

Manuscript and Grant writing

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Manuscripts: outline

- Title page
- Abstract (summary)
- Introduction
- Materials/methods
- Results
- Discussion
- Figures/tables
- References

Title Page: Title

- Declarative statement
- Something “flashy” to catch the reviewer’s and readers’ attention (e.g. A novel interaction between X and Y)
- Usually a limit of words/characters for title

Title Page: Authors

- Be generous with co-authors (good for careers)
- Incorporate collaborators from other labs

Title Page (Continued)

- Running title: brief version of title
- Key words: usually 4-6 (choose general words....)

Abstract

- Summary of manuscript, usually 150-250 words
- Organize as synopsis of manuscript:
 - Introduction
 - Results
 - Conclusions
 - No need to mention methods, except as approach to carry out experiments

Introduction

- Can be tough, but shouldn't be!
- Break up into “thirds”, that is, 3 sections with total length about 2-2.5 pages
 - First 1/3: Background (literature review)
 - Second 1/3: Significance of problem/issue
 - Third 1/3: Hypothesis and brief synopsis of results, emphasizing what is novel and implications

Materials and methods

- May follow introduction or end of manuscript, depending upon journal guidelines. About 4-6 pages
- Be somewhere between brief and exhaustive; can reference papers with well accepted methods (e.g. Northern blot) but add what may have been modified.
- Organize:
 - Study design
 - Study population
 - Data collection
 - Laboratory methods (if applicable)
 - Statistical analysis

Results

- Use subheadings, if journal allows
- Build a story
- Use figures as a guide in results section. Thus, plan figures according to outline.
- Figures: positive/negative controls; scan high-quality. Okay to say “data not shown” for some figures.
- Figure legends and results section should be complementary, not duplicative.
- Aim for 6-8 pages

Discussion

- Many parallels to introduction
- Use subheadings, if journal allows
- Rule of “thirds” can be re-applied
- First 1/3 section: Synopsis of results, emphasizing what is novel
- Second 1/3 section: Place in perspective of literature.

How has work added to literature (lit. review)?

How has work shed new insights?

Discussion (Continued)

- Third 1/3 section
 - Bring it all together
 - How has work led to new model? Okay to speculate
 - What might be future impact and directions?
 - Aim for length of 3 pages

Figures and Figure Legends

- Journal will dictate how many figures and tables allowed
- High-quality figures (“self-explanatory”)
- Tables can summarize numerical data
- Can have figure that shows model from work
- Figure legends: avoid duplication with results and methods. However, should explain data and mention methods (general fashion)

References

- Journal will dictate the format
- How many?
 - Probably 30-50
- Which ones?
 - Original publications are good
 - Seminal or key publications are good
 - General concepts can be supported by review articles (here choose, recent ones and those in top journals)

When Should I Submit Manuscript?

- Outline of literature, experiments/results and conclusion is important
- Outline of figures needed and build around that
- Timing is important.
 - Want to get as complete a story as possible, but also, not delay (others may finish before you)
- Okay to submit and can still do additional experiments as review process takes time
- Set goals and deadlines!

How Do I Choose a Journal for Submission?

- Work will influence choice of journal. Look through journals. Talk to people.
 - If work is very focused, then select a journal that is focused as well
 - If work is broad-based, then select a journal that is more general
- If work is very novel, then would try top journal initially.
 - Mechanism(s) is(are) important.
- Regardless, choose as high-impact journal as possible in the initial submission
- If necessary, have a “list” of journals to follow, if original submission doesn't work.

Review Process-1

- After manuscript submission, Editor/Associate Editor decides whether to review or not.
- If sent for reviewer, typically 2 or 3 reviewers will review. They are asked to submit review within 3 or 4 weeks (can take longer, however, if reviewer(s) not compliant)
- Reviewer will score the manuscript in different categories (significance, originality, quality of data, validity of conclusions, overall score). Submits comments to editors and separately, to authors. Reviewer should not recommend to authors whether manuscript is accepted/rejected, as this is editorial decision.

Review Process-2

- Editor considers all reviews and makes decision. Usually, this is relatively quick (24-96 hours)
- Decision has different flavors
 - Accept as such (Joy)
 - Accept with minor revisions (Joy)
 - Reject with opportunity to resubmit, but not guaranteed acceptance (Tears, then joy). This usually means additional experiments. Time limit on resubmission.
 - Reject (Tears). Appeal is usually not met with change of mind by Editor. Can take comments from reviewers and incorporate on resubmission to another journal.

