



# Strategic Plan Summer 2025

# Undergraduate Research Opportunities Program

# Contents

03

**Introduction**

06

**Methodology**

07

**Literature Review**

10

**SWOT Summary**

13

**Strategic Themes**

24

**Acknowledgments**

# Introduction

## UROP's Origins

In 1957, Edwin H. Land was invited to MIT to give a lecture on what he saw as the Institute's greatest opportunity. In "Generations of Greatness," Land, a cofounder of the Polaroid Corporation, argued that all newly arriving students should start "at once" on their own research projects. This was how MIT could preserve each student's "secret dream of greatness and make it come true," he said. Students and faculty should work together to create situations where scientific discovery was "not simply an opportunity for greatness for a few, but an opportunity for greatness for the many."

In 1969, buoyed by a \$50,000 grant from Land and guided by the vision of physics instructor Margaret MacVicar (who would later serve as Dean for Undergraduate Education), MIT formally launched the Undergraduate Research Opportunities Program (UROP). While students have almost certainly been working with faculty on research since the earliest days of post-secondary education, MIT was among the very first universities to formalize a program that pairs undergraduates with active faculty research projects. (Caltech's Summer Undergraduate Research Fellowship program was established 1979, and the University of Michigan's Undergraduate Research Opportunity Program launched in 1988.)

Over the last six decades, UROP has grown into a cornerstone of MIT's educational experience—directly engaging 93% of undergraduates and 58% of faculty. Today, formal undergraduate research programs are thriving at colleges and universities across the United States and around the world—many of them explicitly modeling themselves on MIT's example.

## Simplicity And Flexibility

The structure of a UROP has remained largely unchanged since 1969. A project must meet just two criteria: an MIT faculty member (or other approved researcher) must endorse and agree to supervise a student's research proposal, and the work must have educational value for the student.

All UROPs are co-created by students and MIT faculty or other approved researchers. Together, a student and a mentor (Land referred to them as "ushers—someone who leads you through the door") define a project's scope, duration, and deliverables. Students then apply for a UROP and formalize their participation on a term-by-term basis; whether a project continues beyond one academic term or a summer session is mutually decided by the student and their mentor.

One of UROP's hallmarks is its flexibility. Students from any discipline can participate at any stage of their undergraduate careers. They are not confined to research projects within their area of study, and proposals are not limited to particular fields or disciplines. Students can UROP for academic credit or for pay, with funding provided by both the central UROP office ("direct funding") or from funds managed by faculty, departments, or other sources ("sponsored funding"). UROPs can happen at any time of year—during the academic term, summer, and Independent Activities Period (IAP).



## Outcomes

Edwin Land's notion that every student entering MIT harbored a "secret dream of greatness"—and that engaging in mentored research was a path to realizing this dream—has been utterly validated by UROP's sustained and spectacular success among MIT undergraduates. MIT students and alumni consistently note UROP's important role in their learning experience at MIT.

UROPs empower students. They acquire tangible skills—how to operate equipment, run experiments, collect data, analyze results, communicate their results, make presentations, and more. They gain concrete experiences that help them prepare for their own professional futures—team dynamics, lab politics and administration, mentoring, the academic publication process, and more. And UROPs broaden students' minds and deepen their confidence—they learn how to develop and refine their own ideas, how to move ideas forward and think like seasoned scientists, and how to work independently. When asked about their experience doing a UROP, 82% note they were satisfied or very satisfied.

MIT faculty are almost as enthusiastic in their support. Nearly 60% are regularly engaged with the program. When surveyed, more than half of faculty report working with UROPs for two or more terms every year, and 80% find the experience of mentoring undergraduates on research projects rewarding for themselves and for the other members of their research groups. For their part, 94% of participating students find their UROP mentors treat them fairly and with respect. (All data is for AY25)



## Planning Context And Trends

Despite its rich history, UROP has never before engaged in a strategic planning process. In summer 2024, with new leadership on the horizon in the Division of Graduate and Undergraduate Education (which oversees UROP as part of the Office of Experiential Learning), the UROP leadership team set out to better understand their program, survey stakeholders, consult peer programs, and look broadly at the program's overall health and effectiveness.

The changes UROP leadership and staff had noticed and wanted to understand more thoroughly included:

- ▶ **A doubling in student participation since 2005.**
- ▶ **Since 2015: a steady increase in students opting for pay over academic credit—accompanied by a 79% increase in UROP applications seeking direct funding from central sources (over the same period).**
- ▶ **A noticeable increase in students UROPing virtually (e.g., not physically present in the lab) since the pandemic.**

The program's leadership initiated a broadly consultative process to gain insight and make a plan for UROP's future. It is worth noting that the planning period for this report corresponded with dramatic changes in national conversations about higher education and U.S. government funding for academic research. The resulting impacts and outcomes remain unclear, but AY25 turned out to be an auspicious time to look closely at the program, assess its performance, and calibrate it for a still-uncertain future.



