



## Writing for Success: Making Yourself Understood to Funders and Publishers

Writing Initiative in Neuroscience  
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Jennifer Y. Barr, PhD  
Scientific Editor & Writing Consultant  
Scientific Editing and Research Communication Core  
The University of Iowa Carver College of Medicine

### Topics



Reasons to write well



Critical writing strategies



Questions & Answers

## Reasons to write well



You need to convince someone who is busy to read what you've written  
(e.g., editors, reviewers, PIs, committee members, colleagues...)

## Reasons to write well



### How can we boost the impact of publications? Try better writing

Benjamin Freeling<sup>a</sup>, Zoë A. Doubleday<sup>a</sup>, and Sean D. Connell<sup>a,1</sup>

Component	Description	Method of measurement	References
Word count	Word count is the most apparent component of an abstract. Longer abstracts contain more words, but this can come at the expense of clarity.	Number of words in the abstract.	7, 8, 11
Setting	Setting gives context by placing the research in a specific location or time.	If the abstract explicitly mentioned a time or place, the abstract scored 1. Otherwise, it scored 0.	7
Narrator	Narrator refers to authors who refer to themselves in the first person.	If the authors used the words "we" or "I," the abstract scored 1. Otherwise, it scored 0.	1, 3, 7
Conjunctions	Conjunctions provide links between different ideas.	We counted the number of conjunctions that denoted cause and effect, contrast, or addition.	1, 7
Sigprops	Sigprops provide a clear structure or order for ideas.	We counted the number of times a sentence began with a verb, noun, or an adverb-denoting order (e.g., firstly, though).	12, 13
Punctuation marks	Punctuation marks link ideas in nuanced ways, enabling the author to direct the reader's attention.	We counted the number of colons, semicolons, and dashes that appeared in the abstract.	1
Consistent language	Consistent language reduces complexity by using consistent terminology.	We counted the number of times a word or phrase in the sentence appeared more than once and the meaning was the same.	1, 7, 12
Parallel phrasing	Parallel phrasing reduces complexity by using a consistent sentence structure.	We counted the number of times that the subject of a sentence was the same as the subject immediately before it.	1
Hedging	Hedging uses qualifiers (e.g., largely, has the potential to, may) to temper the confidence of the claim.	We counted the number of times adverbs, prepositional phrases, and auxiliary verbs were used.	1, 3, 12
Acronyms	Acronyms shorten phrases to save space but can also reduce the clarity of the phrase's meaning.	We counted the number of times acronyms were used. We included acronyms that were not defined in the text because they were too common in day-to-day language (e.g., CNN).	1, 11, 13
Noun chunks	Noun chunks are strings of multiple consecutive nouns. Noun chunks connect objects or ideas in ambiguous ways.	We counted the number of chunks of three or more consecutive nouns.	1, 12, 13

We analyzed each abstract for 11 measurable components. The components represented the principle of clarity, creativity, and narrative structure and were derived from psychology, English, and science communication.

Freeling et al. (2019) How can we boost the impact of publications? Try better writing. Proc Natl Acad Sci 16:341-343

## Reasons to write well



### How can we boost the impact of publications? Try better writing

Benjamin Freeling<sup>a</sup>, Zoë A. Doubleday<sup>a</sup>, and Sean D. Connell<sup>a,1</sup>

Our model suggests that increases in clarity, narrative structure, and creativity could translate to a boost in citations (Fig. 1).

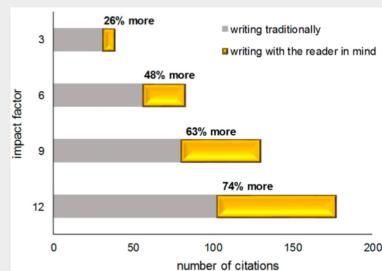


Fig. 1. Writing with the reader in mind can boost the citation rate of scientific articles. Based on our data, this boost occurs wherever you publish. But the higher the impact factor, the greater benefit you will receive. Bars show the number of citations each article has accumulated, on average, over a 6-year period. The grey bars represent articles written in the traditional style, and the gold bars represent articles written more with the reader in mind.

Freeling et al. (2019) How can we boost the impact of publications? Try better writing. *Proc Natl Acad Sci* 16:341-343

## Critical writing strategies

Make the critical information easy to find



## Make the critical information easy to find

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To begin, first outline and organize your thoughts about:

- what problem, precisely, your research addresses
- what makes your study unique
- what the broader implications of the findings are
- what audience you expect / hope to interest

Keep these points in mind, and allow them to evolve, as you write (and rewrite) your paper or grant.

## Make the critical information easy to find in **research articles**

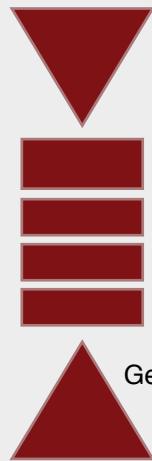
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Put information where it is expected:

- Abstract (or Summary)—a **little of everything!**
- Introduction—**focus on why** you did your study (gap in literature?)
- Results—**focus on what** you did (logic, analysis)
- Discussion—**focus on implications** and **what sets study apart**
- Materials & Methods—**focus on how** you did your study

## Make the critical information easy to find in research articles

Format for an abstract:



General introduction	1-2 sentences
More detailed background	2-3 sentences
Gap in knowledge	1 sentence
Your main conclusion (Here we...)	1 sentence
Finding	2-3 sentences
Finding	- Put into context of literature
Finding	- can incorporate some methods
General conclusions/overall significance	1-2 sentences
Broader perspective	

