Invention2Impact: An Opportunity to Lead

Summary: Dartmouth has a rich legacy of innovation, marked by cutting-edge research and global impact. It also has developed nationally recognized entrepreneurial training strategies. Given Dartmouth's scale and collegiality, its research excellence, commitment to innovation, and alumni community, the invention-to-impact (i2i) committee sees a remarkable opportunity to strengthen the flywheel of innovation through strategic deployment of resources. We can catalyze curiosity-driven exploration and foster breakthroughs that improve lives and inspire future generations if we ensure that every invention has a *clear and comprehensive pathway* to societal impact, every researcher finds the *mentorship and resources* needed to advance a promising discovery, and every student and faculty member has access to *exceptional training* in entrepreneurship. To achieve these goals, the committee recommends that Dartmouth *unify, empower, and fully fund an "i2i" function to proactively and strategically advance i2i efforts across campus and the broader university ecosystem with the overarching mission of maximizing the societal benefit of Dartmouth's STEM research.*

Charge and Approach:

Dartmouth aspires to maximize the benefit to society of its breakthrough research discoveries in science and technology. With this goal in mind, President Beilock requested a review of the current resources and practices supporting translational and commercialization -- or "invention to impact" (i2i) -- at Dartmouth. Our committee, comprised of faculty and alumni trustees and chaired by the Vice Provost for Research, was charged with conducting a comprehensive survey of existing infrastructure, reviewing best practices at peer institutions, and gathering feedback from internal stakeholders, to identify opportunities to expand and accelerate the impact of our research.

The committee and a team of consultants conducted over 60 interviews with senior leadership, faculty, alumni, and graduate students, and Office of Entrepreneurship and Technology Transfer staff. A faculty survey across Geisel, Thayer, and Arts & Sciences STEM departments garnered over 300 responses, achieving a >50% response rate. Additionally, the committee compared Dartmouth against peers using data from the Association of University Technology Managers Licensing Survey and via interviews of current and former tech transfer leaders at eight institutions.

Key Findings:

The committee's findings highlighted both strengths and challenges within Dartmouth's innovation ecosystem, and noteworthy differences vis-à-vis peer institutions.

Among the strengths, Dartmouth boasts a culture of curiosity-driven research excellence, collaboration, creativity, and entrepreneurship and is supported by a highly engaged alumni base. It is seen, as one interviewee noted, as "punching above its weight," including signature contributions in cancer immunotherapy and COVID-19 vaccine development. The institution's patenting rates are high compared to peer institutions, and faculty express satisfaction with the patenting processes. Programs such as the PhD Innovation Program and our emerging accelerators are widely recognized.

Despite these strengths, the assessment revealed multiple opportunities to enhance our programs. Variable and insecure funding models have hindered the strategic deployment of resources. Some programs exist in silos, excellent on their own, but relatively disconnected from each other. Faculty, especially outside of Engineering, are often unsure about their work's commercial potential or how to pursue opportunities for industry collaboration. We have yet to harness the full power of our alumni network. *Connecting these dots offers a transformative opportunity for Dartmouth*.

Benchmarking against peer institutions also provided valuable insights. Universities recognized for their leadership in commercialization are increasingly adopting highly *strategic, integrated, and proactive outreach and internal and external relationship-building* as part of their technology transfer activities; describe aggressive IP portfolio and cost management; and offer comprehensive support for startups. These institutions prioritize patents with high commercialization potential, foster industry partnerships, and maintain sustainable funding models, while helping faculty to identify promising opportunities for translational research.

Vision and Recommendations:

Dartmouth today boasts a thriving i2i ecosystem that belies its scale. Nevertheless, the committee sees the potential for even greater impact: a future Dartmouth where comprehensive, best-in-class resources are readily accessible and tightly coordinated to maximize translational success; where Dartmouth's policies promote faculty entrepreneurial engagement while maximizing the societal impact of discoveries; where i2i staff are deeply familiar with the breadth of Dartmouth STEM research and foster deep relationships with local ecosystems, funders, and alumni. In this future state, commercialization and entrepreneurship achievements would be widely celebrated at Dartmouth, and Dartmouth would attract greater numbers of entrepreneurial-minded faculty and students. This newly envisioned i2i function would be appropriately staffed and fully funded to effectively execute its mandate, led by an empowered leader accountable for the success of the invention-to-impact pipeline with a high degree of visibility and authority within the institution's organizational structure. Financial returns from any successes would be reinvested to support future scholarship and innovation.

This i2i function would take a proactive, strategic approach to:

- Establish an integrated and seamless pipeline from STEM discovery to impact
- Strengthen key programs and address gaps to boost translation/commercialization success
- Build Dartmouth's innovation culture and reputation to support i2i engagement/success

Proposed metrics for measuring the success of these efforts include assessing: (1) the societal impact of faculty STEM research, via both qualitative and quantitative measures, (2) progress towards commercialization, focusing on markers of quality and not quantity, and (3) translation and entrepreneurship activity, as measured by faculty engagement and satisfaction.

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Our goal is not to imitate other programs. Dartmouth's combination of research excellence, focused scale, and collaborative culture creates a unique academic environment. We can pair those factors with a savvy and engaged alumni base, a track record of entrepreneurial success, impressive resources, and leadership committed to the principle of maximizing the societal benefit of our work. If we succeed, Dartmouth will create a distinctive culture that bridges the perceived tensions between discovery and application and between scientific integrity and commercial success. Our researchers can be deeply engaged in understanding the world at its most fundamental level, while also creating solutions that improve lives. Commercialization can act as a force multiplier for research impact, and its returns can be thoughtfully reinvested to support the next generation of discoveries. Ultimately, an empowered and unified i2i team will catalyze the work of researchers who choose to focus on either end of this spectrum—as well as those who thrive across it—in their pursuit of excellence, creativity, and positive societal impact.

Appendix: Invention2Impact Committee:

- Dean Madden, Vice Provost for Research (chair)
- Will Griffith ‘93, Trustee
- Gevorg Grigoryan, Computer Science/Generate Biomedicines
- Katherine Mirica, Chemistry
- Laura Ray, Engineering
- Charles Sentman, Microbiology & Immunology
- Todd Sisitsky ‘93, Trustee
- Christopher Snyder, Economics