## Data Points (AY25)

# 93%

of undergraduates participated in UROP at least once before graduation

# 82%

of UROP participants are satisfied or very satisfied with their experience

# 58%

of faculty have mentored one or more UROPs

# ▶ 7,846

UROP applications were submitted by 3,377 students

# ▶ 6,626

applications were approved

# ▶ 65%

of undergraduates participated

# ▶ 73%

of first-year students participated

# \$16.8M

MIT committed \$16.8M to undergraduates engaged in UROP, with \$7.6M (45%) allocated directly by the UROP Office—making it (by far) the largest experiential learning program at the Institute.

# 77%

of UROP projects were paid, 22% earned academic credit, and 1% volunteered.

(Note: The volunteer option was eliminated in January 2025.)





# Methodology

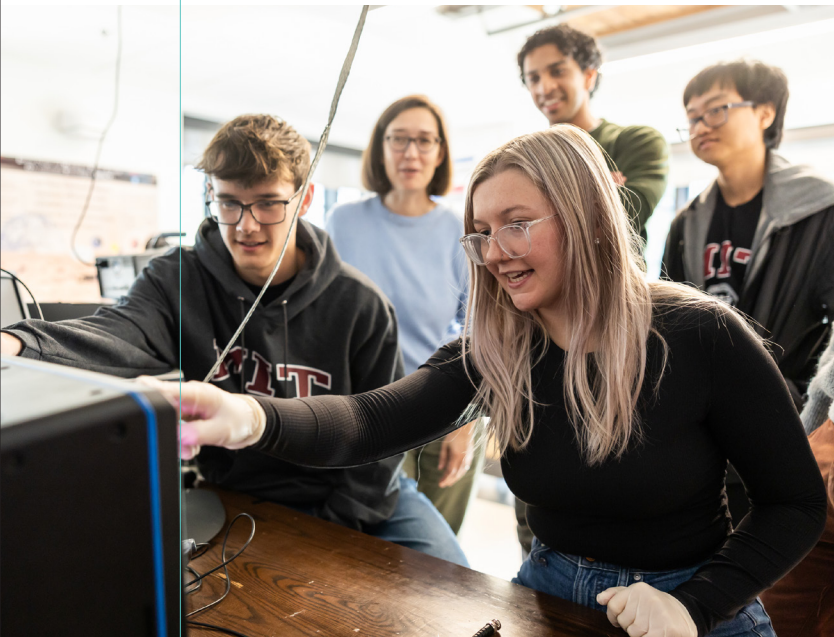
UROP's strategic planning started in summer 2024. The program engaged in a broadly consultative planning process, seeking input from multiple stake holders—undergraduate and graduate students, faculty, postdocs, administrators, peer schools and programs—in order to understand a broad range of perspectives and experiences. Their goals were to learn what is working effectively with UROP, what is not working, what can be improved, and how it can be improved. Specifically, UROP leadership:

- **Convened a 16-person advisory group** made up of faculty, staff, and graduate and undergraduate students; this group met four times across the planning period, provided critical guidance and served as a sounding board on the plan, reviewed survey instruments, and participated in a (strengths, weaknesses, opportunities, threats) **SWOT analysis**.
- **Conducted a literature review** to synthesize relevant knowledge and best practices.
- **Consulted with peer institutions**, including undergraduate research colleagues at Harvard, Stanford, Caltech, the University of Michigan, and the University of Washington; the UROP Director also attended the IvyPlus Undergraduate Research meeting in January 2025.
- **Met with the Deans of MIT's Schools and College**, as well as with Science and Engineering Councils; **interviewed internal partner programs**, including Career Advising & Professional Development (CAPD), the Teaching + Learning Lab (TLL), D-Lab, and the Gordon Engineering Leadership Program (GEL); and met with members of the Undergraduate Association, Graduate Student Council, and Postdoctoral Association.
- **Surveyed all MIT undergraduates and faculty members:**
  - [UROP Undergraduate Students Survey \(October 2024\)](#)
  - [UROP Faculty Survey \(March 2025\)](#)

# Literature Review

Existing peer-reviewed research shows a strong association between undergraduate research experiences and positive academic and career outcomes. Studies show links to increased graduate program enrollment, stronger self-efficacy, improved academic performance, and shorter time to graduation, especially for those students who participate in multiple research experiences. These experiences support skill development and often lead to personal growth, scholarly output, or advanced study.

Research shows mentorship's critical role in undergraduate research. Positive mentor-mentee relationships and supportive lab environments reduce stress and anxiety, are self-reinforcing, and lead to increases in persistence. The most effective mentoring includes intellectual, emotional, and professional support and is most often available to students who engage in research over multiple semesters and with multiple types of mentors.



