the goals of the research in words that can be easily understood
- after reading the summary page, reviewers should know something about your field, what isn't known in the field, and what your general approach will be in solving the unresolved problems

Be sure to address:

- what you want to do?
- How you will do it?
- why it is important to do?
- what the data will tell us?

EXAMPLE

Characterization of novel small molecule EPI-001 in mutated androgen receptor from prostate cancer patients

Background: Currently, all therapies for advanced prostate cancer target the C-terminal ligand-binding domain (LBD) of androgen receptor (AR), such as androgen ablation and application of antiandrogens. All of these therapies eventually fail to treat lethal castration-resistant prostate cancer (CRPC) by potential mechanisms including: over-expression of AR; gain-of-function mutations of AR; over-expression of AR coactivators; intracrine signaling by intratumoral androgens; ligand-independent activation by growth factors, cytokines, or kinases; and/or expression of constitutively active splice variants of AR that lack the LBD. Transcriptional activity of AR resides in its N-terminal domain (NTD), and recently we have identified the first small molecule inhibitor of the AR-NTD, EPI-001 to cause significant regression of CRPC in mice, yielding great promise for clinical development.

Objective/Hypotheses: The objective is to characterize EPI-001 in clinically relevant AR mutants. Three specific aims will test the hypotheses that EPI-001 designed to target the AR-NTD will inhibit the activity of gain-of-function mutations in the AR-LBD from prostate cancer patients with resistance to antiandrogens, and resistance to EPI-001 will not occur by a mechanism of mutations in AR.

Specific Aim 1 will determine if long-term exposure with EPI-001 causes resistance in human prostate cancer cells lines. LNCaP and MDA PCa2B cells treated with EPI-001 will be cultured for up to one year, or until the cells begin to grow in the presence of EPI-001 inferring resistance. For control, a parallel set of each cell line will also be cultured for the same period of time with only vehicle treated. Suspected mechanisms of resistance will be examined by: QRT-PCR and western blot analysis to measure levels of expression of AR and coactivators; AR sequence analysis to identify mutations, and Affymetrix gene expression analysis. **Specific Aim 2** will investigate if EPI-001 inhibits the activity of clinically relevant AR mutations originally identified in patients with resistance to antiandrogens. Several AR-specific reporter gene constructs will be used to examine if EPI-001 inhibits the transcriptional activity of these gain-of-function mutants. CV-1 and DU145 do not express endogenous AR and will be co-transfected with the AR reporter gene constructs and expression vectors for wild-type AR or the various mutants to reveal effects on transcriptional activity of AR. Any mutations identified in Aim 1 will be cloned and also tested. **Specific Aim 3** will examine if resistance to EPI-001 develops in castrated SCID male mice with LNCaP xenografts. After EPI-001 treatment causing tumour regression, treatment will be ceased in half of the animals. Tumour volumes will be carefully monitored to see if regression continues. If the tumours start to grow, treatment will start again to see if EPI-001 will inhibit the growth of tumours previously exposed to EPI-001. Finally tumours will be harvested and prepared for: immunohistochemistry; measurement of protein levels, and RNA extraction for analysis of gene expression and AR sequencing to determine mutations.

Significance: Unfortunately there are no long-term effective therapies to treat CRPC, and once the disease becomes CRPC, death is unavoidable within two years. Around the world, there is an urgent request for the development of new therapy to treat CRPC. The AR-NTD plays an important role in the disease progression, indicating therapeutic potentials. Recently EPI-001, the first AR-NTD inhibitor has been reported by our lab, with promising results for clinical application. Further characterization of EPI-001 will provide crucial information for future clinical development.

LAY ABSTRACT

- Considered a major determinant for success of funding

LAY ABSTRACT

- What makes your work interesting?
- How will your findings make a difference in the world?

- A lay abstract is not a ‘dumbed down’ version, but a clear, plain explanation of the research
- Lay abstracts provide the context for the research
- Purpose of the research, its background significance, and the proposed methodology

- describe the “big picture”
- help people more easily understand the details of your research
- communicate to a wide audience
 - Non-expert reviewers
 - Patients/advocates
 - Press releases
 - Attracting donors
 - Fund raising and government lobbying

- Balance between over-simplification and explaining the details of cutting-edge research
- Balance between accuracy and information overload

- Clear, plain language explanation of the research project
- State the outcomes
- Big picture of the research and why it is important

PROPRIETARY/CONFIDENTIAL INFORMATION

- No proprietary confidential information!

- who is the audience?
- what is the story you are telling?
- why does it matter?
- why now?
- why you?

