Summer Research Opportunities for Undergraduates: Trends and Best Practices

In this report, The Hanover Research Council examines trends and best practices in summer research programs designed for undergraduate students. The report presents profiles of the programs designed by 11 U.S. institutions of higher education, highlighting common trends in program structure, admissions, activities, faculty responsibilities, and student compensation.
Introduction

Undergraduate research opportunities have taken on increasing importance in higher education over the past decade. As institutions struggle to balance the research demands of faculty members and the increasing need for students to engage in academic research as preparatory work for competitive graduate programs, many have developed undergraduate research programs offered during the summer term.

The value of summer research opportunities for undergraduate students has been supported by a number of studies and publications. According to a literature review prepared for the Association of American Colleges and Universities, such programs produce a number of positive student outcomes, including “improvement in writing and communication skills; increased frequency and quality of interaction with faculty and peers; gains in problem-solving and critical thinking; higher levels of satisfaction with the educational experience; and greater chance of enrollment in graduate school.”\(^1\) Other benefits include improved research and time management skills and greater intellectual curiosity. Finally, the results of a national research study suggest that undergraduate research experiences increase students’ interest in doctoral programs and science, technology, and engineering career pathways.\(^2\)

In this report, we examine best practices in undergraduate research programs. We present profiles of the programs established at 11 U.S. institutions of higher education, listed below.

- University of Arkansas
- Yeshiva University
- Washington State University
- University of Minnesota
- University of California, Berkeley
- University of Michigan
- University of Alabama at Birmingham
- Pepperdine University
- University of Massachusetts, Boston
- Wofford College
- University of Wisconsin-Madison

Following the individual program profiles, the report briefly discusses best practices in program function, design, and administration. The final section details the

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2 Ibid.
Research Experiences for Undergraduates (REU) program funded by the National Science Foundation (NSF).

Key Findings

Our examination of current programs reveals several commonalities in program structure and administration, though some variance occurs from one program to the next. Below, we highlight some of the key findings of our research:

- **Target Demographic:** Based on the 11 programs examined in this report, it appears common for institutions to explicitly offer summer research opportunities for students who do not regularly attend the institution. This admissions restriction enables institutions to extend access to research experiences to students who would not otherwise enjoy such opportunities. However, at the same time, many institutions extend parallel programs to students within the institution. Furthermore, many programs make it a point to encourage applications from women and minority candidates.

- **Admission Requirements:** Not all of the reviewed institutions list a specific grade point average. The selected institutions do, however, invariably state that the undergraduate research programs seek high-achieving students. Based on the requirements of the institutions that do list a minimum GPA, one can assume that the typical student participant has earned a GPA of at least 3.0, and likely higher. In science-oriented programs, it appears to be uncommon for institutions to require that applicants have declared a certain major or concentration, though many programs do encourage students with backgrounds in a desired field of research to apply.

- **Participant Activities:** The institutions reviewed for this report do not provide substantial detail on the day-to-day activities of student participants. In many cases, students take on a role akin to an intern. Students may conduct independent research projects or, alternatively, work as research assistants on existing faculty research projects. Most programs supplement direct research work with workshops and meetings that stress the basics of research, ethical issues, preparation for graduate study, and related topics.

- **Faculty Role:** Faculty members typically serve as mentors in undergraduate research programs. Depending on the number of students admitted, faculty members interact with students at a ratio as low as one to one.

- **Financial Considerations:** All of the programs encountered in our research award some form of financial compensation to student participants, which balances the full-time commitment of the summer program. Compensation for students most often comes as a combination of room and board and a stipend for the
research work. Most institutions also make an effort to help cover students’ travel costs to and from the program, though some set geographic limits for the coverage. In the reviewed programs, stipends typically range between $3,000 and $5,000.

- **Duration:** Programs typically last from eight to ten weeks. This time period allows for a balance between in-depth research work and a short summer vacation.

- **Extracurricular Activities:** The extracurricular offerings of the reviewed programs showcase an asset not immediately connected to the research mission. From a concert series to a jazz festival to a world class harbor, local cultural attractions are a selling point for several programs. Program materials tend to stress multiple opportunities for students, including both cultural and recreational events.