## Overall Value

- Weidman et al. (2024) found that students, faculty, and the literature have different definitions of what “successful” undergraduate research entails. Outcomes characterizing success can include attending graduate school, developing research skills, producing presentations or publications, and experiencing concurrent academic benefits such as a higher GPA. Faber et al. (2020) similarly found that engineering students viewed making novel discoveries, disseminating findings, and integrating findings into a larger societal or scientific context as characteristics of successful research.
- In a 2017 report from the National Academies of Sciences, Engineering, and Medicine, the authors found that most existing studies on undergraduate research were either descriptive case studies or used correlational designs, making it difficult to draw conclusions about the effects of undergraduate research. However, they noted that the available information suggested that undergraduate research experiences “may be beneficial for students due to their potential to improve participation and retention of students in STEM majors, as well as improving students' knowledge of career options, experimental design, and related disciplinary thinking” (NASEM, 2024, p. 120).
- In a quasi-experimental study of participants in the California State University (CSU) system's Louis Stokes Alliance for Minority Participation (CSU-LSAMP), Barker et al. (2023) found that participation in undergraduate research was strongly associated with post-baccalaureate enrollment and graduation in STEM disciplines among students from underrepresented backgrounds.



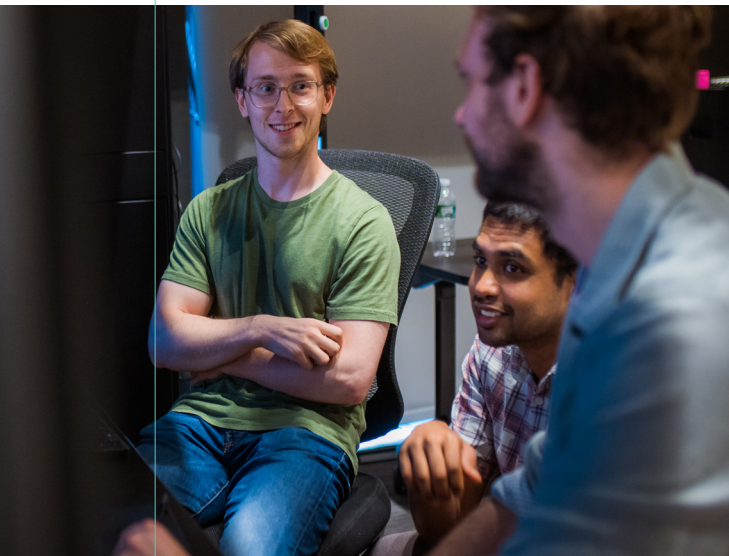
## Multiple Experiences

- Dominguez and Darrah (2024) found that student self-efficacy and STEM belonging were significantly higher for students who had had multiple undergraduate research experiences compared to their peers with only one experience.
- In a quasi-experimental study, Chamely-Wiik et al. (2023) compared “experienced” undergraduate researchers (those with 3-plus semesters of research participation) to “novice” undergraduate researchers (one to two semesters of participation) and control students (non-participants) and found that experienced students had significantly higher graduating GPAs than novice or control students. Both experienced and novice students had a shorter time to graduation than control students, and experienced students were also significantly more likely to pursue a graduate degree.



## Mentorship

- Research mentors can offer varying kinds of support, including intellectual, personal/emotional, and professional. Ceyhan and Tillotson (2020) found that the types of support commonly offered can depend on the types of mentors, with graduate student and postdoctoral mentors generally focused on intellectual support (e.g., guidance on technical skills relevant to the research), and faculty members more likely to provide personal/emotional and professional mentoring. In their study, only students with both a graduate/postdoctoral mentor and a faculty mentor, as well as those who participated in research for three or more semesters received all three types of mentoring. This reinforced the importance of participating for multiple semesters while also highlighting the value of multiple types of mentors.
- In a study of researchers who had won awards for mentoring undergraduate researchers, Walkington et al. (2020) noted that successful mentors carefully balance a need to control research topics and outcomes with a desire to create opportunities for undergraduates to exercise freedom and creativity. Successful mentors also calibrate the level of challenge to keep students engaged and help them experience a sense of achievement.



- In a study of mentoring practices used by faculty with novice undergraduate researchers (first and second-year or transfer students lacking research experience), faculty interviewees noted that working with novices is rewarding due to their enthusiasm and potential for long-term participation. That said, the faculty noted that people mentoring novices must be prepared for students to decide that the lab or research in general is not a good fit. They also noted that novices may be uncomfortable with the intellectual risk-taking and frequent failures necessary to the research process, and mentors need to help students develop comfort with failure. “The interviewees universally viewed students’ disengagement or disappearance as the only form of unproductive failure arising from [undergraduate research]” (Greer & Lester, 2025, Supportive Measures section).
- Cooper et al. (2023) found that a positive lab environment and mentor-mentee relationships decreased research anxiety, whereas experiencing failure or feeling underprepared increased research anxiety. They noted that women and students with higher GPAs were more likely to report higher levels of research anxiety compared with men and students with lower GPAs, and that students with higher research anxiety were less likely to pursue a research-related career.

