

Enhancing Biomedical Sciences Grant Success through Scientific Editing



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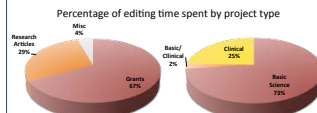
Abstract

Competition for research funding has become particularly intense in the last several years, at various institutes and centers of the National Institutes of Health (NIH), funding paylines are between the 9th and 14th percentiles. Additionally, data from the NIH indicate that a new R01 application unscored on first submission has, on average, a 2.3% chance of being funded on resubmission. In recognition of this situation, the Department of Obstetrics & Gynecology (Ob/Gyn) at Washington University in St. Louis created a Scientific Editor position modeled after a service at the University of Iowa Carver College of Medicine. At both institutions, the editors are scientists and qualified to comment on not only the language and presentation of a proposal, but also the underlying scientific logic. Indeed, many users have judged the editors' input as similar to that provided by mentors or reviewers. Feedback on these editorial services has identified significant improvements in clarity and logic, as well as crystallization of concepts, as outcomes key to the improved success of funding and publications. When the service at Washington University was established in 2012, the Ob/Gyn Department was ranked 20th in NIH funding among its US peers; in 2014, it was 4th. At the University of Iowa, the rankings of the host departments over the past decade have shifted from 47th to 26th in one case and from 36th to 22nd in the other. Users at both sites have credited the editing service with their successes. We will present advice for establishing a successful scientific editing office, before-and-after examples of edited text, examples of reviewer comments and author testimonials, estimates of workload, and data from surveys of researchers. We hope that such information will be useful to research development professionals interested in developing similar services at their home institutions.

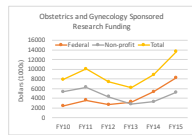
Two such scientific editing services

Washington University in St. Louis

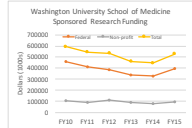
- Usage in 2015:
- Served 22 faculty members/laboratories
 - Edited 57 grants
 - Edited 28 manuscripts



Research funding increased after editing service started



Start of editing service



Users have been funded by:



Submission	NIH Grant Type	Principal Investigator	Percentile Score
First	R21 (exploratory)	Full prof.	12th
	R01 (research project)	Asst. prof.	12th
	F31 (predoctoral fellowship)	PHD student	12th
	R01	Asst. prof.	7th
Resubmission	R01	Full prof.	4th
	R01	Full prof.	3rd
	R01	Full prof.	7th
	R01	Asst. prof.	7th
	R01	Full prof.	5th
U01 (cooperative agreement)	Assoc. & Asst. profs.	2nd	

Currently, only grants scored in top 9th to 15th percentiles (depending on Institute or Center at NIH) are funded



Selected comments from grant reviewers

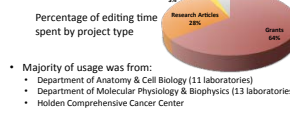
- Reviewer 1:** This beautifully written proposal... This reviewer appreciates the thought and care that went into organizing and writing this proposal.
- Reviewer 2:** The strengths of the proposal are many: it is extremely mechanistic and well-written... Excellent grantmanship.
- Reviewer:** the proposal... exhibits exceptional grantmanship. The proposal was a pleasure to read.
- Reviewer 1:** It is coherent and well written...
- Reviewer 2:** The proposal is well written...
- Reviewer 3:** This is a very well written proposal.

Selected comments from editing service users

- The most compelling reason for hiring a Scientific Editor with a doctorate in biological sciences and postdoctoral training is to have an expert, critical reviewer who's on your side... I can personally attest to the sea change in my own grantmanship... I get my grants done much in advance to make sure she gets time to review.
- Indira Mysorekar, PhD (recently tenured professor)
- The services of a good scientific [editor] are invaluable to a busy clinician who is also trying to do research and write grants/papers. I have been at institutions where this service is not available and papers/grants seemed to take much longer to finalize for submission.
- Jerry Lowder, MD (professor)

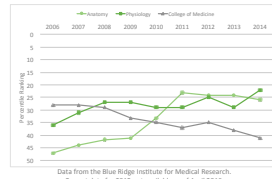
University of Iowa

- Usage in 2015:
- Served 37 units (laboratories, centers, programs)
 - Edited 73 grants
 - Edited 34 manuscripts



