THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Pharmaceutical Sciences

Tips and Tricks on Applying to (Interdisciplinary) Grants and Establishing Collaborations as An Early Career Researcher

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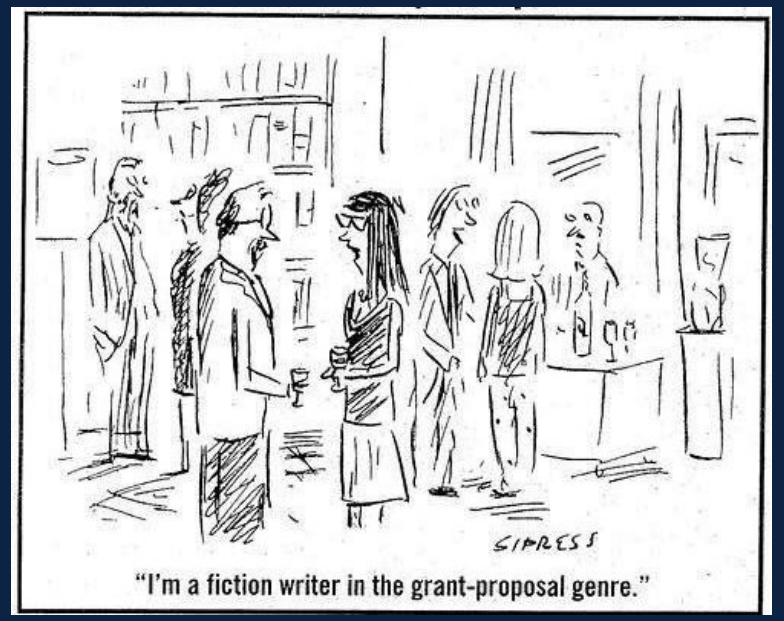


“Numbers numb, jargon jars, but nobody ever marched on Washington because of a pie chart.

Stories, by their very nature, tend to get stored in our brains. So, if you can change the story inside someone’s head, you’ve taken the first step to changing the world.”

-Andy Goodman

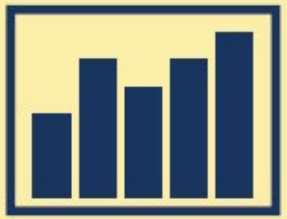
It's a *Story*, Not a Study: Writing an Effective Research Paper

Lorelei Lingard, PhD, professor, Department of Medicine, and Chris Watling, MD, PhD, associate professor, Department of Clinical Neurological Sciences, Schulich School of Medicine & Dentistry, Western University

Advice abounds for education researchers hoping to publish their work.[1–3] Authors are commonly told to include a clear question and purpose statement, at least one theoretical frame for the work, sufficiently detailed methods, balanced reporting of results, thoughtful limitations, and conclusions appropriate to the research design.

Helpful though such advice is, we think it misses the fundamental point. Because what separates a mediocre research paper from a great research paper is not such bits and pieces. It is something much more essential.

A decent research paper reports a study.



But a great research paper tells a story.

What's the difference between study and story?

First, the difference is structural:

- A study lives in the methods and results of a report.
- A story unfolds in the introduction and discussion/conclusion.

Second, the difference is rhetorical:

- The study must be reported accurately.
- The story must be told persuasively.

A good story is understandable, compelling, and memorable. It needs a good study at its core, but it uses that study as a launching point to contribute to a conversation in the world about a shared problem.

Below, we illustrate the standard manuscript format according to this story/study concept, detailing for each section the key questions writers should ask themselves in order to achieve a good story. While we distinguish between study and story for the sake of clarity, study and story likely interweave throughout a report's sections.

Introduction

What problem did you explore?[4]

What's the hook—why does the problem matter?

Literature review

What conversation are you joining?

What's the gap in knowledge?

Methods

What did you do?

What was the rationale for the research design?

Is the explanation accessible?

Weave together with style and clarity. Wield the tools of grammar, sentence structure, and paragraph organization wisely to engage and hold readers' attention.[5]

Conclusions

What's the key lesson from your story?