## References

- Barker, D. C., Messier, V., Marcotte, D. E., Hammersley, L., & Quiñones-Soto, S. (2023). Undergraduate research experience and post-graduate achievement among students from underrepresented groups in STEM. *Journal for STEM Education Research*, 7(2), 257–280. <https://doi.org/10.1007/s41979-023-00107-8>
- Ceyhan, G. D., & Tillotson, J. W. (2020). Mentoring structures and the types of support provided to early-year undergraduate researchers. *CBE—Life Sciences Education*, 19(3). <https://doi.org/10.1187/cbe.19-09-0183>
- Chamely-Wiik, D., Ambrosio, A., Baker, T., Ghannes, A., & Soberon, J. (2023). Impact of undergraduate research experience intensity on measures of student success. *Journal of the Scholarship of Teaching and Learning*, 23(1). <https://doi.org/10.14434/josotl.v23i1.32675>
- Cooper, K. M., Eddy, S. L., & Brownell, S. E. (2023). Research anxiety predicts undergraduates’ intentions to pursue scientific research careers. *CBE—Life Sciences Education*, 22(1). <https://doi.org/10.1187/cbe.22-02-0022>
- Dominguez, K., & Darrah, M. (2024). The impact of multiple research experiences on undergraduate students. *Research in Higher Education*, 45. <https://eric.ed.gov/?id=EJ1444112>
- Faber, C. J., Kajfez, R. L., McAlister, A. M., Ehler, K. M., Lee, D. M., Kennedy, M. S., & Benson, L. C. (2020). Undergraduate engineering students’ perceptions of research and researchers. *Journal of Engineering Education*, 109(4), 780–800. <https://doi.org/10.1002/jee.20359>
- Greer, J., & Lester, A. (2025). Mentoring novice undergraduate researchers: Faculty perceptions and salient practices. *Innovative Higher Education*. <https://doi.org/10.1007/s10755-025-09789-x>
- National Academies of Sciences, Engineering, and Medicine. (2017). *Undergraduate Research Experiences for STEM Students: Successes, Challenges, and Opportunities*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24622>
- Walkington, H., Stewart, K. A., Hall, E. E., Ackley, E., & Shanahan, J. O. (2019). Salient practices of award-winning undergraduate research mentors – Balancing freedom and control to achieve excellence. *Studies in Higher Education*, 45(7), 1519–1532. <https://doi.org/10.1080/03075079.2019.1637838>
- Weidman, A., Parham, A., Fisher, M. H., & Wilhelm, J. (2024). Measuring student success and outcomes in undergraduate research programs. *Scholarship and Practice of Undergraduate Research*, 8(1), 33–42. <https://doi.org/10.18833/spur/8/1/6>



# SWOT Summary

## ▲ Strengths

### AWARENESS AND PARTICIPATION

- Deeply embedded in the research-oriented culture of MIT—93% of undergraduates and 58% of faculty participate
- A draw for applicants and incoming students—most are aware of the program before they come to campus

### EDUCATIONAL EXPERIENCE

- Intellectual and professional exploration—*mens*
- Hands-on experience and application of classroom learning—*manus*

### FLEXIBILITY

- Students can UROP at any point in their undergraduate careers and any time of year (fall, IAP, spring, summer), in any discipline or department
- Compensation: hourly wage or academic credit
- Direct funding or sponsored funding (from departmental or faculty sources)

### FUNDING MODEL

- Substantial central funding pool provides support for new or not-yet-sponsored ideas, and it enables participation from departments that receive less support from external sources
- Option for financial compensation levels the playing field for students with financial need, providing high-value alternative to other work-study options

### MENTORING AND RELATIONSHIPS

- Regular, direct engagement between undergraduate students and a wide range of researchers (e.g., faculty, grad students, postdocs, research scientists)
- One-on-one research mentoring by faculty is a qualitatively different interaction from the classroom

### INNOVATIVE MODEL

- Internal catalyst for new ideas and refinements—department-specific and “UROP+” models (SuperUROP, mini-UROP, First-Year Pre-Orientation Program)
- Institutional leadership—UROP-inspired programs at other universities

## ▼ Weaknesses

### FINDING AND APPLYING FOR A UROP

- For students seeking to join existing research projects, MIT lacks a comprehensive inventory of ongoing activities
- Intimidating for students to reach out to faculty
- Antiquated application, tracking, and communication systems
- Time-intensive processes—from looking for positions to getting faculty approval to securing or negotiating funding—can be stressful for students, faculty, and UROP staff; disproportionate impact on first-time UROPers

### STRUCTURE, SUPERVISION, AND SUPPORT

- Inconsistent onboarding or training for students
- Lack of direct interaction with faculty
- Not enough interaction with research staff (graduate student or postdoc supervisors)
- Inadequate support for students and faculty or research staff who are experiencing interpersonal conflict
- Misaligned expectations between students and mentors (time commitment, project goals, standards of work, etc.)