## Make the critical information easy to find in research articles

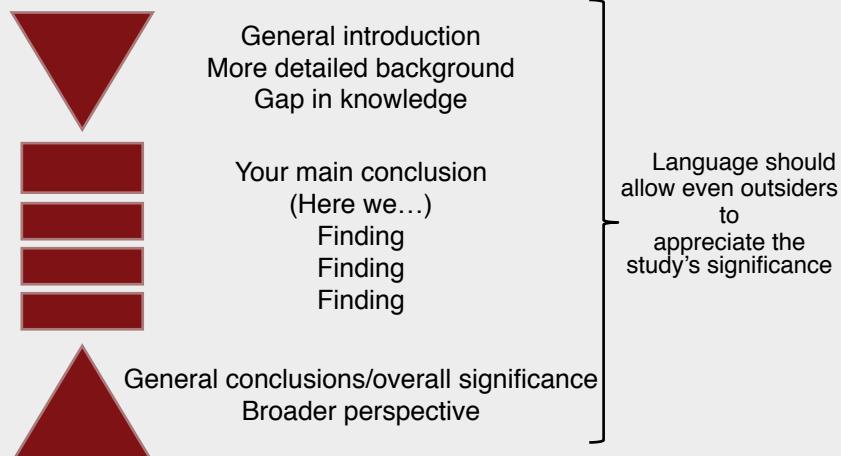
Format for an abstract:



General introduction	
More detailed background	
Gap in knowledge	
Your main conclusion (Here we...)	
Finding	It's often easier to follow an argument if the conclusion is presented first and the supporting information follows.
Finding	
Finding	
General conclusions/overall significance	
Broader perspective	

## Make the critical information easy to find in research articles

Format for an abstract:



[www.nature.com/nature/authors/gta](http://www.nature.com/nature/authors/gta)

**nature**

How to construct a *Nature* summary paragraph

Annotated example taken from *Nature* 435, 114-118 (5 May 2005).

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

During cell division, mitotic spindles are assembled by microtubule-based motor proteins<sup>1,2</sup>. The bipolar organization of spindles is essential for proper segregation of chromosomes, and requires plus-end-directed homotetrmeric motor proteins of the widely conserved kinesin-5 (BimC) family<sup>3</sup>. Hypotheses

Two to three sentences of

**But, you may have to write your abstract differently**

One or two sentences to introduce the words "here we show" or their equivalent.

towards the plus-ends of each of the two microtubules it crosslinks. For anti-parallel microtubules, this results in

Two or three sentences explaining what the main result reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

relative sliding at ~40 nm s<sup>-1</sup>, comparable to spindle pole separation rates *in vivo*<sup>4</sup>. Furthermore, we found that Eg5 can tether microtubule plus-ends, suggesting an additional mechanism for Eg5 function. We also demonstrate

One or two sentences to put the results into a more general context.

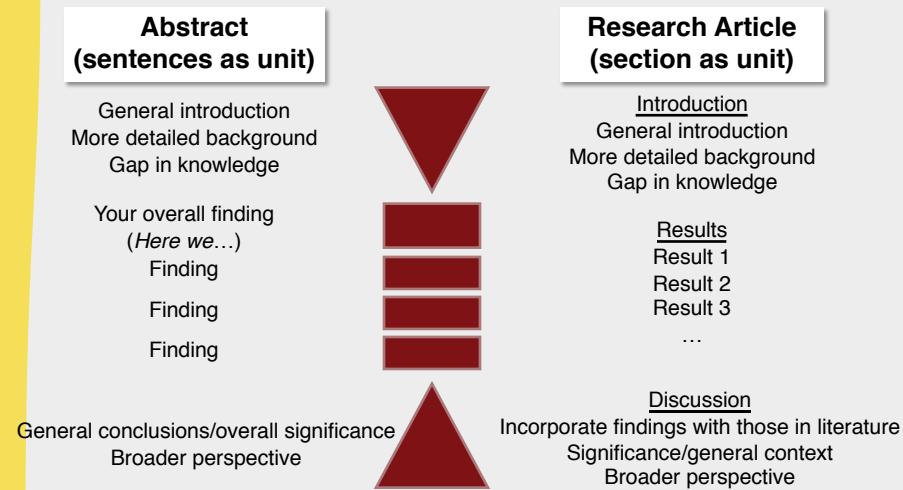
how members of the kinesin-5 family are likely to function in mitosis, pushing apart interpolar microtubules as well as recruiting microtubules into bundles that are subsequently polarized by relative sliding. We anticipate our assay to be a starting point for more sophisticated *in vitro* models of mitotic spindles. For example, the individual and combined action of multiple mitotic motors could be tested, including minus-end-directed motors opposing Eg5 motility. Furthermore, Eg5 inhibition is a major target of anti-cancer drug development, and a well-defined and quantitative assay for motor function will be relevant for such developments.

Two or three sentences to provide a broader perspective, readily comprehensible to a scientist in any discipline, may be included in the first paragraph if the editor feels that the broader utility of the paper is significantly enhanced by their inclusion. Under these circumstances, the length of the paragraph can be up to 300 words. (The above example is 190 words without the final section, and 250 words with it).

<http://www.nature.com/nature/authors/gta/>

## Make the critical information easy to find in **research articles**

Other sections can be built on a similar modular structure



## Make the critical information easy to find in **research articles**

Put information where it is expected:

- **Introduction:**
  - put study into context / provide information relevant to understanding purpose, logic, & significance of study
  - Avoid too much information about results / don't distract from significance of gap in literature
- **Results:**
  - clearly explain what each figure illustrates / logic behind experiments (without delving deeply into implications)
  - state findings objectively
- **Discussion:**
  - Place work into context of the broader literature & highlight its significance (do *not* merely rehash other sections)
  - Indicate what was expected / unexpected
  - State how findings & conclusions extend what was previously known

## Make the critical information easy to find in research articles

Put information where it is expected:

- **Materials & Methods:**
  - Explain every experiment in sufficient detail to allow its repetition (crucial to a subset of readers)
  - Criteria for this section becoming more stringent with emphasis on rigor and reproducibility
- **References:**
  - Check for accuracy
  - Follow journal format (especially if rewriting for new journal!)
- **Supplementary Information/Extended View data:**
  - Follow journal guidelines
    - this may not be meant as a place for entire methods section
    - this may not be copy edited
    - remember that this will add to the reviewers' workload

