Undergraduate research is well-established as a high-impact educational practice, and is an integral part of the experiential learning landscape at a research-intensive university.

Since 2011, the Undergraduate Research Initiative (URI) has supported the involvement of University of Alberta undergraduate students in research and creative activities. The work of the URI is student-focused, aiming to minimize barriers to undergraduate research by helping students overcome constraints of time, money, confidence, or access to meaningful opportunities. To this end, the URI designed the Undergraduate Researcher Stipend (hereafter URI Stipend) as a funding program with relatively broad eligibility criteria, to facilitate research opportunities for students regardless of discipline, year of study or academic standing.

Here, we summarize applicant data for the URI Stipend from 2012-2020, and outcomes from a qualitative analysis of URI Stipend recipient reports.

**URI Stipend Applicant Statistics (2012-2020)**

Between 2012-2020, the URI Stipend supported 459 students from 14 University of Alberta faculties.

Distribution of URI Stipends awarded by student faculty, 2012-2020 (n=459). "Other" includes faculties with an average of less than one award per year (Pharmacy & Pharmaceutical Sciences, Law, Native Studies, Education, Campus Saint Jean, Business).
The average success rate for the URI Stipend between 2012-2020 was 29%.

Approximately 10% of applicants to the URI Stipend are registered as international students. There is no difference in the success rate for international vs. domestic student applicants to the URI Stipend.
URI Stipend Student Outcomes

To better understand students’ experiences with the URI Stipend, we undertook a qualitative analysis of 20 URI Stipend recipient final reports (selected by maximum variation sampling from students who completed their Stipends between 2016-2020), and identified several themes:

### Professional Socialization

Students highlighted mentorship and networking opportunities as important aspects of their URI Stipend experience, supporting their sense of belonging to the research community and an understanding of professional or disciplinary norms.

“...To complete my project, I had to rely on the generosity of many other people who made reagents and offered guidance on my project. I learned that research often relies on these little collaborations, and part of it is contributing back through various lab jobs such as cleaning, organizing, and making reagents and whatever is needed to make a lab work efficiently.”
— Year 4, Biological Sciences

“...One of the most impactful experiences for me, was speaking with other researchers about their experiences and barriers in their own research, and being able give each other ideas when support was needed.”
— Year 3, Education

### Interdisciplinarity

URI Stipend recipients expressed both appreciation for interdisciplinary research as an approach that brings together different perspectives toward a common goal, as well as some of the challenges associated with collaborating and integrating knowledge across disciplines.
“Interdisciplinarity played a huge role in my project. I spoke with many professors and students, particularly in the Agricultural/BioSci departments, that I would normally never have interacted with in my regular degree. I learned how valuable it is to converse with members of varying schools of knowledge to maximize the outcome of a project. I knew nothing about plants, farming, and sustainable agriculture, but through this project and speaking to others, I’ve learned so much!”

— Year >4, Mechanical Biomedical Engineering

“This process allowed me to conduct research outside of my area of knowledge. Originally I assumed interdisciplinary work involved groups contributing only in their area of expertise. My experience was very collaborative in that I worked with Information Services Technology to help develop code, even though they had much more expertise in the area. I am extremely pleased to have learned the value of interdisciplinary research through my URI research project.”

— Year >4, Kinesiology, Sport and Recreation

**Learning Outcomes**

URI Stipend recipients developed a variety of technical/discipline-specific and transferable skills, including communication, time management, conflict resolution, and interpersonal/teamwork skills. Students expressed both the benefits and challenges of a greater degree of independence afforded by undergraduate research, as well as the need for resilience in light of the unpredictable nature of the research process. The transferable skills identified by students align closely with career readiness competencies, and students recognized the importance of these skills for their future careers.

“I believe all research skills that I’ve learned over the course of the summer will be applicable within academia as I go forward into my graduate and doctorate degrees. Beyond further education, these hands-on skills will be essential in effective interpersonal community work.”

— Year 3, Sociology
“I got a much clearer picture of what research in the field is actually like, right from developing my own questions, to getting ethics approval and now collecting my own data.”
— Year 3, Biological Sciences

“...by overcoming multiple challenges over the course of the project I have shown drive and adaptability and increased my capability to face similar adversities in the future.”
— Year 2, Animal Health

Teaching-Research Nexus

URI Stipend recipients described complementary connections between their classroom learning and research experiences, including application of their classroom learning to research, and research providing helpful preparation and context for advanced classes. Students also articulated their enjoyment of independent and creative research over classroom learning.