My Manuscript Has Been Accepted!

- Once manuscript has been ultimately accepted, what happens? Deal directly with production staff.
- Proofs are sent. Corrections within 48-72 hours. Can recommend figure for cover.
- Most papers now on-line as soon proofs are in to journal. Actual paper will appear in 2-6 months, depending upon journal.

My Manuscript Has Been Declined!

- This never happens to me.
- It is the fault of my PI and/or my colleagues.
- The world is a strange, bitter place and I don't wish to participate in the human race anymore.
- Dear Editor: may the plague hit your family and friends!!
- Importantly, don't give up, persist and regroup
 - Plan what is needed--experimentally and practically--for next submission
 - What have I(we) learned for next time?

Grant Writing

Grant Writing

- Similarities with manuscript writing:
 - Novel idea(s)
 - Clear story
 - Convince reviewers
- Differences with manuscript writing:
 - Deadline with grants, which is motivational factor. Thus, deadline for manuscripts is important.

Grant Outline

- Title
- Abstract (summary)
- Specific Aims
- Background and Significance
- Preliminary Data
- Research Design and Methods
- Summary
- Timetable
- References
- Institutional Review Board (Human subjects)
- IACUC (Animal protocols)
- Letters of support

Specific Aims Page

- Typically 1/2-1 page
- Give brief background and significance, novelty of work and leading to hypothesis (state clearly)
- Hypothesis will be pursued by the following interrelated Specific Aims
 - Specific Aim 1: To determine...
 - Specific Aim 2: To understand
 - Can have subaims (1A, 1B, 2A, etc)
- Concluding sentence after specific Aims...This work will provide insights into the pathogenesis of cancer and lead to the development of new therapeutics.

Specific Aims (Continued)

- Concluding sentence after Specific Aims.....

“This work will provide insights into the pathogenesis of XX cancer and lead to the development of new therapeutics.”

Background and Significance

- Relevant literature review
- Start with broad aspects of a molecule or pathway or cellular process (can use Figures)
- Then, go into specifics. Can include your and lab's work.
- End with working model (Figure) for proposal

Preliminary Data

- Organize according to Specific Aims. In other words, present data directly per Aims
- Can present published data, but wouldn't repeat everything. Can include papers in appendix and refer to that
- Show most relevant preliminary data
- Can indicate "data not shown" as needed
- Make transition to next section: research design and methods

Research Design and Methods

- Organize again according to Specific Aims
- Under each Specific Aim, have 3 sections:
 - Rationale
 - Research Design & Methods (that is, technical aspects)
 - Anticipated results, potential pitfalls and alternative approaches (always try to include as it shows flexibility, which is important in biological experiments)

Other Sections-1

- Summary and future directions (1 paragraph)
- Timetable: over what period of time will each Specific Aim be accomplished? Can do as scheme/diagram
- References (25-50; more for NIH grants-- 75-100)

Other Sections-2

- Institutional Review Board (IRB) for human subjects. If using tissues (discarded or from tissue bank), this will usually have IRB approval already or obtain IRB exempt status.
- Institutional Animal Care and Use Committee (IACUC). Needed for animal studies if proposed
- The IRB, IACUC have to be specific for your proposal. In other words, titles of them need to match title of your grant proposal. Can obtain amendment to existing IRB, IACUC if close enough in theme.

Letters of Support

- Letters from collaborators. Investigators with key reagents or expertise
- Letters from institutional leadership

Grant Review Process-1

- Grant is usually assigned primary and secondary reviewers, who provide evaluations and scores. Usually, review committee abides by what the reviewers say.
- Private foundations: tend to provide reviews. Give “yes” or “no” answer. Resubmission is not possible, however, can submit again but would need to modify.
- Federal government organizations (NIH) provide detailed reviews. There is formal resubmission process, if needed

Grant Review Process-2

- NIH provides scores:
10-90
- Private foundations usually abide by this scale as well. May differ sometimes, but approach is the same.

Funding

- Usually decision is made by “Council” separate from review committee. Formalize what review committee recommended based upon scores.
- Private foundations (sources: private philanthropy, industry) and NIH (source: federal government) have annual budgets and make funding decisions based upon that.

Grants

- Very good exercise
- Honor to get
- Career building
- Use grants as platform