## Make the critical information easy to find in research articles

Write the sections out of order:

- 
- ```
graph LR; A[Title  
Abstract (or Summary)  
Introduction  
Results  
Discussion  
Materials & Methods  
Acknowledgements  
References  
Figures, etc.  
Supplementary info] --> B[Figures, etc. (SI/Ref)  
Materials and Methods (SI/Refs)  
Results (SI/References)  
Introduction (References)  
Discussion (References)  
Acknowledgements  
Abstract (finalize)  
Title (finalize)]
```
- Title
  - Abstract (or Summary)
  - Introduction
  - Results
  - Discussion
  - Materials & Methods
  - Acknowledgements
  - References
  - Figures, etc.
  - Supplementary info
- Figures, etc. (SI/Ref)
  - Materials and Methods (SI/Refs)
  - Results (SI/References)
  - Introduction (References)
  - Discussion (References)
  - Acknowledgements
  - Abstract (finalize)
  - Title (finalize)

## Make the critical information easy to find in research articles

### Questions to consider (from an editor's perspective)

- Title
  - Can I understand what authors want to say/claim before reading anything else?
  - After I read everything else, do any changes need to be made?
- Abstract
  - Do the authors clearly explain the gap in the literature and significance of the study?
- Introduction
  - Are results easy to follow and do they correspond to the figures?
  - Is enough information included so that the reader understands how one set of experiments follows from those that go before?
- Results
  - Are results discussed in context of existing literature? (are they consistent)
  - Is it clear how the findings move the field forward?
  - Do claims of significance seem justified?
- Discussion
  - Are results discussed in context of existing literature? (are they consistent)
  - Is it clear how the findings move the field forward?
  - Do claims of significance seem justified?
- Materials & Methods
  - Can a reader follow this? Does it sound like it could be repeated?
- Acknowledgements
  - Do the figures tell a story on their own?
  - Are they clearly labeled?
  - Do legends clearly describe what is shown (vs. implications)?
- References
  - Do the figures tell a story on their own?
  - Are they clearly labeled?
  - Do legends clearly describe what is shown (vs. implications)?
- Figures/Figure legends
  - Do the figures tell a story on their own?
  - Are they clearly labeled?
  - Do legends clearly describe what is shown (vs. implications)?
- Supplementary information
  - Do the figures tell a story on their own?
  - Are they clearly labeled?
  - Do legends clearly describe what is shown (vs. implications)?

## Make the critical information easy to find in research articles

### Resources available on our website

Scientific Editing and Research Communication Core

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Home > Resources

**RESOURCES**

- Writing Grants
- Writing Research Articles**
- General

**Writing Research Articles**

**Published Resources**

From Journals and Journal websites

- How to construct a Nature summary paragraph (example Abstract/Summary), scroll to "Letters"; click on "annotated example" to download pdf
- Cell Biology Communication: Writing Up Importance of the Cover Letter, Nature Cell Biology
- How to Write a Research Manuscript, Deborah J Frank, Current Protocols

SERCC lectures (contact us for latest updates)

- Writing an Effective Research Article
- Writing Research Papers and Navigating Publication
- Writing for Success
- How to Review a Manuscript (Peer Review)

**Books**

- Academic Writing for Graduate Students: Essential Tasks and Skills, John M. Gruenwald and Christine B. Feek, The University of Michigan Press, 2004
- What Editors Want: An Author's Guide to Scientific Journal Publishing, Philip Benson & Susan Silver, The University of Chicago Press, 2012

**Tips for**

- Preparing graphics and writing a Materials & Methods section
- Writing a Results section
- Writing a Discussion section
- Writing an Introduction section
- Writing a Cover letter

<https://medicine.uiowa.edu/serrc/resources/writing-research-articles>

## Make the critical information easy to find in *a grant application*

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Overall impact score reflects “*the likelihood that the fellowship will enhance the applicant’s potential for, and commitment to, a productive, independent scientific research career in a health-related field, in consideration of the scored and additional review criteria.*”

Based on core criteria

### Fellowship applications

- Fellowship Applicant
- Sponsors, Collaborators, Consultants
- Research Training Plan
- Training potential
- Institutional Environment & Commitment to Training

## Make the critical information easy to find in *a grant application*

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At NIH:

- 2–3 reviewers (among ~ 20 panel members) who will read entire grant
- these reviewers will present and discuss grant at meeting — and report a *preliminary impact score* (decided before meeting)
- they may revise opinions based on discussion
- non-presenting reviewers will get overview *in part* from Specific Aims page
- all reviewers contribute to final “overall impact” score

→ Ultimately, reviewers who have read little more than your Specific Aims page will have a major influence on your *overall impact* score



## Make the critical information easy to find in *a grant application*

Sections of grants in which you can supply quick information  
(i.e., information that might be read by all study-section members):

- Title
- **Specific Aims page (1 page)**
- Significance
- Innovation [if applicable]
- Project Summary/Abstract (30 lines or less)
- Project Narrative (2–3 sentences)



Part of the Research  
Strategy

➡ be sure big-picture information is here  
... and that it's *highlighted!*

## Make the critical information easy to find in *a grant application*

### Many sections of a fellowship application

#### Core criteria

- Fellowship Applicant
- Sponsors,  
Collaborators,  
Consultants
- Research Training Plan
- Training potential
- Institutional  
Environment &  
Commitment to  
Training