- **Innovative Practices:** While several commonalities exist from one program to the next, a few programs stand out for their unique aspects. The University of Arkansas, for instance, offers a cash award to the top-achieving student at the conclusion of its summer research program. The Community of Scholars program at Wofford College also utilizes a unique structure. In this program, students propose their own research project and seek support from a faculty sponsor. Both student and faculty member then apply to the Community of Scholars program, which judges potential participants on the quality of the proposal and the likelihood of a significant contribution to the program. Wofford's program also puts a great deal of emphasis on interdisciplinary interaction.
Program Profiles

University of Arkansas

At the University of Arkansas, the Ozark Research Experience for Undergraduates focuses on chemical and biochemical research, including organic, analytical, biochemical, and inorganic chemistries, as well as nanoscience and chemical sensors. The program, which is in its 22nd year, is sponsored by the National Science Foundation’s Research Experiences for Undergraduates program. It is open to nine students per year.

Student participants enroll at the University of Arkansas for the summer session and receive one hour of research credit for completion of the program. During the program, participants visit the Arkansas Eastman Chemical Facility or the National Center for Toxicological Research. At the conclusion of the program, participants present the results of their summer projects. The University presents the Tony Jude Award—which carries a cash prize—to the top-achieving student.

While financial support is contingent upon NSF funding, participating students receive a scholarship of between $3,000 and $5,100, a housing allowance of up to $1,600, and $500 for meal expenses. Participating students also receive $300 to attend a national or regional conference.

Yeshiva University

Through its Albert Einstein College of Medicine, Yeshiva University administers two summer undergraduate research programs which aim to serve both Yeshiva students and students from other postsecondary institutions who come from underserved backgrounds. Through the Summer Undergraduate Research Program (SURP), Yeshiva University gives fifty non-Yeshiva students the opportunity to conduct original research in a laboratory. The program is designed for undergraduates who have a strong background in the sciences and strong interest in pursuing a research-oriented career path. The program is tailored for outstanding students completing their junior year, though occasionally sophomores with strong science and research backgrounds may be considered. The primary fields of interest in the program are biology, biochemistry, physics, chemistry, bioengineering, and chemical engineering.

SURP participants receive a $3,000 stipend, as well as up to $500 in transportation assistance for students living outside the New York City metropolitan area. The students also enjoy free housing in the student residence complex on the Einstein

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4 Ibid.
campus.

During the program, students engage in a number of scientific research exercises. Outside of the actual research projects, students gain exposure to other aspects of the scientific life. They engage in small group meetings with other students for research discussions, attend weekly faculty seminars on research topics, and take part in workshops on topics such as ethical issues in science and science career planning. Outside of the research and career-oriented activities, students also take part in regular recreational activities. The 2009 SURP program included a barbecue, a student mixer, a trip to a Broadway show, a trip to the New York Academy of Sciences, Bronx Zoo day, and a series of programs known as “Food & Focus.”

Another research opportunity at Yeshiva—the Roth Institute Scholars Program’s Summer Undergraduate Honors Research experience—is open to undergraduate students already enrolled at Yeshiva. The program, which lasts eight to nine weeks, allows participants to work in an active basic biomedical research laboratory at the Albert Einstein College of Medicine. The program is typically limited to applicants who have completed their junior years, and students who have already attained a bachelor’s degree are ineligible. Program participants can apply for independent credits for the work completed during the program, though these credits are not transferrable to major requirements or Honors Program requirements.

Student participants receive $2,500 scholarships to attend the program, though they are responsible for the cost of travel, meals, and other incidental expenses. Housing is available within the medical school complex for students who request it. Similar to participants in the SURP program, attendants have several social opportunities, including a baseball game, a day at the Bronx Zoo, a Broadway show, a student mixer, and assorted student-faculty luncheons and barbecues.

**Washington State University**

Washington State University’s Laboratory for Atmospheric Research (LAR) Experience for Undergraduates is open to ten students each summer. The program is supported by the National Science Foundation. The program’s stated goal is to provide undergraduate students in engineering and related fields the opportunity to take part in ongoing, active research programs. The program strongly encourages applications from women and minority students.

