

Anatomy of a Research Statement

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Below is the beginning outline of an example research statement. There are many effective organizational strategies for research statements, and people in different institutions or different fields will have different expectations, but this is, in particular, a good starting point for researchers in STEM fields. I'm following a format somewhat like a grant proposal. Grant proposals have a good structure for a research statement, but grant proposals do not have an appropriate writing style or target audience. Use an active first-person writing style; you're talking about yourself and what kind of professor you will be. Clearly state the big picture problems and goals of your research program immediately, and the specific supporting details should be buried deeper within the document.

Overview (or “Overall Goal”, “Motivation”, “Summary”) or even better use a title that conveys what your research theme is

You may start with an introductory statement about your area of research, describing any themes or universal benefits of your scientific goals, and/or what students would get from working with you. If all of your specific aims (described below) fit within a single overarching background, you could provide some brief context here on that topic, but only talk about things the reader needs to know to appreciate the importance of your research questions and their appropriateness for the college and student population. Remember, you're not informing the reader about all the science out there in your area of research, and you're not writing this to tell them what you did in grad school. You're telling the reader what you're going to do as a professor. The details about what is known in the field, or what kind of experience you have, should be included secondarily, only to support your argument that what you're proposing to do will be awesome. List these aims early, and before you do make sure you've **summarized** (broadly and concisely) for the reader what goals/gaps/questions your aims are addressing, why this is important (ie fundable & publishable), and why you and the future students in your lab are going to be successful and awesome at this.

- **Specific Aim 1.** Brief sentence or two introducing an experimental aim, goal, project, question, whatever you want to call it.
- **Specific Aim 2.** Brief sentence or two introducing an experimental aim, goal, project, question, whatever you want to call it.
- **Specific Aim 3.** Brief sentence or two introducing an experimental aim, goal, project, question, whatever you want to call it.

Either here or below, be sure to address why your work is publishable and why it is fundable. If you feel that you need to go on at great length early on describing details of the science to demonstrate or explain an important, often-misunderstood point, consider putting the details in an appendix attached to the research statement. If a search committee member gets to the end of the first paragraph and you have not yet told them your goals and what students will be doing in your lab, you need to re-organize at the very least. Most search committee members do not want to read more than a few pages, but if you believe that your attention to the minute details will catch the committee's attention,

put those gritty details somewhere separate, e.g. in a later section that a general reader does not feel obliged to read. Most people reading this will not be in your field. You need to demonstrate to the reader succinctly that what you want to do is important, feasible, fundable, and beneficial for their students and department. Easy, right?

Example Specific Aims Section

Specific Aim 1. Determine the mechanism by which doodlebops blather. Doodlebops play an essential role in our understanding of the schmestine process. It is currently not known, however, [... blah blah ...] In my lab, student researchers and I will use gargle spectrometry to determine this mechanism. Reaching this goal would have implications for the field of doodlebop optimization etc., [...] which makes this a strong candidate for funding from the BLahbLaH program at the National Science Foundation, as well as undergraduate research grants offered by Important Professional Society. This proposed research will allow students at Fantastic College to [...]. I expect this work to lead to publications with student co-authors in journals such as *Important Professional Society Journal* and *J. Int. Soc. Doodlebops*. Note: Immediately in your description of an aim or goal, tell people what you will do and why it's interesting, fundable, and a good project for the institution.

Approach. Students in my lab will perform experiments using the schmestine process, which is the best way to investigate the mechanism of blather incorporation in doodlebops. In this reductionist approach we can control environmental variables, allowing a refined mechanistic analysis that would otherwise be infeasible when studying doodlebops in the wild. Fantastic College undergraduate students working in my lab would grow schmestine microcosms, controlling growth throughout a series of doodlebop flow rates. Schmestine growth experiments are excellent for undergraduate research, with time frames such that a series of experiments can be easily accomplished over a summer research season. Students additionally will learn diverse laboratory techniques such as [...] or [...] in order to design their experiments. Throughout each microcosm time-series, students will quantify doodlebop levels and monitor the wookie state using the Fantastic College Biology Department's HPLC and GC-MS, respectively. If higher confidence wookie identification is needed prior to publication, we could easily send out the relevant samples for analysis at the Blather Core Facility at Nearby University.

Note: When describing your approach, make sure to explicitly address the following concerns.

- (1) Why is your research feasible at Fantastic College, specifically? (e.g., cost, instrumentation needs, logistics, resources or collaborators in the area if relevant)
- (2) Why is your research a good fit for undergraduate student involvement at Fantastic College?
- (3) What will students be learning to do in your lab? What will they actually be doing on a day-to-day basis?

Significance & broader impacts. A sub-section on broader impacts may be useful (i.e., benefits to students and educational impact on diverse participants). Or, if you just call this section "Intellectual Merits and Broader Impacts," you could keep the first "Specific Aim 1" text short, and describe both the expected scientific outcomes and

broader impacts here (making sure to clearly distinguish between the two).

... Follow with similar descriptions of Specific Aim 2 and Specific Aim 3....

One thing that search committees worry about when reviewing tenure-track job applications is: “What happens if this experiment doesn't work, or becomes irrelevant? Will this candidate be able to develop another avenue of research? Do they have multiple possible paths to explore?” One excellent way to preemptively address that concern is to have multiple Specific Aims that could function as separate projects, independently of one another.

This has been one example of formatting for a research statement. I've seen it done effectively in many different ways. The important points definitely need to be there, though.