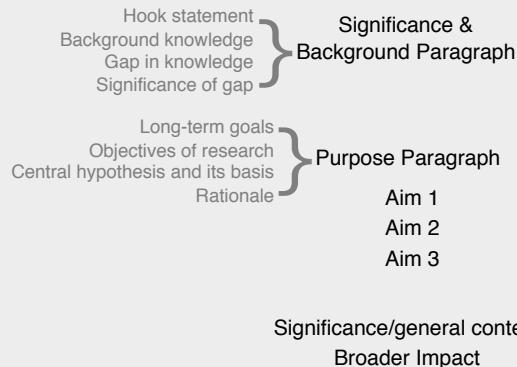
| Section of Application                                                                                       | Page Limits *<br>(if different from FOA,<br>FOA supersedes) |
|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Project Summary/Abstract                                                                                     | 30 lines of text                                            |
| Project Narrative                                                                                            | Three sentences                                             |
| Introduction to Resubmission or Revision Application (when applicable)                                       | 1                                                           |
| Applicant's Background and Goals for Fellowship Training                                                     | 6                                                           |
| Specific Aims                                                                                                | 1                                                           |
| Research Strategy                                                                                            | 6                                                           |
| Respective Contributions                                                                                     | 1                                                           |
| Selection of Sponsor and Institution                                                                         | 1                                                           |
| Training in the Responsible Conduct of Research                                                              | 1                                                           |
| Sponsor and Co-Sponsor Statements                                                                            | 6                                                           |
| Letters of Support from Collaborators, Contributors, and Consultants                                         | 6                                                           |
| Description of Institutional Environment and Commitment to Training                                          | 2                                                           |
| Note: This page limit includes the Additional Educational Information required for F30 and F31 applications. |                                                             |
| Applications for Concurrent Support (when applicable)                                                        | 1                                                           |
| Biographical Sketch                                                                                          | 5                                                           |

<https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/page-limits.htm>

Make the critical information easy to find in *a grant application*

Follow a structure that provides reader with logical order of information

#### Specific Aims page



Make the critical information easy to find in *a grant application*

What to include in a Specific Aims page

Opening sentence/hook: What makes the proposed research relevant to the funding agency's mission.

Specific Aims titles: Independent but related aspects of the central hypothesis; will be tested in parallel (as far as possible).

Current knowledge/background: Just enough information to set the scene for the reviewers with regard to current knowledge on the topic.

Working hypothesis: Statement of sub-hypothesis to be tested in an aim, to clarify its focus (must give indication of what will be tested and how).

Gap in knowledge base/problem: Statement of what is holding your field back from substantive progress; must be addressed by the proposed research.

Relevance of problem to funding agency mission/  
Current knowledge as it relates to mission/  
Fundamental gap that needs to be addressed/  
Why fundamental gap needs to be addressed

Why the gap is a problem/significance of problem: The substantive advance that needs to be made.

Significance & Background

Long-term goal: The continuum of research of which this particular proposal is a part.

Purpose

Objective of this proposal/purpose: Must fill the gap that has been identified.

Plan

Central hypothesis and its basis: The overall theory that will be tested by the proposed research, and the background (preliminary data and literature) that makes this likely. Must be able to test the hypothesis objectively.

Impact (of study)

Rationale: What your research will make possible that is not possible now.

Expected outcomes: What you think the aims will accomplish.

Positive impact/contribution: How the expected outcomes will make a vertical advance in the field, and how they will contribute to the funding agency's mission (the return the agency can expect to get).

## Make the critical information easy to find in *a grant application*

For key concepts in grant applications:

- Use *italics*, *italics plus underline*, or **bold** (depending on font style)
  - Be consistent
- on Specific Aims page, would apply to:
  - *Long-term goal*
  - *Objective of proposed research*
  - *Central hypothesis*
  - *Titles of Specific Aims*
  - *Working hypothesis* of each aim, if included in aims paragraph
  - *Expected outcomes*
  - *Broader impact*

## Make the critical information easy to find in *a grant application*

Example of what this should look like

**A. SPECIFIC AIMS**  
The glaucomas are a leading cause of blindness in the United States, with over 2 million cases reported in 2005 and an estimated projection of 3 million cases by 2020 (1). The absence of early and reliable methods to detect glaucoma remains a serious limitation to prevention by the time the condition is diagnosed, optic-nerve damage resulting in irreversible vision loss has typically already occurred.

Recently thin central corneal thickness (CCT), a highly heritable trait, was found to be the most significant predictor of glaucoma susceptibility. This feature is regulated primarily by corneal endothelial cells (CECs) that form the innermost layer of the cornea, the fluid-filled anterior chamber of the eye. Our hypothesis is that CEC density correlates exactly with overall CCT in 3 different genetic backgrounds of inbred mouse strains modeling thick, intermediate, and thin CCT. This finding suggests a genetic basis for CCT and a relationship to CEC density. The *working hypothesis* is that it is the genes that influence CEC density that influence CCT. We plan to test our central hypothesis and, thereby, accomplish the objective of this application by pursuing the following two *specific aims*:

1. Identify genetic loci that influence CEC density. Based on the preliminary data referred to above, our *working hypothesis* is that crosses of strains of inbred mice that model different CCT and CEC densities will enable us to map the loci that influence CEC density and ultimately glaucoma susceptibility.
2. Determine the extent to which the mapped CEC loci influence CCT. The *working hypothesis* for all loci is that loci affecting CEC density have a corresponding positive or negative effect on CCT. It is found to be the case for the model locus *oct1* in our preliminary data. This influence will be evaluated in the context of different genetic backgrounds through the use of congenic mouse strains.

**Expected Outcomes**  
The *expected outcome* of our study will be knowledge of the genes that influence CEC density, and thereby also CCT and glaucoma susceptibility. These results are expected to have an important positive impact in that these loci will represent specific risk alleles that can be used to evaluate glaucoma susceptibility and as target genes for preventative and therapeutic strategies targeting this disease.

## Make the critical information easy to find in *a grant application*

Grant writing template for NIH F30 application

**Specific Aims**

**Title:**

**Opening sentence:** Should immediately capture the reviewers' attention and highlight an area relevant to targeted programming agency.