What is the inevitable story-in-waiting?

Discussion

How does your story add to the conversation?

How have you filled the gap?

How does the design limit your contribution?

Results

Who are the main characters in your results?

Have you illustrated them convincingly?

MOLECULAR STRUCTURE OF NUCLEIC ACIDS

A Structure for Deoxyribose Nucleic Acid

WE wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest.

A structure for nucleic acid has already been proposed by Pauling and Corey[1]. They kindly made their manuscript available to us in advance of publication. Their model consists of three inter-twined chains, with the phosphates near the fibre axis, and the bases on the outside. In our opinion, this structure is unsatisfactory for two reasons: (1) We believe that the material which gives the X-ray diagrams is the salt, not the free acid. Without the acidic hydrogen atoms it is not clear what forces would hold the structure together, especially as the negatively charged phosphates near the axis will repel each other. (2) Some of the van der Waals distances appear to be too small.

Another three-chain structure has also been suggested by Fraser (in the press). In his model the phosphates are on the outside and the bases on the inside, linked together by hydrogen bonds. This structure as described is rather ill-defined, and for this reason we shall not comment on it.

It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.

Full details of the structure, including the conditions assumed in building it, together with a set of co-ordinates for the atoms, will be published elsewhere.

We are much indebted to Dr. Jerry Donohue for constant advice and criticism, especially on inter-atomic distances. We have also been stimulated by a knowledge of the general nature of the unpublished experimental results and ideas of Dr. M. H. F. Wilkins, Dr. R. E. Franklin and their co-workers at King's College, London. One of us (J. D. W.) has been aided by a fellowship from the National Foundation for Infantile Paralysis.

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F. H. C. CRICK

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April 2.

[1] Pauling, L., and Corey, R. B., *Nature*, **171**, 346 (1953); *Proc. U.S. Nat. Acad. Sci.*, **39**, 84 (1953).

[2] Furberg, S., *Acta Chem. Scand.*, **6**, 634 (1952).

[3] Chargaff, E., for references see Zamenhof, S., Brawerman, G., and Chargaff, E., *Biochim. et Biophys. Acta*, **9**, 402 (1952).

[4] Wyatt, G. R., *J. Gen. Physiol.*, **36**, 201 (1952).

[5] Astbury, W. T., Symp. Soc. Exp. Biol. 1, Nucleic Acid, 66 (Camb. Univ. Press, 1947).

[6] Wilkins, M. H. F., and Randall, J. T., *Biochim. et Biophys. Acta*, **10**, 192 (1953).

List of grant-related resources

- **VPRI (https://research.ubc.ca/)**
  - Internal competitions (e.g. GCRC, RSFG, UKP, CRMA, CUES)
  - **SPARC (https://sparc.ubc.ca/)**
    - Program outreach
    - Project and proposal development including:
      - Sample grants
      - Application guides and templates
      - Consultations, editorial review and SWOT analyses of your proposals
      - Internal (peer) reviews
  - **IPO (https://ipo.ubc.ca/)**
    - Support for infrastructure awards (e.g. CFI, BCKDF)

Writing-related resources

Writing in the Sciences <https://www.coursera.org/learn/sciwrite/home/welcome**>**
by Dr. Kristin Sainani, Associate Professor Health Research and Policy (Stanford University)

This course teaches scientists to become more effective writers, using practical examples and exercises. Topics include: principles of good writing, tricks for writing faster and with less anxiety, the format of a scientific manuscript, peer review, grant writing, ethical issues in scientific publication, and writing for general audiences.

PharmSci PERL Seminar Resources from Dr. Sandra Jarvis Sellinger

This is an excellent collection of 1 page posters giving evidence-guided overviews on everything from writing manuscripts, editing, data analysis, presentation, using social media to promote your work etc.