## ■ Opportunities

### COMPENSATION MODELS AND PRACTICES

- Hybrid pay/credit UROPs
- Incentives for project continuation to advance students from novice to experienced

### TRAINING

- More research mentorship training
- UROP onboarding and orientation framework and resources for all research mentors
- Supervisor and student training on setting expectations and managing conflict
- Structured, regular, in-person pre-professional training and workplace acculturation

### FEEDBACK, EVALUATION, AND OUTCOMES

- Improved communication with and feedback to mentors about student experiences
- Post-UROP reflection exercises or workshops
- Publicize UROP student evaluations of their UROP experiences (similar to Hydrant: evaluation scores, hours worked, general climate, etc.)

### PROGRAM INNOVATIONS

- Exploratory “UROP-lite” models as training or trial periods
- Curricular integration (departmental/major requirements)
- Digital portfolios
- Formal Course-based Research Experiences (CUREs) to provide more cohort-based and entry-level opportunities, training, and integrated pipelines

## ◆ Threats

### FUNDING

- Potential reductions in federal research grant funding
- Increased program demand without increased funding

### STUDENT EXPERIENCE

- Potential reductions in student research opportunities
- Increasing pressure on faculty time, attention, and resources
- Intensifying student burnout and time-management challenges
- Increase in first-year participation and pressure to UROP “right away!”
- Increase in virtual work impedes some types of learning and personal connections between students, mentors, and the research community

### COMPETITION

- Student time and attention are limited, but there is a perceived need to optimize every decision—is exploration still valued?
- Increasing competition from internships





# Strategic Themes

To maintain the program's excellence, high participation rates, financial sustainability, and MIT's institutional leadership in the undergraduate research field, the planning team identified five strategic themes:

**01 Funding**

**04 Best Practices**

**02 Process**

**05 Access**

**03 Mentoring**



# 01 Funding

In an era of profound financial uncertainty for MIT and high demand for research experiences, what principles should guide UROP's allocation of direct funding?

- **UROP is MIT's largest experiential learning program.** UROP works on a model where central or "direct funding" can support students working on projects that are not funded by other internal sources. The program awarded \$16.8M in AY25: \$7.6M from direct funding and \$9.2M from funds controlled by faculty members and DLCs ("sponsored funding").
- **Demand for direct funding now outstrips supply.** Over the past 10 years, the percentage of UROPs opting for pay has increased from 67% to 77% (with a commensurate decline in those seeking academic credit). Since 2015, demand for direct funding has increased by 146% while available funding has increased by 71%.
- Based on survey results, faculty express a preference for prioritizing funding for **first-time UROPs and for students with financial need**. MIT already guarantees MIT scholarship recipients one paid UROP semester during their undergraduate career.
- **Financially, UROP is both well-positioned and potentially vulnerable.** Five decades of grateful and generous MIT alumni and the Institute's own investments have yielded a sizable and solid base of financial support for paid UROPs. The current fiscal outlook for MIT—and for higher education research operations across the U.S. —is putting significant pressure on the Institute and individual faculty members and may over time impact UROP as well.

## GOALS

- ▶ Address the growing demand for funding, including direct funding, sponsored funding, and funding alternatives (e.g., credit).
- ▶ Clarify principles that guide UROP's allocation of direct funding.



## RECOMMENDATIONS

- Prioritize students with financial need and first-time UROPs.
- Increase the number of students who UROP for academic credit: explore making academic credit options more attractive, including discussions of integration into the curriculum, allowing UROP to satisfy certain requirements (like CI-M), credit limits, and grading policies.
- Report regularly to schools and departments on local UROP funding and participation.
- Reinforce the importance of sponsored funding with high-level messaging to faculty.
- Ongoing fundraising to attract more resources (via capital campaign and in concert with Institute priorities like HEALS, Climate Project, etc.).



# 02 Process

What improvements to existing processes, practices, and systems would make a difference in the UROP experience for students and faculty?