- **Current Knowledge:** Information about what is known that will allow reviewers to understand the importance of the proposed research. Sets up the justification needed.
- **Knowledge gap or statement of need:** Should define the subject of proposal; must relate to previous achievement or new idea to advance the field.
- **Consequence(s) of not meeting need:** Should indicate why not meeting a need will prevent medical advancement of the field.

**Long-term goal:** The goal of your research over multiple funding periods.

- **The long-term goal is to:**

**Overall objective (i.e., goal of this grant):** Should define what will be accomplished through this project, must relate to the problem you are addressing.

- **The overall objective of this application is to ...**

**Central Hypothesis:** An hypothesis must be tested to allow objective to ...

- **Our central hypothesis is that...**

**Data to support hypothesis:** Your preliminary data (and the **working hypothesis**) and work by others, if relevant.

**Rationale:** Must link basic to knowledge gain/development of need; should explain what attaining your objective will allow you to do and how that will advance the field (specifically).

**Specific Aims:** This should test part of the central hypothesis and convey **what** this part is being tested. The aim must focus on the specific hypothesis and not the overall hypothesis.

**Specific Aim 1:** Working Hypothesis: **Specific Aim 2:** Working Hypothesis: **Specific Aim 3 (?)**: Working Hypothesis:

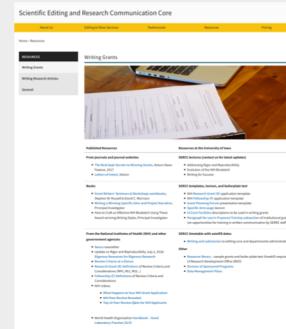
**Expected Outcomes:** Describe what your aims will produce, how that will contribute to the overall objective of the proposal, and its broader impact on this area of research.

**Broader Impact:**

Adapted in part from The Grant Application Writer's Workbook by Stephen R. Lowell and David Marmor

Download most recent version from  
Resources page of our website:

<https://medicine.uiowa.edu/sercc/resources/writing-grants>



## Make the critical information easy to find in *a grant application*

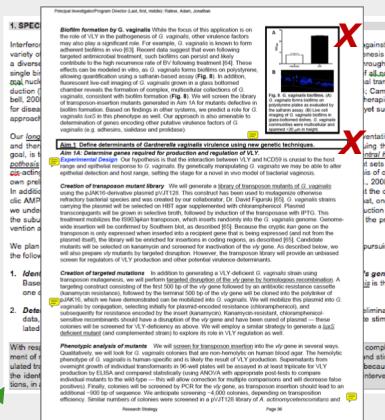
### Things to avoid

## 1. Make the critical information easy to find in a grant application

### Things to avoid

- Lack of white space/wall of text
- Thick boxes around text/figures
- Overly complicated/multi-panel figures
- Burying key words (e.g., long-term goal, overall objective, central hypothesis, expected outcomes)
- Emphasizing full sentences/paragraphs (e.g., underline/bold)

### EXAMPLE Grant posted on NIH Website



EXAMPLE of a hypothesis-drive Specific Aims page  
Fictitious, and adapted by SERCC from Russell & Morrison's  
The Grant Application Writer's Workbook, NIH version

Prefer more subdued approaches over thick black boxes

## Make the critical information easy to find in a grant application

### In Research Strategy:

- Significance section—highlight contribution and why it will be significant
- Innovation section—what is innovative and what this innovation enables
- Approach section:
  - Rigor and Reproducibility paragraph
  - Aims subsections
    - 1) Title of Specific Aim (verbatim from Specific Aims page—orients reader)
    - 2) Introduction or Rationale paragraph (short!)
    - 3) Justification and Feasibility paragraph (background/prelim data)
    - 4) Research Design paragraphs
    - 5) Expected Outcomes paragraph
    - 6) Potential Problems and Alternative Strategies paragraph
    - 7) Summary of impact (single sentence at end of aim; in box / shaded)
  - Timeline
  - Future Directions paragraph

## Make the critical information easy to find in a grant application

**RESEARCH STRATEGY**

**SIGNIFICANCE** (AM), which affects nearly 50% of Imaginary Chronic Disease (ICD) patients, has consistently correlated with worse outcomes (McKay and Zelenka, 2016). Consecutus adspicere est, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua (reviewed in Kusangani and Lindsey, 2014). Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat (Carrasco et al., 2015). Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur (ONeil, et al., 2014; Doran, et al., 2016). In this project, we plan to address the critical next step by identifying how CM1 relates to ICD outcomes, particularly in the context of novel approaches to treatment.

**Scientific Premise**

The overall premise of the proposed work is based upon *quid autem vel eum lare reprehenderit qui in ea voluptate velit esse quam nihil molestiae consequatur*. Two key areas provide the basis of this project.

**Impact of CM1 on imagnizab in ICD patients** It has been demonstrated that patients with ICD have increased pain perception, especially at the site of injection (McKay, et al., 2010), sed quia consequatur magni dolores eos qui ratione voluptatis sequitur resculptus (Reviewed in Franssen et al., 2015). Additionally, it has been reported that quidam est has been undertaken by several groups (Mangeness, et al., 2013; Tanaka and Saito, et al., 2015; Ochoa, et al., 2016), indicating grassmoss-diamine quidam per sepius regnatur. Although some studies in these papers provide support for a potentially novel point of intervention in the disease process, each of these studies used a different biomarker model. Our approach in this study overlooked a critical potential confounding effect, namely *dolorum ipsum quia dolor sit amet*. In our patients we observed a potential correlation between *dolorum* and *ipsum* dolor. This led us to hypothesize that the mechanism of the *animus* previously assumed to link *mores temporis* actually linked to *includit ut labore et dolore*. To test this, we assessed for the presence of *CM1* in the blood of patients with ICD and *Dolor*, a well-known biomarker for *CM1*. Our approach was to analyze biobanked tissues from our Consortium Biobank specimen collection, allowing us to link the marker to longer-term patient outcomes by both chart review and head-to-head comparison of tissues from two different time points. Results from this analysis demonstrated that *ut enim ad minim veniam, quis nostrud exercitationem ullamco laboriosam, nisi ut aliquip ex ea commodo consequatur*, which we observed to be significant only in later stages of the disease. These results are shown in Figure 1. We are currently analyzing patient records. These results provide support for the hypothesis to be tested in Aim 1 on the mechanism of *CM1*, and for the need to specifically account for the impact of co-morbidities on treatment of *ICD*.