A research statement for a Primarily Undergraduate Institution (PUI) should

- Be well organized and succinct
- Explain why the research is important, fundable, and publishable
- Explain why it's good for undergraduate student research
- Explain why it will work well at the specific institution you're applying to
- Describe specifically what students will be doing in your lab/research group
- It's good to show breadth as a researcher and ability to do something else if one thing doesn't work out

Other considerations

- Do you have any figures or diagrams you could include? This helps a lot! Big blocks of uninterrupted text with small fonts are stifling, and frustrating to encounter, for search committee members.
- Write in first-person active voice. Below is an example of turning a passive, third-person statement into an active first-person statement.
 - *Bad passive statement:* “The structures of isolated natural product compounds can be determined by NMR and mass spectrometry.”
 - *More active, and more tailored statement:* “Students and I will identify the isolated natural products using the 400 MHz NMR in the Chemistry Department at Fantastic College, and we will occasionally mail out samples for mass spectrometry when needed.” (and, if important and particularly relevant, maybe mention that you could develop an MRI proposal for that mass spectrometer that the college doesn't have).
- Know the institution you're applying to. Ask around (even contact the department chair or search chair). For example, if your application mentions graduate students and postdocs working in your lab, but the college has no grad students or postdocs, your

application will probably get thrown out immediately.

- Think about the practicality of any time line implied in your research. Something that would take a graduate student a year to accomplish might instead take several years.

Examples of red flags to avoid

- Double- and triple-check that the name of the college and details about their department are CORRECT before submitting the application!
- In a faculty search, we're very wary about whether or not people know what they're getting into. Applicants who appear to think they're applying to an R1 university will not be considered very seriously.
- We're wary about people who might think that a faculty job at a PUI is an easy backup job, like maybe they can just show up to teach their classes and, otherwise, disappear. A research statement might convey this attitude indirectly if the research questions/goals are too short-term and simple, like something a student might do for a class project. Every four-year college wants faculty who will be doing authentic scholarship within their field. Even if the current faculty don't have any recent publications, that does not mean they don't expect you to publish. If there currently isn't much scholarship happening in a department, they probably see it as a problem that needs to be fixed. (But of course, do not insult them by saying they have a problem!)

Activity: Think about your own research plans. Can you list three specific aims that would make for somewhat independent research projects?

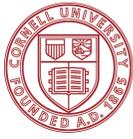
Specific Aim 1:

Specific Aim 2:

Specific Aim 3:

Choose one of those specific aims, and then answer the questions below, through discussion with your partner(s). If there is someone in your group who is further along than others in developing a research plan, have a group discussion about their research within the context of the following questions. Thinking about this with *any* research project will help you with yours later.

- Why is this specific aim worth doing, publishable, and fundable?
- Why is it a feasible aim for an undergraduate institution with limited resources?
- Why is it a good research project for undergraduate students?
- If this aim doesn't work out, would your other two aims still be viable avenues of research? Why? It can't hurt to specifically state this kind of thing in the research statement.



Designing Your Research Statement Around Undergraduate Education

General Research Statement Resources

- Cornell University Graduate School: www.gradschool.cornell.edu/pathways-success/prepare-your-career/take-action/research-statement
- University of Washington Career Center: www.careers.washington.edu/GradStudents/Academic-Careers

Resources with a STEM Emphasis (*Science, Technology, Engineering and Mathematics*):

- University of California San Francisco's Office of Career and Professional Development: <https://career.ucsf.edu/pac-up-4-step-5>
- The Academic Scientists' Toolkit, *Science Careers*: http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2004_04_29/nodoi.9200335458625575487

Cover Letters and Research Statements for the *Humanities and Social Sciences*

While separate research statements may be requested for researchers in the humanities, sometimes that information is requested in the cover letter instead. Check the job advertisement, contact the department for advice, and/or seek advice from faculty about disciplinary conventions.

- Duke University Student Affairs: www.studentaffairs.duke.edu/career/graduate-students/academic-career-preparation/research-statement
- "Dr. Karen's Rules of the Research Statement" (2016) from *The Professor Is In* blog: <http://theprofessorisin.com/2016/09/16/dr-karens-rules-of-the-research-statement/>
- Mark S. Schantz, Undergraduate Research in the Humanities: Challenges and Prospects, *CUR Quarterly*, vol. 29, no. 2, winter 2008: 27-29. www.cur.org/assets/1/7/winter08schantz.pdf
- Todd McDorman, Promoting Undergraduate Research in the Humanities: Three Collaborative Approaches, *CUR Quarterly*, vol. 25, no. 1, fall 2004: 39-42. www.cur.org/download.aspx?id=628

Possible Sources of Grant Funding

- STEM

- NSF Research in Undergraduate Institutions (RUI) and Research Opportunity Awards (ROA): http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5518
- NSF Major Research Instrumentation (MRI) (Separate funding for undergraduate institutions.): http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5260
- NSF Research Experiences for Undergraduates (REU): http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517
- Research Corporation for Science Advancement (Cottrell Awards): <http://www.rescorp.org>
- ACS Petroleum Research Fund: <http://www.acs.org/content/acs/en/funding-and-awards/grants/prf.html>

- *Humanities and Social Sciences*

- List of External Funders from Northeastern University: <http://www.northeastern.edu/research/funding/external-funding-opportunities-2/funding-in-the-arts-humanities-and-social-sciences/>
- National Endowment for the Humanities (especially for Digital Humanities grants): <http://www.neh.gov/grants>