- **As a central office serving a very large, complex, and decentralized campus, UROP faces unique operational challenges.** UROP has an application process where students can initiate ideas, either independently or in collaboration with a faculty member, but other stakeholders have to review, endorse, or approve each application, including departmental UROP coordinators, principal investigators, and UROP staff.
- **UROP's technology is outdated.** The current UROP application system was custom-built in 2005 and is no longer meeting UROP's business needs or the expectations of student and faculty end-users. The system's lack of adaptability impedes changes that would add significant functionality and improve efficiency.
- **Increases in regulatory, compliance, and legal requirements** have amplified the system's limitations. These include intellectual property, conflict of interest, off-campus and international UROPs, high-risk travel, international student participation, and more.
- **Time-consuming and labor-intensive workarounds** are often the only methods to address compliance requirements, communicate application deadlines and decisions, reach out to faculty and grad student mentors, and facilitate other administrative processes. The **growing volume of work** adds to the challenge: UROP participation has doubled since the current system was launched.
- Students report that **finding and applying for a UROP can be challenging.** The Experiential Learning Exchange, or ELx, is a centralized inventory of existing research (and other) projects at MIT. It is intended to facilitate UROP applications, but it isn't comprehensive. When asked how they found their first UROP, 35% of students found it through ELx, compared to 51% who approached faculty directly. ([See Access. p.22](#))







## GOALS

- **Adopt new systems and practices that are more nimble, streamlined, and efficient to improve the UROP experience for students and faculty.**

## RECOMMENDATIONS

- Adopt a new UROP application and reporting system that meets current and future needs and the expectations of students, faculty, and administrators.
- Audit existing administrative processes and practices and gather user input; adjust and streamline workflows to accelerate funding decisions, application approvals, faculty negotiations, location verification and remote appointment review, etc.
- Improve integration with systems that support active UROPs: payroll, finance, ELx, Stellic, and the MIT travel registry.
- Establish plan for more regular interactions with faculty and DLCs to solicit their input, share best practices, and broadcast process changes.
- Promote wider adoption and utilization of ELx among faculty and students.

# 03 Mentoring

How can UROP develop and sustain a strong and supportive culture of mentoring throughout the program?

- **What is “mentoring” and why does it matter?**

Mentoring is a collaborative, developmental relationship in which an experienced researcher (a faculty member, postdoc, graduate student, research staff, etc.) supports an undergraduate’s intellectual, professional, and personal growth through guided research. Students learn research methods and how to frame and explore meaningful questions, and they develop critical thinking and ethical practices. Mentoring also develops students’ confidence and resilience, helps them navigate opportunities, and encourages their independence. For faculty and other researchers, mentorship enhances their research productivity and teaching.

- **Creating a community of scholars** also plays an important role in undergraduate research. Much of day-to-day mentorship comes from non-faculty (grad students, postdocs, staff scientists) and peer mentoring.

- **Developing mentoring relationships isn’t automatic or easy.** A majority (54%) of students surveyed report that they frequently or always worked remotely in a location other than the lab or office, and one in five reported that their interactions with faculty and other

supervisors were either non-existent or infrequent (less than once a month). Nearly half (47%) said that their faculty mentor did not know them well enough to write an informed letter of recommendation for them.

- **Still, most MIT students have a positive experience.**

Two-thirds report building a relationship with a faculty member or other researcher as an outcome of their UROP experience. More than 80% of students said that their interactions with faculty and other mentors were good or excellent, and 94% of participating students said that their UROP mentors treat them fairly and with respect.

- **UROP provides guidance and a range of resources** to support healthy mentoring practices. However, the program’s current efforts are not scaled to meet current demand or need.

- **What else is happening at MIT?** At MIT, CAPD has developed and launched a [graduate certificate](#) in research mentoring; other initiatives to improve mentor training and resources are underway in the Vice Provost’s office, the Undergraduate Advising Center, (UAC) the Office of Graduate Education, (OGE) and elsewhere at MIT. And in February 2025, UROP contributed a [white paper](#) focused on mentoring to MIT’s Task Force on the Undergraduate Academic Program.

- **We can learn a lot from our peers.** Some of our peer schools invest in both mentor training and skills development, and in supporting students so they can demystify and navigate these relationships more effectively. For example: offering a curriculum that results in a certification for new mentors, expanding and adapting mentor training for graduate students, postdocs, and staff scientists, and offering drop-in hours for mentors to get help from undergraduate research office staff.