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7 “Roth Institute Scholars Program.” Yeshiva University. http://staging.mc.yu.edu/advisement/Roth%20Program%20Application.htm
The program accepts applications from college students of all levels—the freshman through senior years—and the only restrictions are that students must be currently registered at a two-year or four-year institution and must not have earned a bachelor’s degree prior to the start of the program.

Students gain firsthand exposure to research projects, which range from running large-scale air quality models to utilizing satellite imagery to determine air quality. Participants take part in half-day workshops designed to introduce students to the basics of atmospheric chemistry, measurements, and modeling. Workshop topics include climate change, atmospheric chemistry, atmospheric measurements, modeling, data analysis and visualization, scientific writing, and poster presentation. Students also have the opportunity to visit the Pacific Northwest National Laboratory, a government-operated research lab.

The program runs nine and a half weeks, at the end of which students prepare a poster and present their results during a poster symposium for all of the WSU Research Experience for Undergraduates (REU) programs. Students receive a stipend of $4,000, free off-campus housing, and travel assistance to and from Pullman, WA.

University of Minnesota

The Life Sciences Summer Undergraduate Research Program is an umbrella program which encompasses six University of Minnesota life sciences summer programs. The programs begin with a joint orientation week, after which participants begin a ten-week research project under the direction of a faculty member.

The six life sciences fields covered by the program include:

- **Molecular Genetics and Proteomics:** Students take an intensive three-week laboratory course at Itasca Biological Station & Laboratories and a workshop in proteomics before spending the remaining seven weeks participating in a molecular genetics research project.

- **Neuroscience:** Students spend ten weeks engaging in research at one of the more than 100 neuroscience laboratories on campus. Students also attend neuroscience seminars and presentations.

- **Heart, Lung, and Blood Program:** In this National Institute of Health (NIH) funded program, students spend ten weeks in clinical or basic research programs focusing on the molecular and cellular basis of cardiovascular and other disorders.

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Global Change Ecology: An NSF Research Experience for Undergraduates (REU) project, this program introduces students to global change ecology research and data sets. Students conduct independent research with faculty mentors at the Itasca Biological Station and Laboratories, where they have access to continuously downloaded climate and limnological data.

Microbiology: Also an NSF REU program, this program recruits talented undergraduates from across the country. The program begins with a five-day mini-course to refresh basic laboratory skills before students advance to workshops and field trips with a focus on scientific communication and research career options. The program culminates in a University-wide summer research symposium and poster session. At the core of the program is an independent research project, during which students are mentored by a faculty member. Topics for these projects range from subatomic virus structure to microbial ecological influence.

Risk Analysis for Introduced Species and Genotypes: Another NSF-funded project, this program—which acquaints undergraduates with the ecological risk that comes with introduced species—places a strong emphasis on recruiting women and minority candidates. The program pairs each student with a faculty mentor to conduct research projects on issues surrounding introduced species and genetically modified organisms.

The table below details the compensation packages for participants in each program.10

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*Round-trip airfare only (approximate value).

In addition to the events described above, the program as a whole offers a number of enrichment events for participants. These include a graduate program fair, a picnic for all program participants, a seminar series, and a final poster symposium.

University of California, Berkeley

The Summer Research Opportunity Program (SROP) at UC Berkeley was established to promote access to graduate education among educationally or economically disadvantaged undergraduates. The program targets undergraduates who may not have had the opportunity to be exposed to a research university’s academic environment. Program opportunities span the arts and humanities, social sciences, and physical sciences.

UC Berkeley SROP participants enter the program as “interns” and take part in an eight-week program, the overall goal of which is to increase the level of diversity among future graduate students through research conducted under faculty mentorship. Eligible students must be citizens or permanent residents of the United States and enrolled full-time at a four-year college or university. The program is open to rising sophomores, juniors, and seniors who are not graduating in the spring or summer of the year of the program, though graduating UC Berkeley students are eligible for the program. Students are ineligible if they have already completed a bachelor’s degree. Furthermore, applicants must have a minimum cumulative grade point average of 3.0 and have shown potential for success in their field.