- Majority of usage was from:
 - Department of Anatomy & Cell Biology (11 laboratories)
 - Department of Molecular Physiology & Biophysics (13 laboratories)
 - Hidden Comprehensive Cancer Center
- Teaching benefited:
 - Departments of Anatomy & Cell Biology and Molecular Physiology & Biophysics, Colleges of Medicine and Dentistry
 - Topics included scientific writing, paper writing, grant writing, NIH Biosketch

National percentile rankings of sponsoring departments improved after service was established in 2006



Users have been funded by:



Particularly successful NIH Submissions	Principal Investigator	Percentile Score
F31 (predoctoral fellowship)	PHD student	Perfect (10)
R21 (exploratory)	Assoc. prof.	5th
R01 (research project)	Assist. prof.	4th (PI's first R01 subm)
R01	Assoc. prof.	6th
R01	Assoc. prof.	6th
R01	Assoc. prof.	6th
R01	Assoc. prof.	7th
R01	Assoc. prof.	7th
R01	Full prof.	9th
P01 (program project)	Full prof.	Perfect
P01 component	Full prof.	Perfect
USA (cooperative agreement)	Full profs.	Perfect



Selected comments from journal editor and users

- Editor:** Your [1st] manuscript has been accepted and was actually noted as one of the best written and organized submissions from an author, so I would absolutely love to have more submissions from your group.
- Charles Harata, MD, PhD (Associate Professor)
- One of the reviewers of a grant that you edited said this "This is a beautifully constructed and exceptionally well written grant". I give you immense credit for shaping my style of grant writing, not to mention smoothing countless sentences and paragraphs of this and every other recent submission.
- Robert Cornell, PhD (Professor)
- By you attempting to make sense of what we were trying to say, the concept itself got clearer. What was once an amorphous thought was now crystallized into a solid concrete idea.
- Robert Piper, PhD (Professor)
- While my previous grants have been criticized for being too dense, the ones you helped edit were praised for their clarity. As a current member of a study section, I can definitely say this provides a major advantage.
- Amy Lee, PhD (Professor)
- From your work, I learned not only English writing, but also, scientific logical flow, which will definitely help me to be a better writer.
- Hank Qi, PhD (Assistant Professor)

Example output

R01 Aims page

Before editing | After editing

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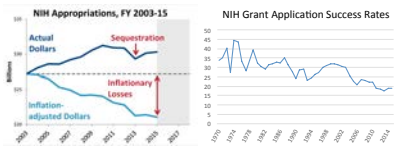
Comments to improve figures

Editing Considerations:

- Clarify ambiguous text
- Improve logic and flow by rearranging aims/paragraphs/sentences/figures
- Make sure key points – especially those related to overall significance and impact – are easy to find
- Comment on reasoning for changes (see left)
- Identify scientific weaknesses that might concern a reviewer
- Suggest experiments to address scientific weaknesses
- Ensure "fit" with funding agency goals
- Ensure adherence to guidelines
- Correct grammatical mistakes and inconsistencies in wording, formatting

Why establish an editing service?

1. Fierce competition for limited research funds



2. "Publish or perish"

Activities of an editing service

- Provide reviewer-level feedback on grants and manuscripts
- Improve clarity of grants and manuscripts (promote higher-quality reviews)
- Provide input during planning of multi-project grants
- Advise authors on how to implement new requirements (e.g., NIH Biosketch, reproducibility)
- Identify funding opportunities for investigators
- Help investigators choose target journals
- Help investigators plan and write responses to reviewers
- Help trainees plan proposals and papers (reduce PI workload)
- Teach scientific writing to trainees

User survey

We emailed a survey consisting of four open-ended questions to users of each service and received 34 responses (17 each). Top responses are listed.

Users most valued:

- Perspective of outside/knowledgeable reader (13)
- Improvement of readability (11)
- Improvement of logical flow (11)
- Guidelines on structure provided (6)

Users were surprised by:

- Level of detail and solutions provided (15)
- Mentor/peer-like feedback (10)
- Reviewer-like feedback (6)

Users felt the editing service helped:

- Grants get funded or get better scores (16)
- Grants and papers get submitted more quickly/easily (10)
- Papers get accepted (9)

Advice on establishing an editing service

- Editor with a PhD in life sciences will provide different help than one with a degree in English.
- Subject-specific background is not necessary.
- Prior experience as a professional editor is not necessary.
- Look for evidence of clear, linear thinking and good editing skills (have interviewees edit short documents).