

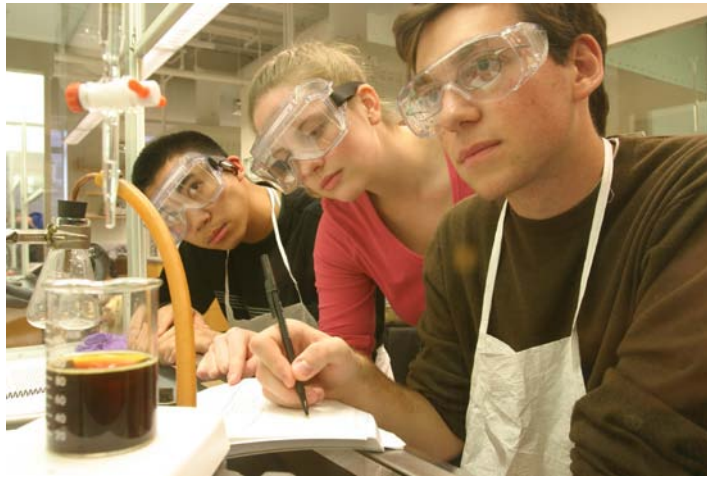


BROWN

**Boldly Brown:
Campaign for
Academic
Enrichment**

Undergraduate Research

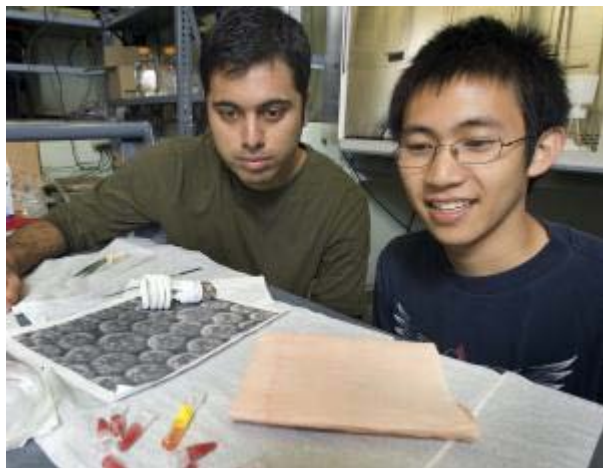
A Case for Support



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Undergraduate Research: Celebrating Discovery

Whether the work takes place in the dust of a Turkish village or in a dish of proteins refrigerated in the Life Sciences building, Brown University meets its undergraduates' intellectual curiosity with a rich array of research opportunities. As a short list of their recent research confirms—*hyperbolic geometry, molecular beacons, Homeric encyclopedias, terrorist financing*—Brown's reputation for academic freedom attracts innovative, enterprising undergraduates. With these opportunities, students are directing and deepening their academic study, forming life-changing collaborations with professors, and establishing a vision for life beyond Brown.



Undergraduate research support is available through programs administered by the Dean of the College, including Undergraduate Teaching and Research Awards (UTRAs) and the Dean's Undergraduate Research Fund. An UTRA offers students the opportunity to work closely with a faculty member on a carefully designed research project or curricular innovation, while the Dean's Undergraduate Research Fund covers costs for students pursuing a variety of research endeavors. An UTRA provides a fixed stipend for a specified project timeframe, usually 35 hours a week for ten weeks during the summer or 10 hours a week for

a semester; the Dean's Fund provides grants of \$500 and up to defray the costs of the equipment, material, or travel associated with research initiatives, including capstone projects, senior theses, and other research projects—even UTRAs. Funding is available for both individual and team collaborations, and includes opportunities for international research projects.

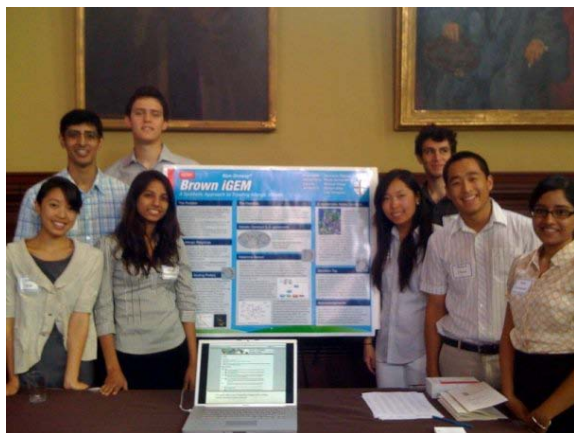
Participating in undergraduate research at Brown may shape a student's career trajectory; an UTRA or a Dean's Fund grant at age 19 could lead to an honors project, a career in research or academia, or to real contributions in the science or humanities. Yet the benefits of a research experience are also more immediate: creating a campus culture of serious, original thought; fostering student confidence and curiosity; and enabling life-changing student-faculty collaborations. At a university that celebrates discovery and free inquiry, undergraduate research is part of what makes Brown "Brown."