Students complete the program under faculty sponsorship and, upon acceptance, are paired with a faculty member, though the institution does not guarantee that students will work in their specified field of interest. The program consists of substantive research, requiring a full-time commitment of five days a week for forty hours from students. Participants engage in supplemental activities such as weekly workshops, meetings with other students and faculty, and GRE preparation. The program culminates in the submission of a final research paper and a final presentation of the student’s research findings. SROP participants receive a $3,000 stipend upon acceptance to the program. The program also covers their cost of travel, as well as room and board.

UC Berkeley also hosts the Amgen Scholars program. This is a national program meant to increase research opportunities for students interested in the sciences. The program provides research experiences for students and aims to increase participants’ competitiveness for positions at graduate and professional institutions. The program encourages pursuit of PhD or MD/PhD degrees and research careers in the sciences and biotechnology. Organizers of the program strongly encourage applicants from

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diverse populations to apply.$^{12}$

In order to be eligible, applicants must be U.S. citizens or permanent resident undergraduates enrolled in a four-year U.S. college or university. Applicants can be sophomores, juniors, or non-graduating seniors, but must have a cumulative grade point average of at least 3.2.

The Amgen Scholars Program is a ten-week program in which participants engage in laboratory research during the week. Students gain hands-on experience in a faculty member’s laboratory, working directly with faculty, postdoctoral scholars, and graduate students. Students participate in weekly lab meetings, the lab’s journal club, and other activities. They also participate in weekly seminars and workshops on a wide range of topics, from scientific education to GRE preparation. Amgen Scholars also participate in collaborative workshops and social activities with other summer research program participants. Participants receive a $3,800 stipend, round-trip travel to Berkeley, room and board, and college course credit.

**University of Michigan$^{13}$**

The Research for Undergraduates Program is a ten-week summer research program for non-University of Michigan students. The program is conducted in coordination with the NSF REU program, thus receiving funding from the National Science Foundation. Additional funding for the program comes from University of Michigan departments such as the Undergraduate Research Opportunity Program, the Women in Science and Engineering Program, and the Office of Financial Aid.

Participants in the program receive a $4,500 stipend and a $300 “MCard” for food purchases on campus. Additionally, participants receive access to all university recreational facilities, access to the Society of Physics Students office on campus, one-on-one instruction from University of Michigan faculty, and free housing and meals.

Active research areas within the program include:

- Astrophysics/Cosmology
- Atomic, Molecular, and Optical Physics
- Biophysics/Medical Physics
- Condensed Matter Theory
- Condensed Matter Experiment
- High Energy Theory
- High Energy Experiment

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$^{12}$ “UC Berkeley Amgen Scholars Program Overview.” University of California, Berkeley. http://www.amgenscholars.berkeley.edu/about_us.html

Nonlinear Dynamics/Complex Systems
- Nuclear Physics

University of Alabama at Birmingham

At the University of Alabama at Birmingham (UAB), the Summer Program in Neuroscience (SPIN) originated from an NSF REU program, but it is now jointly sponsored by UAB’s Department of Neurobiology, the Civitan International Research Center, and the Intellectual and Developmental Disabilities Research Center at UAB. The stated goal of the program is to provide motivated undergraduates with neurobiology research experience under the guidance of a faculty member. The program aims to increase student interest in graduate education leading to careers in biomedical research and research medicine.

The program covers the cost of room and board, and in some years additional meal costs. Participants receive $400 a month as a stipend over the nine-week program.

On the final day of the program, participants take part in a poster presentation session, wherein they present the results of their research. Outside of the research activities of the program, administrators try to make Saturdays general extracurricular days for participants. Saturday excursions in the past have included movie trips, zoo trips, and assorted cultural excursions such as a jazz festival and other concerts. Program organizers typically try to have tickets to these events donated to the program so as to save on costs.

Pepperdine University

Pepperdine University’s biology department conducts a summer research program geared specifically toward undergraduates interested in biological research, science education, environmental science, or biotechnology as a career path. The ten-week program begins with a 14-day orientation workshop during which students become familiar with the uses and limitations of certain research tools and techniques.

