

UNDERGRADUATE RESEARCH at **HUNTER**

Hunter has a thriving – and rapidly growing – culture of undergraduate research that encourages student-faculty interactions, enhances students’ intellectual development and contributes to students’ academic and professional success.

Hunter currently has 15 federally- and privately-funded programs to support student-faculty research. This report presents data on students enrolled in the Raab Presidential Fellows Program, the Undergraduate Research Initiative, and the 13 STEM enrichment programs¹ affiliated with Hunter’s NSF-funded Science Mathematics Opportunities Network (SciMON).

WHO ARE HUNTER’S UNDERGRADUATE RESEARCHERS?

In Spring 2014, 210 Hunter students participated in an undergraduate research program.

- 63% of participants were women, which is comparable to the percentage of women in Hunter’s undergraduate population overall (65%)¹.
- Because most external funding supports undergraduate research in STEM, the majority of Hunter students who conducted research major in the natural sciences (65%).
- Internal funding via the Raab Presidential Fellows Program and Hunter’s Undergraduate Research Initiative provides opportunities for students majoring in the social sciences and humanities to participate in research.

Many of Hunter’s STEM research and mentoring programs are designed to increase the participation of groups often underrepresented in science, including racial/ethnic minorities.

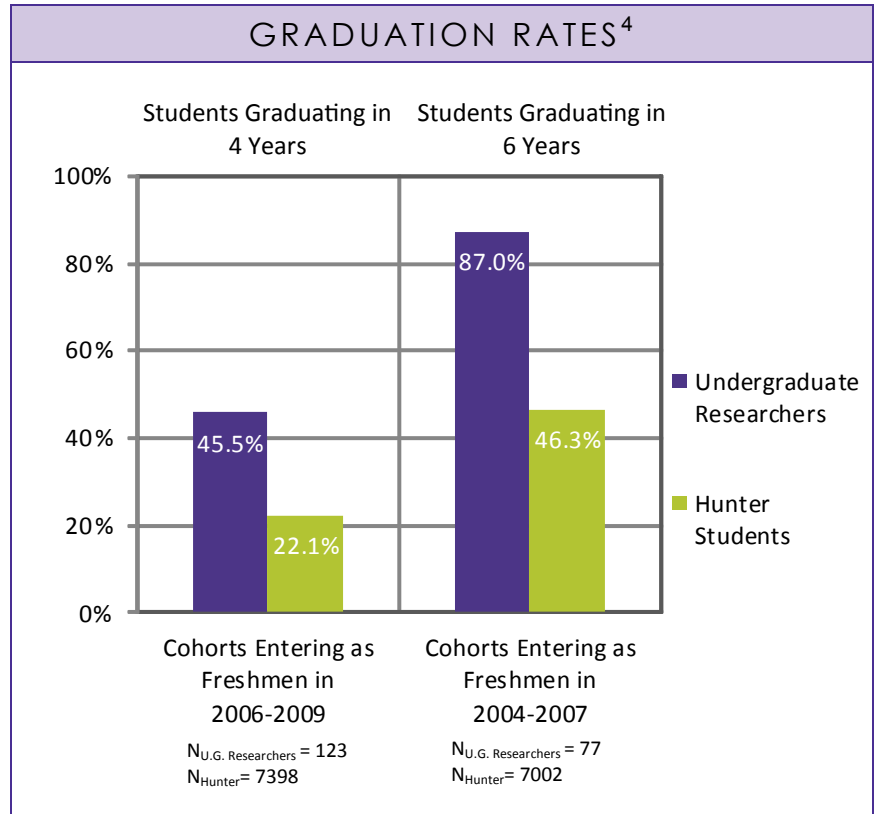
- While Black students are traditionally underrepresented in the sciences (NSF, 2013), **at Hunter**, 17% of undergraduate researchers in STEM are Black, compared to 12% of Hunter students overall³.

HUNTER’S UNDERGRADUATE RESEARCHERS ²	
Gender	Major
<p>63% Women 37% Men</p>	<p>65% Natural Sciences 27% Social Sciences 4% Humanities 4% Undeclared</p>
N = 210	N = 210
STEM DISCIPLINES: RACE ³	
Undergraduate Researchers Majoring in STEM	Hunter STEM Majors
<p>34% White 17% Black 32% Asian 18% Hispanic/Latino(a) 1% Other</p>	<p>34% White 12% Black 35% Asian 18% Hispanic/Latino(a) <1% Other</p>
N = 187	N = 4,497

HOW ARE HUNTER'S UNDERGRADUATE RESEARCHERS DOING?