Life-Changing Experiences

Since Brown's Campaign for Academic Enrichment began in 2003, undergraduate research projects have shaped many academic careers and provided life-changing experiences. Brown students treasure the rich rewards of these experiences. For example, when Lea Mouallem '08 wondered if there was a way to save the thousands of dollars and several months' time that hospitals spend diagnosing whether a patient has an excess of a specific protein isoform, she obtained an UTRA. With guidance from Professor Anubhav Tripathi, she created an experiment to test the adsorption kinetics of two protein isoforms, and



spent a summer perfecting her protocol. The project kindled in Mouallem a clear-eyed passion for research: “Science is not glamorous, and its accomplishments are not spontaneous and sudden... [I] appreciate every small step forward.”



was awarded a Bronze Medal for their work.

Over forty students competed for a coveted spot on Brown’s I-Gem team this year. Of those forty undergraduates, nine were chosen. These enterprising students spent the spring semester taking a synthetic biology course together, then, with the help of a UTRA grant, worked over the summer designing what they hope will be a new cure for allergies. In short, they created a self-regulating system to treat allergic rhinitis by engineering *Staphylococcus epidermidis* to secrete a histamine binding protein in response to elevated histamine concentrations during an allergic attack. The team

Brown undergraduates, Noble Macfarlane ‘10 and Anand Desai ‘12 spent the summer helping to build a Large Underground Xenon (LUX) detector—a project to detect weakly interacting particles that could give scientists greater insight into the Big Bang explosion believed to have formed the universe. What is interesting about this astrophysics project is that these undergraduates, with help from UTRAs, had the opportunity to contribute to science that was making headlines all summer as they worked. “Far below the Black Hills of South Dakota,” read the AP release, “crews are building the world’s deepest underground science lab at a depth equivalent to more than six Empire State buildings.” The students worked under the direction of Brown professor Rick Gaitskell.

Expanding opportunities for international research lend students’ work a global perspective—from Ethiopia to Macedonia, Spain to American Samoa—and are often the defining experience in a student’s undergraduate years. “I cannot possibly separate my Brown experience from this field experience. The two have been complementary, and the university has been enormously supportive,” attests Caitlin Cohen ’08, MD ’12, who received the first of two Dean’s Fund grants in 2005, when she went to Mali to perform AIDS vaccine research. In Mali, she became interested in how a community organizes around health issues, and received a second Dean’s Fund grant in 2006 to develop the Mali Health Organizing Project (MHOP), which creates homegrown health care



solutions to problems ranging from malaria to nutritional deficiencies. Caitlin, along with fellow Brown students Lindsay Ryan ’06 and Erica Trauba ’08, worked to create a model in which slum residents and Malian government entities, groups that do not traditionally have a good working relationship, invest together in health and development. Today, MHOP is a nonprofit organization focusing on microfinance, health, and women’s empowerment, with many partners in Mali and the United States, and because of her work on

this project, Caitlin Cohen was included in *USA Today's* 2008 All-USA College Academic Team.

Embracing the freedom Brown gives students to direct her/his education, Wilfredo Pérez Jr. '08 used his UTRA to become significantly involved in the teaching process. Perez spent the summer and fall of his senior year working with Adjunct Associate Professor of Anthropology Patricia Symonds to redesign the course "AIDS in International Perspective." Pérez, who will continue his Brown education at the Warren Alpert Medical School, digested twelve texts on issues of HIV/AIDS and used his research with Professor Symonds to help restructure the class syllabus and design new class assignments and discussions. Teaching assistantships help define a student's abilities in new ways: for instance, Pérez's UTRA culminated not in an exam but in an 80-minute lecture on health and human rights that he crafted and delivered to fellow undergraduates in the course.

Chris Tyler '10 obtained a UTRA for work last summer on a humanities project—collaborative dramaturgy in contemporary American theater. His project resulted in some interesting



observations about the nature of comedy which will be put to the test this month when he directs the Sock and Buskin production of "*Doris to Darlene: A Cautionary Valentine*," written by Brown MFA '03 graduate Jordan Harrison, who coincidentally, was the recipient of a graduate fellowship while at Brown. A *Newsday* review of a New York production of the play praised "Harrison's teasing, rapturous chamber opera of a play (that) spins and crackles like a beloved old 78 under a bamboo needle..." *Doris to Darlene*, it went on to say "is that rare thing: a rarefied theatrical experiment that has the glow of pure entertainment and the warmth of a folktale."