- The 'so what?' test
- What impact is your research likely to have?
- What piece of the larger research puzzle is your research trying to address?
- Place your work in a larger context
- Describe clearly the **relevance** of the research to health problems or disease

- Short and simple
- Grasps the main point
- Enticing
- Example: “The Silver Bullet: Targeted Drug Delivery”, Felicity Leng

- The first sentence is crucial
- Examples:
- “Every two minutes somebody in the UK is diagnosed with cancer. Current treatment for cancer relies on invasive surgery or drugs, which can have dreadful side effects.” **Felicity Leng**
- “Try reading this paragraph without moving your eyes from the full stop at the end of this sentence, and you will find the task impossible. The reason for this is that our peripheral vision is far less clear than our central vision, meaning that our perception is full of gaps.” **Matthew Mould**
- Need to engage the reader and invite them to read on

- Have a friend or a family member point out the phrases and concepts that they don't understand.
 - an iterative back and forth dialog with numerous revisions
- Ensure that the average person can relate to the problem

EXAMPLE

Current treatment for prostate cancer includes surgical or drug treatment meant to stop the production of androgens (male hormones) that enhance tumor growth. However, in some patients the cancer grows again without androgens into an advanced stage. Unfortunately, there are no cures for this type of prostate cancer and standard therapies may increase survival by only about two months. In order to grow and survive, prostate cancer cells depend on the androgen receptor, a protein which has an important role in encoding genetic information. Our team has recently identified EPI 001, a drug extracted from a marine sponge, that could decrease the tumour volumes without apparent toxic effects in laboratory mice. This drug is a very promising therapeutic agent for advanced prostate cancer. We aim to identify similar potent drugs, by studying the characteristics and effects of this drug. Our studies have shown that EPI 001 acts by inhibiting the androgen receptor activities. In this project, we will identify other proteins that interact with the androgen receptor and change its activity. We hypothesize that inhibiting these proteins by interrupting their interaction with the androgen receptor will stop the growth of tumors in advanced prostate cancer and will be an effective drug target. To prove this hypothesis we will test the effects of EPI 001 on the interactions of androgen receptor and these proteins. If the EPI 001 is interrupting the interactions of AR and the new proteins, other agents that target the same interactions can be potential drugs for cancer treatment. This study will lead to discovery of new targets to delay or cure advanced prostate cancer.

WRITING TIPS FOR LAY ABSTRACTS

- Write your lay abstract as if it's for a major broadsheet newspaper
- Set the scene carefully,
- Explain how your work fits into the bigger picture.
- Give the reader a reason to care about what you do
- Explain how your work will help people, even if this is a long way off.
- What's the wow factor? Does it inspire?
- Focus on the relevance, the application or the benefits. The 'so what' factor. Why is the work important?

WRITING TIPS FOR LAY ABSTRACTS

- Be specific. Can you include a fascinating fact?
- Make it easy for the reader. Don't have to guess what you mean.
- Practice reading your sentences out loud. Did you run out of steam or get confused by the end?
- Provide context. Give concrete (everyday) examples. Paint a picture for the reader.
- Get to the point.
- Avoid ambiguity.
- Don't introduce secondary ideas.

GENERAL WRITING TIPS

- smaller, shorter words (e.g., use instead of utilize)
- use common everyday words
- avoid complex logical arguments – be brief
- short sentences (15-20 words)
- use analogies and relate science to everyday life
- Use commonly used phrases and explanations of what key scientific terms mean
- grade ten level language

FLESCH-KINCAID GRADE FORMULA AND FLESCH-READING EASE FORMULA

- calculates level of reading grade and ease: 0 to 100 (easiest)
- uses average sentence length and average syllables per word to assess the ease of reading.
- simplify your grammar
- use active voice
- omit sentences that add no meaning

SPELLING AND GRAMMAR

- Check spelling, grammar and punctuation.
- Any mistakes will undermine your message.
- These are all part of the quality of presentation and presentation matters!

- Follow the guidelines!
- If there are guidelines such as 250 words max and a title, then ensure that's what you provide
- Font and margins
- Page number

CIHR FORMATTING

Instructions for preparing and formatting attachment documents.

The following applies to **all attachments** (including those for the Common CV):

- 1) Indicate your name, the project title and the section title (e.g., Summary of Research Proposal) at the top of each page.
- 2) Indicate the page number clearly at the bottom of each page.
- 3) *For CV attachments, only your name and the section title (e.g., Patents and Intellectual Property Rights) are required in the header.*
- 4) Insert a **margin of 2 cm** (3/4 inch) - minimum - around the page.
- 5) Observe page limitations, additional pages may **NOT** be added unless specified.
- 6) Use only **letter size** (21.25 X 27.5 cm / 8.5" X 11") white paper/background for all attachments.
- 7) Photo-reduce the supporting documents if the originals are larger than (21.25 X 27.5 cm / 8.5" X 11").
- 8) Use a font size of **12 point, black type**.
- 9) **Six lines per inch**. No condensed type or spacing.
- 10) Attachments must be uploaded in **PDF format**.
- 11) The size of the attached document(s) cannot exceed 30 MB per document.

- Overambitious
- Unfocused
- Limited Aims
- Uncertain future directions
- Doesn't test the hypothesis

Significance

- Fail to put in relation to your field - relevance
- Incremental low impact
- Weak rationale
- Not significant (not exciting, not novel)

More Information

- <http://muhc.ca/research/page/grant-writing-tips>
- <http://www.cihr-irsc.gc.ca/e/27491.html>
- CIHR MASTERS AWARD
<http://www.cihr.gc.ca/e/39310.html>
- CIHR DOCTORAL AWARD
<http://www.cihr-irsc.gc.ca/e/38887.html>