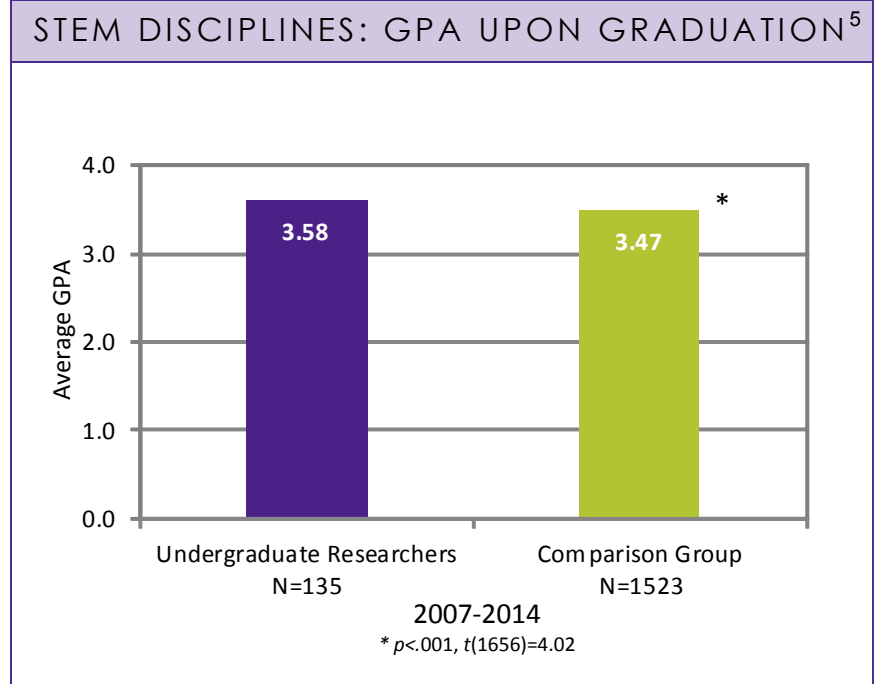
Engaged forms of learning, including undergraduate research experiences, are correlated with higher graduation rates (Lopatto, 2004; Osborn & Karukstis, 2009).

At Hunter: For cohorts entering as freshmen between 2004 and 2009, the four-year and six-year graduation rates of undergraduate researchers (45.5% and 87.0%, respectively) are higher than for Hunter's undergraduate student body overall (22.1% and 46.3%, respectively).



Undergraduate research experiences have also been linked to higher grade point averages (Eagan, et al., 2013; Osborn & Karukstis, 2009; Sadler & McKinney, 2010).

At Hunter: Among Hunter's STEM majors, undergraduate researchers graduate with significantly higher GPAs, on average, than students in Hunter's general population (3.58 vs. 3.47, respectively).



WHAT HAVE HUNTER'S UNDERGRADUATE RESEARCHERS ACCOMPLISHED?

There are numerous additional benefits for students who conduct research as undergraduates, including the possibility of publishing their work (Seymour et al., 2004).

At Hunter: Students who participate in undergraduate research have published their work in top peer-reviewed journals in areas including bioinformatics, chemistry, genetics, medicine, nutrition, and psychology.

Students who participate in research as undergraduates report higher enrollment in graduate programs (Bauer & Bennett, 2003; Lopatto, 2004).

At Hunter: Many undergraduate researchers go on to top professional and graduate programs, including doctoral programs at some of the best research universities in the country. Hunter's undergraduate researchers have pursued:

- PhDs in the sciences, social sciences and humanities
- Professional degrees in medicine (MD, DO and MD/PhD), pharmacy (PharmD), law (JD), dentistry (DDS), and veterinary medicine (DVM)
- Master's degrees in fields including computer science, education, geography, mathematics, physics, public health, and social work.

PUBLICATIONS⁶

Hunter's undergraduate researchers have published in journals including:



British Journal of Sports Medicine
BMC Genomics
Cancer
Journal of Adolescence
Journal of Anxiety Disorders
Journal of Cell Science
Journal of Neuroscience
Nature
Obstetrics and Gynecology
PLoS ONE
Psychopharmacology

GRADUATE SCHOOL ACCEPTANCES⁷

Hunter's undergraduate researchers have been accepted to top graduate and professional schools including:

Brown University
Carnegie Mellon University
Columbia University
Cornell University
Harvard University
Icahn School of Medicine at Mount Sinai
Johns Hopkins University
Massachusetts Institute of Technology
Memorial Sloan Kettering Cancer Center
New York University
Princeton University
The Rockefeller University
University of California, Berkeley
University of Chicago
University of Michigan
University of Rochester
Weill Cornell Medical College
Yale University



WHAT ARE STUDENTS SAYING ABOUT UNDERGRADUATE RESEARCH?