Applicants to the program must have completed one year of biology by the commencement of the program. Applicants must also be U.S. citizens or permanent residents and current undergraduates. Students who have already earned a bachelor’s degree are not eligible to participate. Participants must also be available full-time between mid-May and the first of August to take part in the program.

Accepting eight participants per year, the program covers the housing costs for

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participants. Students also receive a stipend between $3,000 and $5,000 for participation.

**University of Massachusetts Boston**

The University of Massachusetts Boston’s summer research opportunity is also an NSF REU program. It focuses on integrative and evolutionary biology. Open to ten to twelve students per year, the program stresses the integration of the different fields of biology. Program organizers note the cultural and ethnic diversity of the program as an intentional development meant to foster growth in the number of women and minority candidates entering graduate research in the sciences.

The ten-week program is open to U.S. citizens and permanent residents who are currently undergraduates and have completed at least one semester of biology. Participants receive a $4,200 stipend plus a room and board allowance of $2,500. Additionally, participants can apply for reimbursement for travel expenses.

Participants take part in enrichment activities meant to build community among students and faculty, teach communication skills, enhance understanding of modern biology issues, and prepare students for advanced work in the discipline. The program includes weekly discussions and workshops focused on practical, personal, and ethical aspects of research. In addition, participants take field trips in and around Boston Harbor.

**Wofford College**

Wofford College has established the Community of Scholars program, a cross-disciplinary program in which students pursue independent research projects under the direction of faculty members. The program runs for ten weeks during the summer and is focused on the creation of cross-disciplinary dialogue.

Wofford’s program is unique in that student participants design projects and attract an interested faculty sponsor. Also setting the program apart is a focus on cross-disciplinary dialogue and a focus on community creation. The program is tailored to bring about the sort of interactions that make science fellows retool their presentations so that they are more easily understood by humanities participants, and vice versa.

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17 "Research Experiences for Undergraduates in Integrative and Evolutionary Biology.” University of Massachusetts, Boston.  
http://www.bio.umb.edu/undergraduate/research_experiences_for_undergraduates.html

18 "Summer 2010.” University of Massachusetts, Boston.  
http://www.bio.umb.edu/undergraduate/research_experiences_for_undergraduates_details.html

http://www.wofford.edu/communityscholars/communityscholarsfaqx.aspx
Applicants to the program must be Wofford College students. Students develop their proposals in consultation with the faculty member who will serve as their contact throughout the research. Student selection is up to a Coordinating Committee, which takes into account academic qualifications, the strength of the project proposal, faculty mentor recommendations, and a judgment of the applicant’s likely contribution to the Community of Scholars. The Coordinating Committee similarly selects faculty members based on instructional and research qualifications, the strength of research projects, and the faculty member’s likely contribution to the program.

Participants commit to full-time work for at least nine of the ten weeks of the program. During such time, students live in the Wofford Village Apartments. Students enrolled in the research program may not pursue other summer school classes, take on employment opportunities, or commit to other obligations impinging on their ability to dedicate time to the Community of Scholars Program. Participants attend formal text-based roundtable discussions, wherein students are fully expected to contribute to the conversations.

Participants are awarded a stipend of $5,000 for the duration of the program. A portion of the stipend is paid upon completion of a presentation during the Research Symposium scheduled during the academic semester.

**University of Wisconsin-Madison**

UW-Madison’s Research Experience for Undergraduates in Nanotechnology was established in 2006. The program takes eight to ten highly qualified undergraduates from across the nation for a ten-week paid internship during which they work in the laboratory of a UW-Madison faculty member. As nanotechnology is an interdisciplinary field, students tend to come from chemistry, physics, chemical and biological engineering, pharmacy, materials science and engineering, genetics, biochemistry, and mechanical engineering programs.

Preferred applicants are undergraduate students majoring in a science, technology, engineering, or mathematics specialty with a strong desire to complete a Ph.D. The program is open to students who have completed their sophomore or junior year with an overall GPA of at least 3.0.