Awards

Drafting letters for Awards

- Align your research/achievements with the mandate of the award
- Include a statement on how the referee knows you
- Provide context for some of the notable honours in your CV
    - E.g., “summa cum laude”, “one of 2 provincial awards”, “only award in this category”, “top of the committee”
- Provide context for the importance of your research achievements from the CV
    - E.g., “this was the first study to show xyz”
- Keep the letter writer’s qualifications, position, seniority in mind. Don’t include granular details about methods, specific transgenic animals,
    - (remember, you are drafting this on behalf of the referee)

Applying for research-related awards

Keep your CVs up-to-date

ORPA (https://prizes.research.ubc.ca/)

- Directory of award database
- Advice on specific awards
- Advice on awards planning and laddering for your career
- Reviewing and providing detailed feedback on draft nomination materials
- Arranging for Institutional letters of reference or nominations

EDI considerations for your proposals

- ***Make sure you understand the definitions*** of words like equity, diversity, inclusion, sex, gender, unconscious bias, systemic barriers. Often people think they know, but then misuse these terms.

- ***Keep in mind that diversity can be about many things***: sex, gender, age, socioeconomic status, physical abilities, age, education, sexual orientation, parental status/responsibility, immigration status, Indigenous status, religion, disability, language, race, place of origin, ethnicity, culture, and other attributes. What are some of the systemic barriers that occur in these groups? How do you show awareness of these barriers and minimizing/removing them?

- ***What have you done and are you doing*** to educate yourself about EDI practices? Have you attended some training sessions/workshops; taken online modules; participated in discussion groups? Etc. (see appendix 1 for some training opportunities)

- ***Consider your own privilege and unconscious biases***. Don't deny that you have them. We all do. Self-reflection is the first step in moving your research and training environment towards being more equitable and inclusive. This is not the place to claim to be an expert.

Courtesy of Dr. Wendy Robinson

Sex/Gender considerations in your research

A common question asked on many applications is: Are sex (biological) and gender (socio-cultural) considerations taken into account in this proposal? For more information, consult the CIHR guide to sex- and gender-based analysis.

- This question is asking about the research design. So saying you have a diverse lab group indicates that you do not understand the question.
- Don't mix up or synonymize sex and gender. These terms are not interchangeable (non-human animals may have sex (none/female/male/hermaphrodite) but do not have gender).
- Don't check "yes" if the answer is really "no". If sex and/or gender are not applicable to the study question, then check 'no' and explain why not.
- Gender of the research "participant" is not applicable if
  - (i) you are using an existing dataset/database where this information was not collected or
  - (ii) you are studying non-biological items, microbes, non-human animals, or fetal tissues (for example).

Courtesy of Dr. Wendy Robinson

Sex/Gender considerations in your research - cont'd

- Gender is also relevant to the researchers and any other humans involved in the work and/or KT.
- In most clinical studies, gender is relevant and can be considered as a social determinant of health. Keep in mind that gender identity is not confined to a binary (girl/woman, boy/man) nor is it static; it exists along a continuum and can change over time. Also note that infants, toddlers, and most young children are too young for self-identity.
- Sex is almost always applicable to a study, unless the study is limited to non-biological items, molecular biology of proteins or pathogens in an acellular environment.
- There are many sex differences at the cellular level. Thus, sex of samples (even cell lines) should be reported and considered in the study design. Are there sufficient numbers of samples from all sexes to analyze the potential effects of effects? If possible, results should be disaggregated by sex, not only corrected for sex in the analysis.
- Be clear about how sex is defined. Most commonly, research uses an individual's self-reported legal sex, their sex assigned at birth, or chromosomal sex (presence/absence of a Y chromosome). These can be discordant and the nuance between how sex is defined can matter scientifically. Explain this if/when it is relevant to your work.

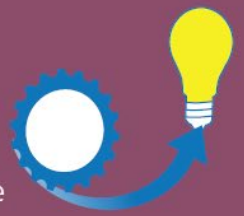
Link to the Govt of Canada's course on GBA+:
https://women-gender-equality.canada.ca/gbaplus-course-cours-acsplus/eng/mod01/mod01_01_01.html

Courtesy of Dr. Wendy Robinson

“Don’t try to map out your career path too early, and don’t be afraid to say yes to new opportunities as they come up.”