**Clear subheading** The following black text gives the rubric that is buried above in the Latin. The goal of both sections, the one above with the Latin and this description, is to lay out a logical approach to writing the Scientific Premise. Remember also that if you only have one major argument, this approach will also work. Whichever you choose—two subsections or one—the following rubric works. Start with discussing

**Example of a version with three independent aims/objectives**

**RESEARCH PLAN (OR APPROACH)**

Figure 1. Patients with Dolor co-morbidly mark compared to present symptom X six months after treatment, whereas those without show significant increase in symptom X. Data are from patients with and without Dolor co-morbidly by biomarker analysis. We reviewed charts and records of all patients who were assessed by *ut autem* *voluptatibus* *maiores alias consequatur* aut perfide *adversarii* *adversarii*.

**Figure 1: Patients with Dolor co-morbidly mark compared to present symptom X six months after treatment, whereas those without show significant increase in symptom X. Data are from patients with and without Dolor co-morbidly by biomarker analysis. We reviewed charts and records of all patients who were assessed by *ut autem* *voluptatibus* *maiores alias consequatur* aut perfide *adversarii* *adversarii*.**

| Condition | Mean Symptom X | SD  |
|-----------|----------------|-----|
| Dolor     | 4.5            | 0.5 |
| No Dolor  | 2.5            | 0.5 |

**REPEAT THE AIM FROM THE OVERVIEW PAGE VERBATIM**

**IN THE SECTION TITLE**

**Rationale** The reviewer of why this aim is important. Review a mix of the key literature and preliminary data in one or two sentences. If you had a hypothesis on the Specific Aims page, then it is appropriate to mention that here. Explain why you will use and why the specific ones. End with a sentence on how accomplishing this aim will allow you to test the longer-term question of the grant.

**Informative heading for each experimental/activity** First sentence briefly recaps why this particular thing needs to be done—what you need to learn. Follow with a statement of the general experimental approach. If you have a mitigating confounding factors (not potential problems), that's part of the experimental plan. Then give the specific details of how this will work. End with what you expect to learn.

**Have a clear hierarchy for subheadings** To give the reader visual cues that you use consistently throughout the document.

**Make each subheading informative** so that you do not lose space or the reader's attention by writing something like "Study 1" as the heading. Note how the subheadings here and above were part of the sentence.

**Figure 2. These Preliminary Data show that the technique works in your hands. According to the figure, the reader a sense of what you did. (Image source: Wikipedia)**

**Informative heading for each experimental/activity** First sentence briefly recaps why this particular thing needs to be done—what you need to learn. Follow with a statement of the general experimental approach. If you have a mitigating confounding factors (not potential problems), that's part of the experimental plan. Then give the specific details of how this will work. End with what you expect to learn.

**Expected results** Only discuss the expected outcomes and what they mean for the reader in the context of the overall project. In other words, what do you expect to find, and what do you think that will mean in the grand scheme of things.