Professor Paul Buhle's class, "Theory and Methods of Oral History" is another great example of how the benefits of an UTRA or Dean's Fund grant can continue to resonate in the curriculum even after the awardees have graduated. Beginning in 2003, students in this American Civilization course proposed for their own oral history work a new direction that took them into the streets of



Providence, collecting the stories of counter-culture artists, musicians, writers, performers and activists in Rhode Island. They interviewed, among others, the founder of the area's first African-American acting troupe, the author of the *Dictionary of the Avant Garde*, and the inventor of a medium called Tape Art. With funding in part from two UTRAs, the research project—and the oral history class—have evolved into what Professor Buhle calls "the boldest effort of Brown students to engage the community in this way." Recently, Yesenia Barragan '08, Sarah Bird '07, Fokion Burgess '08, and Nolan Shutler '06 received a group UTRA to create an online museum, Underground Rhode Island; the exhibits, which students in Buhle's future classes will

undoubtedly expand, display their pioneering investigations into the alternative arts and cultures of Brown's home state.

Going Far Beyond the Van Wickle Gates

In the fall of 2008, the University inaugurated the first group of fellows in the Brown International Scholars Program (BISP). These upperclassmen purposefully synthesize their research experiences abroad with their education on campus. Intensive faculty mentoring and seminars help students in this program to intellectualize and deconstruct their travel, and to more deeply probe the challenges and opportunities of international engagement. Here are two of the exceptional BISP research projects planned for the summer of 2009:



- Rashid Syed Hussain '10 is conducting an ethnographic research project on the polio disparity in India, which disproportionately affects the minority Muslim population. Though this disparity has largely been blamed on resistance from clerics and radicals to the polio vaccine in the popular press, Rashid's project seeks to understand the complexity of this problem. With participant observation of the vaccination campaign and the quality of life in Muslim ghettos; and interviews with patients, clerics, and government and health officials, Rashid will synthesize his academic work in Human Biology and Anthropology, to ultimately write a thesis presenting his findings.
- A pre-MD, pre-global Health MPH Development Studies concentrator, the focus of Elizabeth Adler '11 at Brown centers on the socioeconomic, political, and cultural determinants of health. Her interest in improving healthcare for underserved populations will bring her to Nepal, where constraints on access to essential obstetric services severely threaten maternal health. Elizabeth will investigate sustainable interventions to reduce barriers to quality obstetric care. She will focus on the impact of social context—poverty, cultural norms and gender roles, lack of female autonomy, inadequate infrastructure, and the tensions between Western and traditional medicine—in shaping maternal health outcomes.

A Fundraising Priority

Time and again, Brown alumni point to undergraduate research in the lab and in the field, and other creative projects, as the most significant—and innovative—learning they experienced at Brown. And students are not the only ones trumpeting these opportunities. More than 80% of Brown's faculty members have participated in UTRAs or advised students seeking grants from the Dean's Fund; many comment that supporting undergraduate research was a meaningful teaching experience and that students have made vital contributions to their own research.

UTRAs and Dean's Undergraduate Research Funds are awarded on a competitive basis, and the number of bright, inquisitive students seeking funding to realize their ideas continues to grow. In fact, the demand now vastly exceeds the supply. To some extent, this is due to the culture of the school; many students choose Brown precisely for its undergraduate research opportunities, and the university, in turn, actively cultivates these opportunities. Too, many multi-disciplinary concentrations at Brown now require students to complete a capstone project or senior thesis, and

these endeavors often require materials or travel that can be beyond students' means. Currently about 25% of non first-year students are or have been involved in paid research programs at Brown—a large number compared to many of Brown's peers, but far lower than the amount sought by both its students and faculty. In the 2008-2009 academic year, Brown awarded 247 UTRAs. "The goal," says Dean of the College Katherine Bergeron, "is to double that number."

As the university sharpens its commitment to financial aid, its need for strong undergraduate research support also grows. Brown is taking extraordinary steps to attract and retain the most highly qualified and diverse student body, and must likewise ensure that those students have the financial support to participate in research projects. Expanding undergraduate research funding also becomes imperative as Brown's science and public health research continues to garner international attention. Recognizing these areas of need, as well as the ongoing demand in the social sciences and humanities, particularly for semester-long research projects, the University has made undergraduate research one of its highest fundraising priorities.

Dean of the College Katherine Bergeron says: "Brown undergraduates continue to amaze us with their drive, talent, and vision. We owe it to them to increase the resources available for these unique research opportunities."

Making a Difference

Brown's unique curricular flexibility encourages the crossing of traditional boundaries between students and faculty, and between departments and disciplines. Students are free to conduct their own investigations, enlist faculty guidance on student-initiated undertakings, or join a faculty's research team. Neale Mahoney, whose UTRA work combined mathematics, economics, and international studies as he investigated diamond conflicts in Sierra Leone explained, "I was passionate about my subjects because I picked them myself." Borne out of this environment are the undergraduate research opportunities described here. Whether the students act as high-level research or teaching assistants to their faculty mentors, ask these mentors to become collaborators on a student-inspired project, or engage in independent research activities, these opportunities enhance Brown's research profile, course offerings, and undergraduate experience.

