Impact Statements

NSF-RUI Proposals – NSF supports research at primarily undergraduate institutions (PUIs) via the Research in Undergraduate Institutions (RUI) mechanism which is described in the program announcement titled *Facilitating Research at Primarily Undergraduate Institutions*.

All RUI Grant applicants are *SPECIFICALLY REQUIRED* to provide a RUI Impact Statement (up to 5 pages) uploaded into the ***Supplementary Docs*** section of the Fastlane proposal. The RUI Impact Statement provides an opportunity to provide reviewers with information on the potential impact of the proposed research activity on the PIs institution and department, and on the faculty and student participants. RUI proposals are evaluated competitively alongside other proposals submitted to a given program, and special RUI reviewer instructions, which call attention to the RUI Impact Statement and the special circumstances under which RUI investigators work, are supplied to reviewers.

This Impact statement must include

1. ***Information helpful for assessing the likely impact of the proposed research on:***
   - ***the research environment at Middlebury***
   - ***your career (and those of other faculty participants)***
   - ***your department's ability to prepare students to enter advanced-degree programs and careers in science and engineering. "*An enhanced departmental environment may be reflected in direct student training in research and in increased involvement of the faculty in competitive research. These factors, in turn, may lead to improved student preparation, curricular impact and faculty development.*"***
2. ***A brief description highlighting:***
   - ***Middlebury's record and your department's record in educating undergraduates for science and engineering careers***
   - ***your plans to attract qualified undergraduate students to the project, including selection criteria; provisions to increase participation by groups underrepresented in science and engineering. (Underrepresented groups include women, persons with disabilities, African Americans, Hispanic Americans, Native Americans, Alaska Natives, and Native Hawaiians and other Pacific Islanders.)***
   - ***any plans for measuring the effect on students of participating in the project, both during and after students' undergraduate years.***
   - ***(if applicable) anticipated contribution of any new research tools (instrumentation, databases, etc.) to both the education and research opportunities for students and faculty.***

This Impact statement may include

- ***information about factors affecting research productivity, such as teaching loads, availability (or lack) of support personnel, nature of experimental and computational facilities, and features of the student population.***
- ***a brief description of institutional support for student and faculty research activity and the effects of that support on the proposed project.***

Model Impact Statement

Fill in the grey bracketed sections with your individual or department information (usually available from your department coordinator).

******If you copy any portion of this statement verbatim into your grant, add:*** *"Some sections of this Impact Statement are adapted from institutional language provided by Middlebury College."* ***at the bottom,* to cover plagiarism concerns.*****

OGSP TO UPDATE #s

Impact of the Proposed Research on Undergraduate Education

Profile of the Sciences at Middlebury College

Middlebury College is a private, four-year college, founded in 1800 in Middlebury, Vermont. The college's rigorous liberal arts curriculum is particularly strong in environmental studies, international studies, literature, and science. In academic year 2015-16, the college had an enrollment of roughly 2,500 students from all U.S. states and territories and 72 foreign countries. Middlebury has a diverse student body: academic year 2015-16, 10% of the students were international students, and 23% were domestic students of color. Furthermore, 12% of domestic students were members of minority groups that the NSF and NIH recognize as under-represented in science (African American, Hispanic, Native American, or Pacific Islander). [*If an ECON or PSCI proposal, perhaps: The largest major at Middlebury is economics, with 15% of students choosing this major in the 2015-16 academic year. OR More students at Middlebury, 30%, chose majors in the social sciences than in any other division in the 2014-2015 academic year. [If a CHEM, GEOL, PHYS, COMP SCI, BIOL, PSYC proposal, perhaps: Roughly one fifth of Middlebury College students (22%) declared majors in the natural sciences in the 2015-16 academic year. Many of these students choose to pursue doctoral degrees following graduation*