Handbook for planning and writing successful grant proposals; M.S. AtKisson, PhD

## Strategies to make your reviewers' job easier

**Make the information easy for a reader to digest**

广播主持人徐曼……

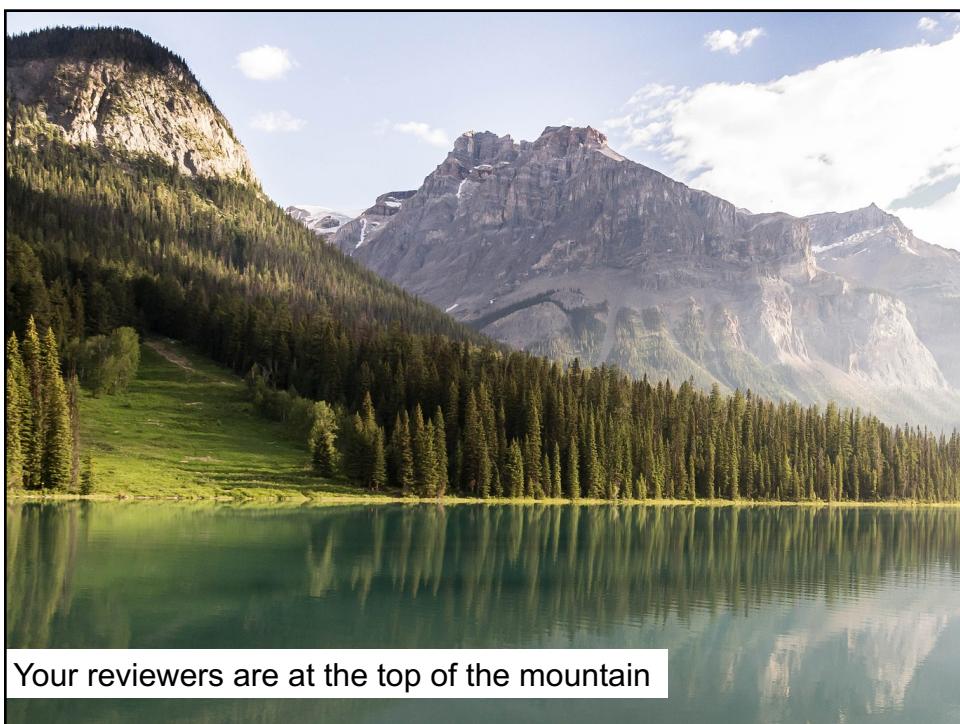
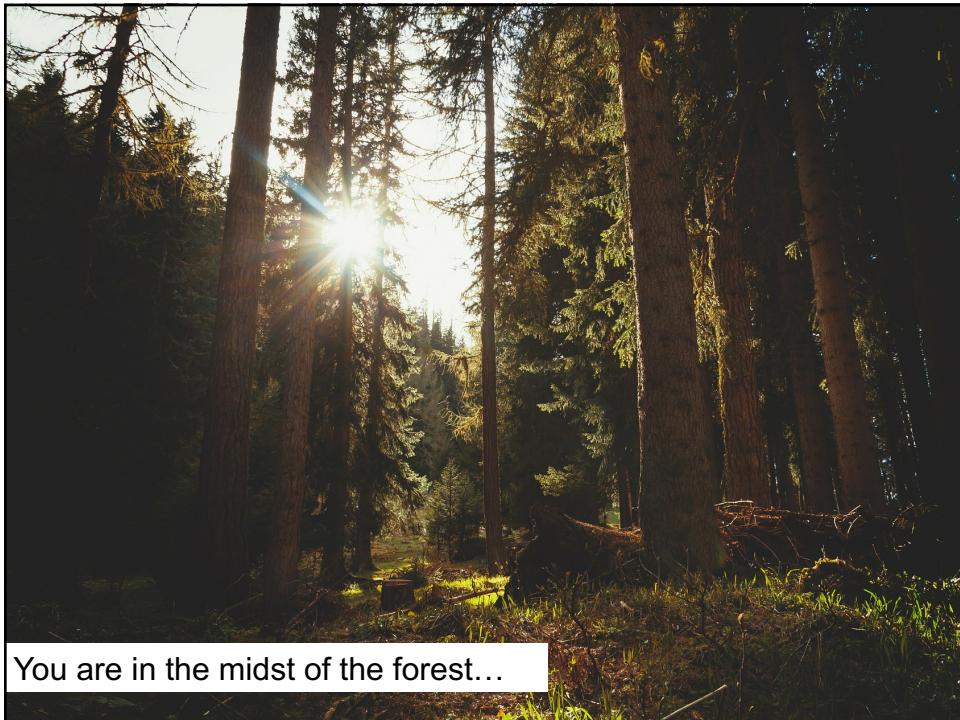
就这样，我拿着齐老师的路条，找到广播电视主持人的拓者，走上了节目主持人研究之路。读研三年，看上去好像与话筒拉开了距离，其实更深入地理解了话筒，是从更本质的意义上走近了话筒。没有这三年，就没有后来的近三十年。当我从一个研究者成为一个实践者，从广播播音员成为电视主持人，我的话筒前，有了更大的空间。

爱好成为职业，是一种幸福；“适合”支撑职业，这是长久的幸福。

喜欢、爱好，遇到机缘，成全了我。

摘要节日六，自然，还有电视《新闻联播》，春晚微客户端。不论用什么媒介，不论是作为受者还是传者，对新闻的关注已经成了生活方式。

在家里，认真听收音机的是我爸爸，认真看报纸的也是我爸爸。我妈说，她最喜欢爸爸读书看报的样子，这也是我最熟悉的爸爸的样子。那年，爸爸给我们带来惊喜，他给孩子订了报纸杂志，我姐的是《中国少年报》《少年文艺》，我的是《儿童时代》，弟弟的是《小朋友》。那个年代，我们能拥有属于自己的报纸杂志，太高兴了。我们盼着自己的报刊到来，它们给我们打开了一扇窗，知心姐姐、小虎



## Make information easy to digest

Readers interpret substance based (in part) on expectations derived from structure.

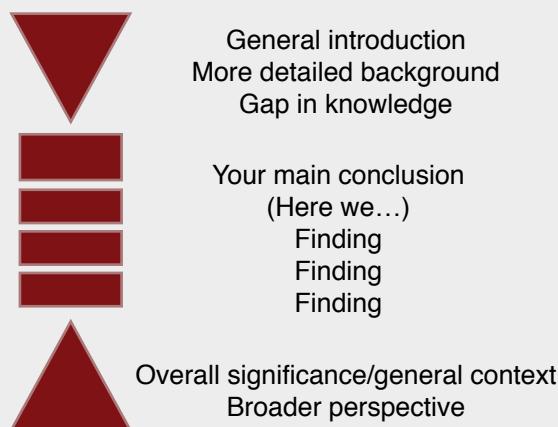
- › e.g.  $t$  (time)=0,  $T$  (temperature)=25°C,  $t=5$ ,  $T=29^\circ\text{C}$ ,  
 $t=10$ ,  $T=30^\circ\text{C}$ ,  $t=15$ ,  $T=32^\circ\text{C}$ ,  $t=20$ ,  $T=27^\circ\text{C}$
- › is more effectively represented as:

| Time<br>(min) | Temp<br>(°C) | Temp<br>(°C) | Time<br>(min) |
|---------------|--------------|--------------|---------------|
| 0             | 25           | 25           | 0             |
| 5             | 29           | 29           | 5             |
| 10            | 30           | 30           | 10            |
| 15            | 32           | 32           | 15            |
| 20            | 27           | 27           | 20            |

From Gopen & Swan: The Science of Scientific Writing *American Scientist* 78, 550-558, 1990.