“I was surprised by the base of knowledge that I already had from my university courses. Psychology sometimes has the reputation of being a field where “real” knowledge is only imparted come one’s Master’s or PhD. However, my courses gave me many of the rudiments necessary to delve deeper into subjects such as psychopharmacology or pediatric psychopathology. This was exciting to discover, as it told me that I chose a degree that not only fascinates and inspires me, but also will serve me in my future career opportunities.”
— Year 2, Psychology

“I was taking a cell biology class in which we were learning how to study proteins. I better understood the lecture material since I had already done many of the procedures in the lab. In turn, this allowed me to better understand why certain solutions are added and things are done in the lab. Both the lecture and my research experiments complemented each other well, and I felt lucky to physically carry out the processes learned in class.”
— Year 2, Biological Sciences
Better Understanding of Self

URI Stipend recipients described having increased confidence, increased understanding of their potential capabilities, and a deepened sense of purpose or motivation based on the broader impact of their research. Students also highlighted their individual likes and dislikes about the research process, which provided insight into themselves as learners. Some students indicated a need for more support to combat social isolation of research, particularly in environments where students work independently rather than in teams.

“It has really shown me what I am capable of as a student and what I lack and can improve upon as I continue on with my undergraduate degree.”
— Year 1, Philosophy

“Many people view university and other institutions as disconnected from community, but in my experience this summer, I was able to experience firsthand the ways in which the knowledge we acquire at university can go a long way to build stronger communities.”
— Year 3, Education

Impact on Future Plans

URI Stipend recipients recognized the value of hands-on research experience as an opportunity to explore and clarify career options. Whether their research experience confirmed their career intentions or caused them to question or shift their future plans, students recognized the skills gained through their Stipend experience as supporting their future career goals.

“This opportunity gave me hands-on experience with research and not only introduced me to the academia setting, but also highlighted a potential career path that I never anticipated I would want to pursue.”
— Year 2, Philosophy
URI Stipend recipients also expressed appreciation for the broad eligibility criteria for the URI Stipend, particularly the relaxed GPA requirement, which is otherwise a barrier to research for many students.

“I’m not sure exactly what my next steps are, but whether I go to grad school or pursue some other career in a history-related field, these skills are invaluable.”
— Year >4, Sociology

“This experience made me question my current career path in psychology and was part of the reason as to why I applied to a different program—engineering. Whether I really change programs, that’s a different story, but it opened my eyes to considering academia and research as a potential career path.”
— Year 2, Psychology

**Overall Impressions of the URI Stipend experience**

Overall, students described the URI Stipend experience as having significant impacts on their academic and career goals, and contributing to their enjoyment of their student life at the University of Alberta.

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“This research has meant the world to me: I have been able to pursue this amazing opportunity that has given me a solid direction in my studies and wonderful experience...”
— Year 4, Sociology
“Many times, and especially in many other universities in the world, undergraduates do not get such a chance to carry out such research experience, and as a result, U of A is an exceptional university in that regard and it is all thanks to the funding opportunities that exist.”

— Year >4, Biological Sciences

“The URI experience has contributed immensely to both my success and enjoyment as an undergraduate at the University of Alberta, and has provided me with a summer experience I will always remember.”

— Year 1, Kinesiology, Sport & Recreation

Supporting students’ career development through undergraduate research

This evaluation highlights the value of undergraduate research for students’ career development, regardless of their particular career intentions at the time they undertake their research experience. A follow-up study is currently underway to examine longer-term (i.e. post-graduation) academic and career impacts of the URI Stipend for alumni.

Undergraduate research confers a variety of academic, social, and career readiness benefits for students. The URI, by virtue of its administrative relationship with the Career Centre, embeds career development principles throughout its programming to support students in gaining the knowledge, skills, connections, and experiences to advance their career goals.

The current emphasis on experiential learning and career readiness for post-secondary students provides an opportunity to showcase undergraduate research as a form of experiential learning unique to research-intensive universities, with similar benefits to work experience, internships, co-op, and work-integrated learning.

The URI is grateful to Simrit Deol (PhD student in Kinesiology, Sport & Recreation) for her major role in analyzing the data and in writing the report. For the full report, and more information about the URI Stipend, visit www.uab.ca/uri