Middlebury College is committed to providing abundant opportunities for scientific research for faculty and students. An example of this commitment is [*the College's budget of over $1,200,000 for new and replacement equipment, maintenance, science technical support staff, and cost-sharing requirements for faculty grants. The college has endowed research funds that provide more than $275,000 of support for student-faculty collaborative research in the summer and budgets nearly $120,000/year for the Undergraduate Collaborative Research and Faculty Research Assistant Funds that support academic year as well as summer research efforts. In 2007, with the support of a grant from the Kresge Foundation, the college established an endowment (currently valued at $1.7M) to replace scientific equipment. Each year, Middlebury provides up to $1,600 to senior thesis students and up to $3,000 per faculty member for support of research or travel for research purposes domestically and up to $3,000 per faculty member for support of research or travel for research purposes internationally.] [If a CHEM, GEOL, PHYS, COMP SCI, BIOL, PSYC proposal, perhaps: The College has a 116,000 square-foot science facility — McCardell Bicentennial Hall — that provides an average of 500 square feet of high-quality research space for each faculty member in the laboratory sciences. The College's Strategic Plan specifically calls for strengthening the undergraduate science research environment by increasing curricular requirements for laboratory science exposure. In furtherance of that strategic plan, in 2011 and 2013 Middlebury competed in the USDoE Solar Decathlon. As the only liberal arts college participating each time, Middlebury's interdisciplinary, student-led teams finished fourth out of 19 in 2011 and eighth out of 19 in 2013, while competing against teams from large universities, both domestic and foreign. Recently, Middlebury received a $1.7 million grant from the National Science Foundation to build the R/V David Folger, a 48-foot research vessel equipped with state-of-the-art instruments dedicated to teaching and faculty and student research. Starting in the fall of 2015, Middlebury College will offer full-tuition scholarships annually to 10 urban students pursuing careers in science, technology, engineering, and math (STEM) through its partnership with The Posse Foundation.*]

A strong indicator of the merit of the research conducted by Middlebury faculty is their success in securing external research funding. In the past five fiscal years (FY12-FY16), Middlebury has received over $4.4M from NSF for faculty research projects, undergraduate research initiatives, equipment, curriculum development projects, and conference hosting. *The x Dept alone has secured $ in external funding from all sources in the past five fiscal years (see table below).*

Biology	*$352,155*

Chemistry & Biochemistry	*$591,000*
Computer Science	*$469,537*
Economics	*$75,374*
Geography	*$388,837*
Geology	*$1,476,048*
Physics	*$642,154*
Math	*$0*
Psychology	*$23,680*
Sociology/Anthropology	*$211,501*

[Your Department] at Middlebury College

The primary mission of the [Your Department] is to sustain and nurture the scientific interests of our students, and to encourage some to seek advanced training at graduate and professional levels. We expose all our students to the most exciting aspects of [your field] in their introductory courses and provide them with opportunities to experience the rewards and frustrations of [*scientific research* or just *research*] first-hand. This approach is flexible, designed for students bound for graduate school in [your field] and for those seeking careers in [relevant or common career paths in your field] and other areas where knowledge of basic facts and theories in [your field] and the ability to interpret critically this knowledge are valuable skills. [Then include a sentence or two describing numbers of department grads choosing relevant career paths and recent post-graduate awards].

[Finish this section discussing specific departmental information (like faculty numbers), equipment, effect of research on curricular development, specific examples of outstanding student involved research, special departmental funding, or other unique attributes of your department that will help stimulate student interest in your field or help support your proposal – for example (from Sallie Sheldon): Another key factor in stimulating student interest in biology is the opportunity to participate in summer research. Specifically, the opportunity to be engaged in the proposed field work at the Plum Island site is a real draw for recruiting students.