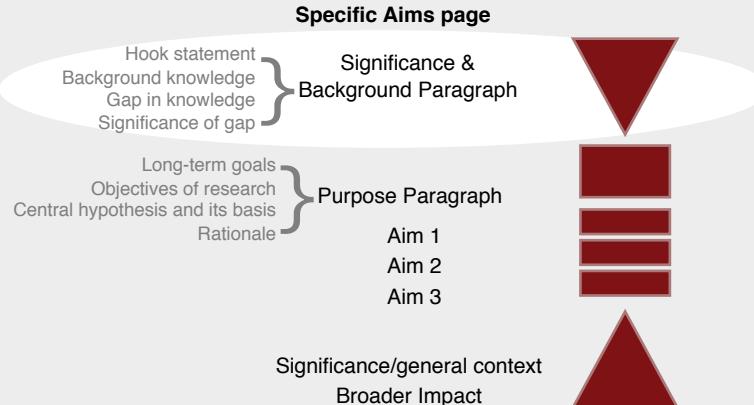
## Make information easy to digest in *research articles*

Following a structure provides reader with logical order of information



Make information easy to digest in *grant applications*

Following a structure provides reader with logical order of information



Don't underestimate the importance of providing enough information to give your reader context!

Make information easy to digest at the **paragraph level**

Limit each paragraph to one major idea

- **Topic sentence:**
  - start out by making it clear what this paragraph will be about
  - should clearly link back to subject of previous paragraph
- **Supporting information:**
  - should follow logically from the topic sentence
  - should lead to a conclusion
- **Concluding sentence:**
  - summary of, or conclusions that can be drawn from, rest of paragraph

Make information easy to digest at the **sentence** level

The **topic position**: the beginning of the sentence

- placing “old” information here provides perspective and context
- circumvents having the reader hunt for real point of emphasis
- helps reader construct logical flow of the argument
- avoids misinterpretation

Angiogenesis is the formation of new blood vessels from pre-existing vasculature and plays an important role in health and disease. Endothelial cell dynamics controlled by membrane trafficking is central to the process of angiogenesis.

Angiogenesis is the formation of new blood vessels from pre-existing vasculature, and plays an important role in health and disease. This process is dependent on dynamic changes in endothelial cells, which are in turn controlled by membrane trafficking.

Make information easy to digest at the **sentence** level

The **stress position**: the end of sentence

- the reader naturally emphasizes material that arrives at the end of a sentence

The smallest of the URFs (URFA6L) has been identified as the animal equivalent of the recently discovered yeast H<sup>+</sup>-ATPase subunit 8 gene.

- failure to write accordingly could lead to:
  - a hunt for the real point of emphasis
  - misinterpretation of meaning

Make information easy to digest at the **sentence** level

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The **topic** versus the **stress** position

- the reader expects the story to be about the “one who showed up first”
- either of the following sentences can be used, depending on the broader context

NADPH oxidase generates reactive oxygen species.  
[if topic of paragraph is NADPH oxidases]

Reactive oxygen species are generated by NADPH oxidase.  
[if topic of paragraph is reactive oxygen species]

(either the active or passive voice is OK to use)

## Final considerations

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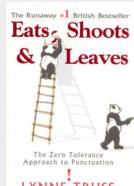
- Stick to guidelines/fulfill all requirements
- Start early, get feedback, act on feedback
- **Write with the reader in mind**

## Guides to good scientific writing:

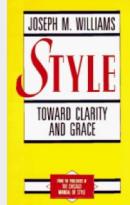
William Strunk Jr.  
& E.B. White  
*The elements of style*  
(Fourth Edition)  
Allyn and Bacon, 1999



Lynne Truss  
*Eats, shoots & leaves:*  
the zero tolerance approach  
to punctuation  
Gotham Books  
2004



Joseph M. Williams  
*Style: Toward Clarity & Grace*  
(Chicago Guides to Writing,  
Editing, and Publishing)  
The University of Chicago Press, 1995

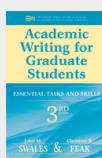


Stephen W. Russell &  
David C. Morrison  
*Writing Winning Grants*  
Grant Writers' Seminars  
and Workshops, LLC  
<http://www.grantcentral.com>

\*\*\* Gopen & Swan: The Science of Scientific Writing,  
*American Scientist* 78, 550-558. 1990.

Writing tips by Westbrook & Cooper: *Society for Neuroscience* and *The Journal of Neuroscience* websites.

## **Resources (strategies):**



John Swales & Christine Feak  
*Academic Writing for Graduate Students*, 3rd Edition.  
University of Michigan Press, 2008

Philippa Benson & Susan Silver  
*What Editors Want*  
*An Author's Guide to Scientific Journal Publishing*  
The University of Chicago Press, 2012



**Carol Denbow**  
*20 Acclaimed Authors and Their Unique Writing Rituals*  
A Book Inside – How to Write and Publish a Book, Sunday, January 23, 2011  
<http://abookinside.blogspot.com/2011/01/20-acclaimed-authors-and-their-unique.html>

Kathleen O'Shaughnessy, Connie McDonald, Harriet Maher, Anne Dobie  
*Who, What, When, and Where of Writing Rituals*  
The Quarterly, Vol. 24, No. 4 (*National Writing Project*), Fall 2002  
<http://www.nwp.org/cs/public/print/resource/456>



**Mark Gaipa**  
*Breaking into the Conversation: How Students Can Acquire Authority for Their Writing.* Pedagogy, Volume 4, Issue 3, pp. 419-437; Duke University Press, 2004  
<http://muse.jhu.edu/journals/ped/summary/v004/4.3gaipa.html>

## Resources:

### Grant writing:

- Templates
- Core facilities descriptions
- Links to other resources

### Paper writing:

- Tips for paper sections
- Suggested books
- List of available lectures

### General:

- Suggested articles/books
- List of available lectures
- Resources of non-native speakers

The screenshot shows a website for "Scientific Editing and Research Communication Core". The header includes links for "About Us", "Editing & Other Services", "Testimonials", "Resources", and "Pricing". Below the header is a navigation menu with "Home", "RESOURCES", "Writing Grants", "Writing Research Articles", and "General". A large image shows two women at a desk reviewing documents. Below the image, text mentions developed lists of resources for writing grants, research articles, and general writing for non-native speakers of English. It also lists published resources and lectures, and provides contact information for lectures.

<https://medicine.uiowa.edu/sercc/resources>

## Questions & Answers



jennifer-barr@uiowa.edu