(Michael Coughtrie,
Dean of the Faculty of Pharmaceutical Sciences)

The Ethics and Etiquette of Research Collaboration

Research Dilemmas	Ethical Considerations Recommending and defending right and wrong conduct	Etiquette Considerations Expectations for accepted behaviors
I am currently collaborating on a research team, and I have a spin-off idea. What are my obligations to include the original study team in my spin-off work? 	• Research data are considered an asset of the principal investigator's institution.[1] • Withholding evidence and/or findings from the team that germinate during the research process is akin to interference and could be considered misconduct.[1]	• Consider using a written collaboration agreement between authors to clarify access to original data and expectations around future use and publication. • For each collaborator, ask: *Would I have had this new idea without this team member?* If not, consider inviting him/her to collaborate on the spin-off study.
When should I add or remove a collaborator from the research team?  	Authorship guidelines require participation[2]: • In conception and design OR data collection and analysis, AND • In drafting or revising the publication critically, AND • Via approval of final publication, AND • Via following up on all integrity and accuracy inquiries.	**Adding an author:** Determine if the individual will make significant contributions by moving the research forward without compromising other team members' responsibilities.[2] Always confer with the team and, if one is available, refer to the written agreement first. **Removing an author:** Document why expectations have not been met, and offer the opportunity to meet authorship requirements. If expectations cannot be met, determine if a mention in the acknowledgments section is appropriate.

The Ethics and Etiquette of Research Collaboration

Recommended Practices:

Early in the collaboration, explicitly discuss with the team:

1. Author requirements
2. How extensions of the study will be handled
3. A written collaboration agreement for authors

Why do you want to collaborate?

- To meet my organization's/granting agency's requirements
- To be able to work closer with my peers
- To attract research funding
- To increase the impact of my research (including publications)
- I'd rather not collaborate if it were up to me

Some benefits of collaboration as a researcher

- **Future:** those you collaborate with today will think of you tomorrow when they are putting together a € 20,000,000 grant proposal.
- **Criticism:** collaborators are more likely to tell you, that in reality the emperor is not wearing any clothes. Debating ideas is also important for creativity and achieving Group Genius
- **Ability to bring more experience to bear:** tapping into the distributed intelligence of a group increases you chances of solving problems more efficiently.
- **Wider array of techniques:** a collaboration across lab groups, departments or institutions widens the access to a greater number of tools and techniques used for research.
- **Agility:** it is far more likely that you can exploit an unexpected finding in the setting of a collaboration.
- **Early adopters:** your collaboration partners are almost by definition your early adopters for your novel approach, new technology, or new hypothesis.

Adapted from: https://blog.globalacademyjobs.com/20-benefits-of-collaboration-as-a-researcher-you-cannot-afford-to-ignore/

Green College Leading Scholars Program

Since 2014, the Green College Leading Scholars Program has provided opportunities for UBC faculty members newly appointed at the rank of Assistant Professor or Assistant Professor of Teaching (tenure-track) to make connections across disciplines while sharing ideas in a convivial setting.

The appointment is for a **two-year period**, after which Leading Scholars have the option of continuing as Members of Common Room at Green College for a further two years.

In their first year, Leading Scholars meet several times in groups before and over dinner.

In the second year, they organize and host one or more series of presentations as part of the College's interdisciplinary programming, for which they are **allocated a budget**.

https://greencollege.ubc.ca/leading-scholars-program

List of grant-related resources

- **ORS (https://ors.ubc.ca/)**
  - Research account setup including RPIF submission and spending limits
  - Finding funding or developing research grants;
  - Obtaining an institutional signature for a grant application;
  - Obtaining a compliance certificate for research involving human subjects, animals or biohazardous materials;
  - Transferring research funds to my collaborators at another institution;
  - Registering a clinical trial;
  - Finding information about research funding at UBC and its affiliated institutions.

- **UILO (https://uilo.ubc.ca/)**
  - The UILO enables research collaboration and innovation partnerships between researchers and industry, government and non-profit organizations.

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