## GOALS

- Create a strong and healthy culture of mentoring throughout the UROP program

## RECOMMENDATIONS

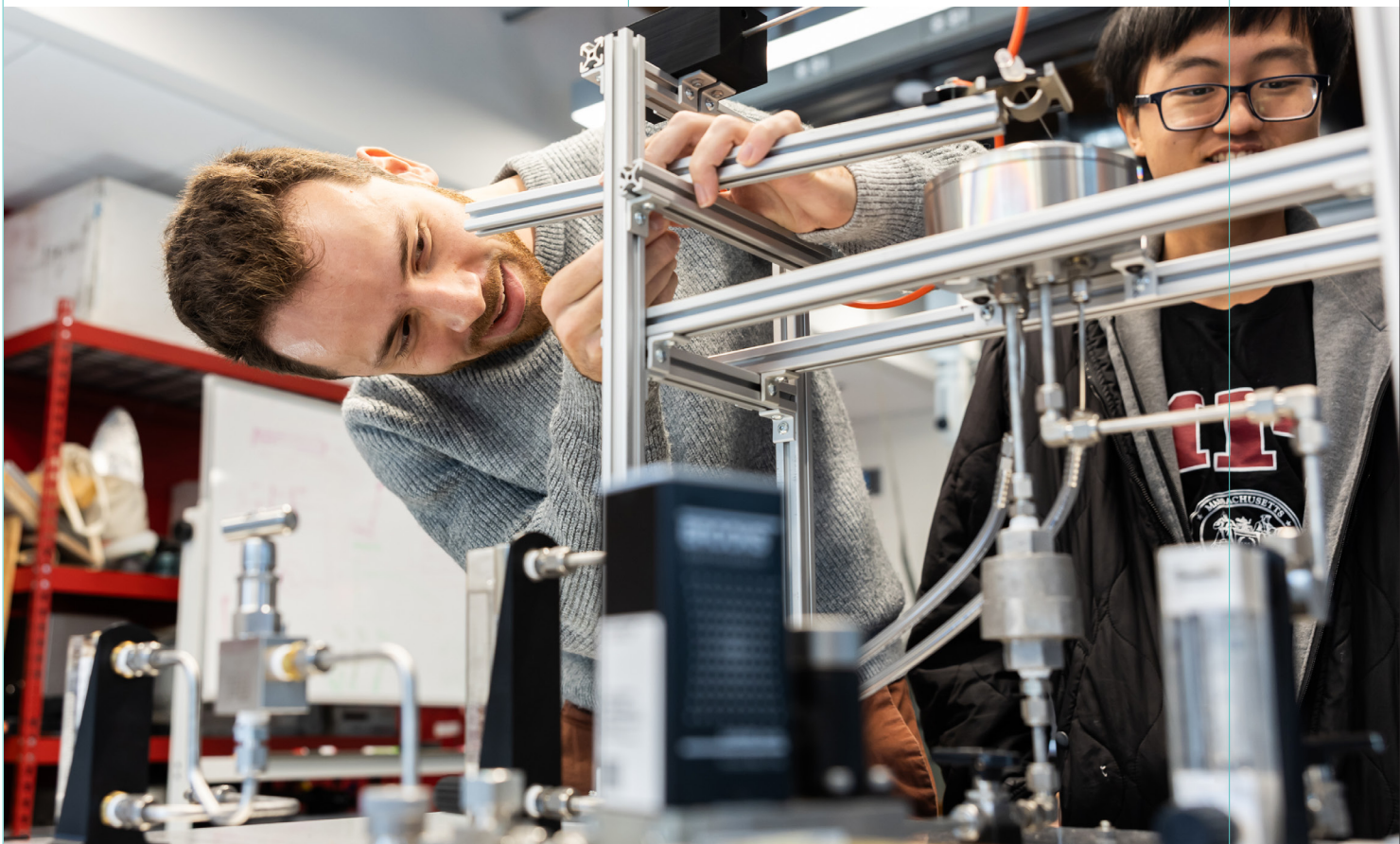
- Strengthen campus partnerships and actively engage in campus-wide mentoring planning with CAPD, UAC, OGE, TLL, Vice Provost for Faculty, academic departments, graduate programs, and other units with mentoring programs.
- Promote existing UROP mentoring programs and learning opportunities; explore participation incentives with departments, Pls, and others; expand offerings when demand exceeds supply.
- Celebrate and recognize excellence in UROP mentoring (new appreciation program, award).



# 04 Best Practices

What are the hallmarks of a successful UROP experience?  
How do we understand, promote, and support best practices  
in undergraduate research?

- The Council on Undergraduate Research has produced a **standard-setting analysis of undergraduate research**: [“Characteristics of Excellence in Undergraduate Research 2.0: The 11 Characteristics.”](#) While MIT is already meeting or exceeding many of the standards articulated in this report—in its institutional commitment to UROP, broad disciplinary participation, credit/pay options, compensation levels for students, etc.—the report identifies a number of areas in which there is room for improvement, such as summer research symposia and outcome assessments.
- **UROP is a centralized operation within a highly decentralized research environment.** While this offers certain benefits—broader visibility, tailored advising, unified application processes and deadlines, and dedicated capacity for financial and academic administration, budgeting, fundraising, etc.—it can also limit coordination with and visibility into varied lab and research environments.
- **We can learn a lot from our peers.** For example: formal student onboarding and reflection programming; mandatory research seminars and orientation sessions for students; public, campus-wide celebrations of student research outcomes, symposia, poster sessions, demo days, and other public events.



## GOALS

- Identify, compile, and promote best practices in undergraduate research experiences.