Participants conduct research in areas such as the hard sciences, science education, and public policy. Participants receive a financial support package of approximately $5,000, which includes a $4,000 stipend for the program duration, travel expenses to and from the program, housing in University dormitories, and a meal program for on-campus dining.

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Best Practices

Despite the prevalence of undergraduate research programs conducted during the summer term, the literature regarding the efficacy of such programs and best practices in the area is surprisingly sparse. Our examination of best practices takes into account the available studies on undergraduate summer research work in combination with the practices evident in the individual programs profiled in the previous section. Below, we discuss the major concerns program designers will likely face as they develop summer research programs.

Participant Duties

Exemplary summer research programs are the ones that most prepare students for a life of research-oriented work. To that end, successful programs will provide participants with opportunities for “real life” applications of the concepts and skills they learn. Participants should become familiarized with the processes of research publication, presentations, and project implementation. The objective is an accurate portrayal of the working life of a researcher, and this is the key aspect of the summer program that will most help the student decide whether or not scientific pursuit is a career path he or she wishes to undertake. Student participants should not be used to fill secretarial or organizational roles for faculty members or departments. Rather, they should be exposed to every level of the research process to which they can be safely exposed. For this reason, a number of institutions do not have students work as “assistants” to professors engaged in extant projects, but instead have them operate as independent researchers under the guidance and mentorship of a faculty member. Through this arrangement, students are more engaged in and responsible for their own projects, which more closely mimics the “real” position of a scientific researcher.21

Program Content

In many cases, undergraduate research programs provide students with opportunities to work on research projects that are relevant at the local level—whether to the institution itself, the region, or the state. The winners of the national Conference on Undergraduate Research/Alice and Leslie E. Lancy Initiative award for excellence in summer undergraduate research programs exemplify this to an extent. Previous winners have included:

- The College of William and Mary – Crossroads Research: Students examined the impact of undergraduate service to the Williamsburg Community.

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University of Puerto Rico at Humacao – Water Resources of the Humacao Region of Puerto Rico: Students studied the water resources of Puerto Rico in collaboration with scientists, artists, social scientists, and communicators.\textsuperscript{22}

Examples such as those above illustrate the potential for localized or specialized research within the context of a summer program. Though potentially more limited in scope, it is possible that this sort of research, due to its more proximal nature, can more effectively impress the real world implications of research upon students.

Faculty Role

Based on the institutions reviewed for this report, the most common role for a faculty member to assume in the context of summer research programs is that of mentor. As program coordinators select faculty members, they may do well to recruit and solicit applications from faculty members interested not only in research, but in taking on a mentoring role for undergraduate students.

Faculty Participation

A number of institutions in the past have encountered faculty resistance to summer research programs. Some deem undergraduates to be unreliable and risky because, in many cases, they have not fully committed to the discipline and may change majors over the course of the program. Undergraduates may also be unwilling to commit a sufficient amount of time and energy to the project as would graduate students, which could translate to a poor return on investment for faculty time. Some faculty may also believe that partnering with undergraduates on research projects constitutes a risk to their pursuit of tenure, as low productivity from undergraduates could slow progress on their research and subsequent publication.\textsuperscript{23}

Institutions, then, will need to actively combat such notions before they will see a wider degree of faculty participation. There are a number of ways to go about such a process. The chemistry department at the University of San Diego, for instance, recently underwent a process to integrate undergraduate research more fully into its tenure policy. Participation in undergraduate research is not explicitly written into the University’s promotion and tenure policy, but the USD administration asked individual departments to articulate their own expectations for promotion and tenure, which should align with the institution-wide policy. As a result, the chemistry department has made mentoring undergraduates in research one of the means by which chemistry professors fulfill the “teacher-scholar” aspect of the tenure guidelines. The department also hired support staff to ease the transition. Adjunct


faculty members now coordinate research opportunities for students, and participating faculty are now granted reassignment time for taking on set numbers of students for research, resulting in teaching load reductions.  