A Focus on Undergraduate Research

A distinctive feature of Middlebury College that makes it appropriate for a RUI award is its focus on providing abundant opportunities for undergraduate research. Middlebury has involved undergraduate students in summer research for nearly 50 years, and the number of undergraduate students participating in summer research has recently increased over the past decade from approximately 90 in summer 2006 to over 140 in summer 2016. In 2016, more than 142 undergraduates participated in summer research on-campus research with a faculty mentor and 55 projects were presented at the summer research symposium, the largest number in the history of this event. In the [Your Department] a senior research thesis is required for departmental honors, and most students who plan to do a senior thesis remain on campus for the summer after their sophomore or junior year to begin their research, with [X] students participating this summer [(200X)]. The proposed RUI project will help Middlebury to maintain its commitment to providing undergraduate research experiences by providing support for students conducting summer research and support for students doing academic-year research for thesis or independent study credit. These experiences are an important part of undergraduate education, and they exercise students' growing abilities to ask and answer questions, as the students equip themselves intellectually to become lifelong learners.

The work done in both our [depending upon whether your department has a specific "**NAMED**" program, either: *summer research program* or *Summer Research Experience Program* or *Middlebury Summer Undergraduate Research Experience*] and the senior honors thesis program is often noted by students as the most valuable part of their undergraduate experience. These programs engage students in the meritorious research of our faculty, providing opportunity to closely collaborate with a faculty member in original research. This high level of faculty-student interaction is facilitated by Middlebury's focus on undergraduate research which creates an atmosphere of [*scientific* or *research* or *scholarly*] excellence (notably without graduate students). This atmosphere can often foster strong research interests in students who might feel overlooked at a large university.

Impact on Training of Students

The proposed research will provide opportunities for numerous students to be directly involved in original research. [Go on to describe specifics regarding student make-up of the proposal, what their responsibilities will be, and how they will benefit from this work.]

[Describe how students will be involved in the dissemination of their research findings, i.e. presentations at a specific conference, poster sessions, manuscripts, etc.]

[Does this research specifically feed into teaching? If so indicate how.]

[Provide evidence of your past success with students in regards to the numbers who have performed research with you or provide anecdotal evidence for your ability to provide this opportunity to students. Some successful RUIs from Middlebury have approached this by including photos of students receiving research awards and/or student quotes regarding the benefits they gained from working in their lab. Other have provided a brief description or list of past successful students who have gone on to pursue careers in fields related to this proposal – it is recommended that you include only those students who have a confirmatory record of research with you, either through a publication or thesis.]

Impact on the Career of the PI [Some (esp. more senior faculty) exclude this section]

Research projects of this type also directly benefit faculty members. Faculty members at Middlebury College are afforded innumerable one-on-one interactions with students: faculty and students design and implement research plans, analyze and interpret data, and collaborate on presentations and writing. Students at Middlebury are superb by any measure. They are excellent critical thinkers, have a thirst for research, welcome the opportunity to work directly with faculty members, and have been remarkably beneficial as collaborators.

Teaching at a liberal arts college is an intensely consuming activity, however, and in the absence of sustained funded support, [complete this sentence by describing how the teaching load at Middlebury (if indeed it does) affects your research productivity. Then include examples of your research or curricular successes despite this difficulty. Be sure to include how the students at Middlebury have aided you in your endeavors.]

Describe past grant involvement and how this has aided in your career development: focus on NSF-funded or grants which relate to this RUI proposal. Also describe any special arrangements with Middlebury that will facilitate your work on this grant].

Funding for this project would make it possible to [complete this sentence with specific information regarding how this proposal will allow you to improve your research (e.g. a bigger scale project) and improve student research training.]

Some sections of this Impact Statement are adapted from institutional language provided by Middlebury College.

People to Contact for Help

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108 Davis Family Library
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Franci Farnsworth
Associate Director, Grants and Sponsored Programs
107 Davis Family Library
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Helpful resources used to develop this model statement:

For college "mission" language and general info:

1) The Introduction to the College Catalog.
2) Departmental home pages.
3) Middlebury website: About section: http://www.middlebury.edu/about
4) Middlebury website: Science and Math: http://www.middlebury.edu/science
5) Knowledge Without Boundaries – the College's 2006 strategic plan

For student body statistics:

1) Office of Assessment and Institutional Research

For grants information and financial research support:

1) Office of Grants and Sponsored Programs
2) Dean of Faculty Development and Research.

For summer student research statistics:

1) Undergraduate Research Office
2) Department coordinators