## RECOMMENDATIONS

- Compile and disseminate a diverse and actionable list of nationally-recognized best practices, drawing on a selection of the [“11 Characteristics of Excellence”](#) report and supplementing with MIT-specific examples. Focus areas could include:
  - Preparation: orientation, onboarding, and training
  - Duration: single vs. multi-term engagement
  - Reflection: assignments and prompts to process and contextualize learning
  - Communication: clear expectations, regular meetings, feedback, presentations
  - Integration: with curriculum, career exploration, etc.
- Explore new incentives and supports for best practice adoption: promote and incentivize high-impact “add-ons” that turbocharge student learning (e.g., reflection assignments, career workshops, public presentations, and other deliverables).
- Experiment with new ways to gather, share, and celebrate MIT-based best practices with key UROP stakeholders.

# 05 Access

What does the data tell us about equitable access to UROP? What barriers might exist for students, and how can we lower or eliminate them?

- UROP's robust 93% participation rate among undergraduates indicates that, overall, **there are relatively few barriers to entry or obstacles to participation** in the program. However, over the past 10 years, participation by male, first-generation, underrepresented minority, and low-income students has modestly but consistently lagged behind the average participation rate. Female and international students participate at higher-than-average rates.
- Students who have not participated in UROP cite **challenges finding a UROP and time constraints** as the primary barriers (56% and 47% respectively). While ELx lists many UROP projects at MIT, it isn't comprehensive. ([See Process, p. 16](#))
- **Trends from AY15-AY25:** First- and second-year students participate at higher levels than juniors and seniors, and students in the Schools of Science, Engineering, and Architecture and Planning participate at higher rates than those in SHASS and Management.
- MIT **guarantees one paid UROP semester to all scholarship recipients** during their undergraduate careers.

## GOALS

- **Ensure equitable access to UROP for all MIT undergraduates.**







## RECOMMENDATIONS

- Continue to track and analyze participation annually to understand trends; regularly share findings with campus partners.
- Continue to target outreach to underrepresented minority and first generation and/or low-income students through the UAC, student organizations and communities on campus.
- Partner with UAC and academic departments to support effective UROP advising for all students.
- Promote and incentivize wider adoption and utilization of ELx among faculty and students.

# Acknowledgments

The UROP Office is grateful to all of the students, faculty, postdocs, and staff who made valuable contributions to this plan. The UROP Strategic Planning Advisory Group has been an especially indispensable partner, and UROP is deeply appreciative of their time, attention, and ideas.

## Strategic Planning Advisory Group

- Scott Alessandro (Staff, Sloan School of Management)
- Manolo Barroso (Undergraduate, Architecture)
- Dominique Becker (Staff, UROP)
- Flavia Benevides (Staff, UROP)
- Michael Bergren (Staff, UROP)
- Haylea Brock (Undergraduate, Civil and Environmental Engineering)
- Bryan Bryson (Faculty, Biological Engineering)
- Ariel Furst (Faculty, Chemical Engineering)
- Katie Galloway (Faculty, Chemical Engineering)
- Collin Goldbach (Graduate Student, Mechanical Engineering)
- Manolis Kellis (Faculty, Electrical Engineering & Computer Science)
- Melissa Martin-Greene (Staff, UROP)
- Marie Stuppard (Staff, Aeronautics and Astronautics)
- Kate Trimble (Staff, Office of Experiential Learning)
- Kate Weishaar (Staff, Office of Experiential Learning)
- Parisa Yousefpou (Postdoc, Koch Institute for Integrative Cancer Research)



## Peer Interviews

- Michelle Ferrez, Director, Undergraduate Research Opportunity Program, the University of Michigan
- Jonna Iacono, Director, Office of Undergraduate Research and Fellowships, Harvard University
- Sophie Pierszalowski, Director, Office of Undergraduate Research, University of Washington
- Candace Rypisi, Assistant Vice Provost and Director of Student-Faculty Programs, California Institute of Technology
- Brian Thomas, Senior Director of Undergraduate Research, Stanford University

## MIT Interviews and Meetings

- Hamsa Balakrishnan, School of Engineering
- Anantha Chandrakhasan, School of Engineering
- Dan Huttenlocher, Schwarzman College of Computing
- Deborah Liverman, Career Advising and Professional Development
- Asu Ozdaglar, Schwarzman College of Computing
- Ana Pantelic, D-Lab
- Georgia Perakis, MIT-Sloan School of Management
- Agustín Rayo, School of Humanities, Arts, and Social Sciences
- Reza Rahaman, School of Engineering
- Janet Rankin, Teaching and Learning Laboratory
- Maria Yang, School of Engineering
- Leadership Councils of the School of Science and the School of Engineering
- Undergraduate Association
- Graduate Student Council
- Postdoctoral Association



urop.mit.edu  
P: 617.253.7306  
E: urop@mit.edu

77 Massachusetts Avenue  
Room 5-118  
Cambridge, MA 02139