Another institution that strongly encourages faculty members to take part in summer research programs is the University of Michigan. In an effort to recruit faculty members for the Undergraduate Research Opportunity Program, organizers have developed a list of the “Top 10 Reasons” why faculty members, research scientists, and postdoctoral scholars should consider participation. Among the reasons, most of which are applicable within any summer program, are:

- The ability to start a new project, complete background research for potential future projects, or secure extra assistance with current projects
- The opportunity to work with bright students who are interested in and motivated to complete research
- The opportunity to work with students who do not cost the project money and may be a part of the project for several years
- The potential to receive funds in support of the faculty-student partnership ($500-$800 per student)
- The opportunity to find students who have training in all areas of research, from laboratory safety and animal handling to proficiency with programs such as SPSS, STATA, and Research Integrity
- The opportunity to interact with undergraduate students who bring to the table fresh points of view and positive attitudes about research
- For postdocs, the opportunity to gain additional instructional experience and to work in a mentor role

Financial Considerations

According to our review of summer research opportunities, stipends appear to be an indispensable aspect of the program structure. It is likely that many students will not be able to afford to participate in unpaid summer internships. It often falls to the institution to identify a method to reimburse students for their time and work beyond the research and academic experience they gain. While it appears that most institutions offer a stipend to student participants, the size of the stipend is necessarily dependent on institutional and departmental finances, program size, and external funds.

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24 Ibid.
Overview of the NSF Research Experiences for Undergraduates Program

The Research Experiences for Undergraduates (REU) program is the National Science Foundation’s vehicle for supporting active research participation among undergraduate students in the following areas of research funded by the NSF:

- Engineering
- Mathematical and Physical Sciences
- Geosciences
- Computer and Information Science and Engineering
- Biological Sciences
- Social, Behavioral and Economic Sciences
- Education and Human Resources
- Polar Programs
- International Science and Engineering
- Cyberinfrastructure

Each year, the NSF grants between 1,700 and 1,800 awards (Standard Grants, Continuing Grants, and Cooperative Agreements) to REU candidate programs. Anticipated funds for fiscal year 2008 totaled $57,000,000.27

The NSF asserts that eligible student participants must be U.S. citizens or permanent residents. Students must be enrolled in a part-time or full-time degree program at the baccalaureate or associate level, though students in process of transfer from one institution to another may participate during the intervening summer term. Furthermore, high school graduates who have gained admittance to an undergraduate institution but will not begin their studies until the fall semester may participate during the previous summer term. One restriction is that students may not participate if they have already earned a bachelor’s degree. The NSF further stipulates that a substantial portion of the REU participants should come from outside the “host institution or organization.”28

The REU program, through Sites and Supplements, provides students with valuable research experiences. Students participate in either existing research projects underway at the institution or projects designed specifically for the program. The goal of the program is to promote high quality student-faculty interaction through research mentorship, as well as improve access to research facilities and development opportunities. The NSF encourages REU grant recipients to involve students of

27 Ibid.
28 Ibid.
underrepresented groups in STEM research, including “women, underrepresented minorities, and persons with disabilities…”

REU Sites, based on independent proposals, engage a specified number of undergraduate students in research projects on-campus. The NSF explains:

REU Sites must have a well-defined common focus that enables a cohort experience for students. These projects may be based in a single discipline or academic department, or on interdisciplinary or multi-department research opportunities with a coherent intellectual theme. A proposal should reflect the unique combination of the proposing organization’s interests and capabilities and those of any partnering organizations. Cooperative arrangements among organizations and research settings will be considered so that a project might increase the quality or availability of undergraduate research experiences. To extend research opportunities to a larger number of undergraduates, proposers might also consider incorporating approaches that make use of cyberinfrastructure or other advanced technologies that facilitate research, learning, and collaboration over distances.

Meanwhile, REU Supplements provide financial support for just one to two students who will take part in a new or ongoing research project funded by the NSF. That said, large research projects may request financial support for a number of students appropriate for the project’s size and nature. Researchers may obtain REU Supplements through two avenues:

1) Investigators holding an existing NSF research award may submit a request for supplemental funding.
2) Proposers may include an REU Supplement activity as a component of a new (or renewal) research proposal to NSF.

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29 Ibid.
30 Ibid.
31 Numbered points taken verbatim from: Ibid.
Project Evaluation Form

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