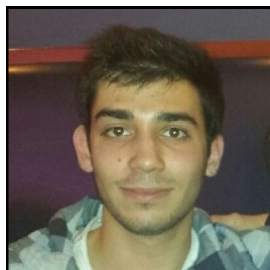
STUDENT STORIES



My research experiences have taught me a variety of skills that have helped me in other areas of my academic life. I have developed a variety of computational skills that I now use regularly for my schoolwork. Research helped me understand when I am best productive and how I

can stay on track with the "big picture" of my project. These time management and productivity skills have helped me to also become more productive beyond my research/academic responsibilities.

Munazza Alam, Physics Major, Class of 2016



My program really helped me ensure that I excel in my field by exposing me to opportunities such as re-search and internships. I have also made exceptional relationships with professors, and my program has given me direction to excel in all my future endeavors.

I'm now determined to go to graduate school, confident in applying to any program, and determined to take any extraordinary opportunity that is presented.

Jonathan Galsurkar, Math & Computer Science Major, Class of 2016

REFERENCES

- Bauer, K. W., & Bennett, J. S. (2003). Alumni perceptions used to assess undergraduate research experience. *The Journal of Higher Education*, 74(2), 210-230.
- Eagan, M. K., Hurtado, S., Chang, M. J., Garcia, G. A., Herrera, F. A., & Garibay, J. C. (2013). Making a difference in science education the impact of undergraduate research programs. *American Educational Research Journal*, 50(4), 683-713.
- Lopatto, D. (2004). Survey of undergraduate research experiences (SURE): first findings. *Cell biology education*, 3(4), 270-277.
- National Science Foundation, National Center for Science and Engineering Statistics. (2013). *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2013*. Special Report NSF 13-304. Arlington, VA. Available at <http://www.nsf.gov/statistics/wmpd/>.
- Osborn, J. M. & Karukstis, K. K. (2009). The benefits of undergraduate research, scholarship, and creative activity. In: M. Boyd and J. Wesemann (Eds.), Pages 41-53, *Broadening Participation in Undergraduate Research: Fostering Excellence and Enhancing the Impact*. Council on Undergraduate Research, Washington, DC.
- Sadler, T. D., & McKinney, L. (2010). Scientific Research for Undergraduate Students: A Review of the Literature. *Journal of College Science Teaching*, 39(5), 43-49.
- Seymour, E., Hunter, A. B., Laursen, S. L., & DeAntoni, T. (2004). Establishing the benefits of research experiences for undergraduates in the sciences: First findings from a three-year study. *Science Education*, 88(4), 493-534.

NOTES AND DEFINITIONS

- ¹ The 13 STEM enrichment programs include: AstroCom NYC, BP-ENDURE, Catalyst, HHMI, LSAMP, MARC, MBRS-RISE, McNair, McNulty Scholars, MIND Alliance, MMUF, QuBi, and Raise-W.
- ² Hunter's Undergraduate Researchers are defined as students who are active in any of the research programs as of spring, 2014. Psychology was coded as a social science, with the exception of neuropsychology, which was coded as a natural science. Students who have multiple majors were counted multiple times.
- ³ Undergraduate Researchers Majoring in STEM are defined as students who are active in any of the research programs as of spring, 2014 and are majoring in a STEM discipline, including psychology. Data for Hunter STEM Majors (including psychology) were obtained via Hunter's 2013 Factbook and include undergraduate researchers.
- ⁴ Undergraduate Researchers are defined as students who participated in a research or mentoring program at some point in their undergraduate careers and obtained their undergraduate degree by June, 2013. Data for Hunter Students were obtained via Hunter's 2013 Factbook and include undergraduate researchers. 6-year graduation rates for both Undergraduate Researchers and Hunter Students include those who graduated in 4 years.
- ⁵ Undergraduate Researchers are defined as students who participated in a research or mentoring program at some point in their undergraduate careers, majored in a STEM field (including Psychology), and obtained their undergraduate degree between 2007 and 2014. Data for Hunter Students were obtained via CUNYfirst and include undergraduate researchers. T-test analysis was completed using SPSS Statistics 20. The effect size of the t-test (Cohen's $d=.35$) is considered small to moderate. Many of Hunter's research programs require a minimum GPA of 3.0 and many students apply during their sophomore year. Therefore, to control for academic performance, the comparison group of Hunter students' GPAs upon graduation was selected based on the following criteria: undergraduate STEM majors (including Psychology) who had a cumulative GPA of 3.0 or higher as an upper sophomore (45-59.9 credits).
- ⁶ Publication data includes first- or co-authored publications of students while they were enrolled at Hunter and since they have graduated. Data were obtained via faculty, Google Scholar, and LinkedIn; includes data only for those students for whom data are available.
- ⁷ Includes data only for those 157 students for whom data are available, and who were accepted into graduate schools in the United States. Data were obtained from program administrators, faculty, student reports, the Office of Institutional Research, and LinkedIn.