

Intrapreneurship: Strategic Approaches for Managing Disruptive Innovation in Clinical and Research Projects

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Idea

Exit

Topic Relevance by Timeline

Summary

- Academic research and intrapreneurship share many similarities with entrepreneurship but take place within a larger organization.
- Academic innovation depends on creative problem-solving, risk-taking, and resiliency.
- Personal and financial resiliency are important attributes of a successful academic entrepreneur and can be cultivated through strategic planning.
- An organization's culture of support for innovation, tolerance for failure, and financial resiliency all contribute to promoting the success of academic entrepreneurs.

Introduction

Most people are familiar with the term “entrepreneur” but are less familiar with the term “intrapreneur.” Indeed, many academic entrepreneurs first began as academic intrapreneurs. Academic physician-scientists are essentially intrapreneurs, meaning that they work within a larger organization to bring innovative ideas and solutions to existing problems or areas that can be improved. In the business world, the goal of intrapreneurship is to enhance the organization's value, whereas in the healthcare world the ultimate goal of intrapreneurship is to improve healthcare value, directly or indirectly through improving some aspect of the organization or the care that is delivered.

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While entrepreneurs tend to start new independent organizations, intrapreneurs are typically leaders of subgroups (e.g., research groups) within an established organization. Although the size of entrepreneurial-led and intrapreneurial-led groups may be similar, the external support and constraints around each group differ significantly. This chapter will describe intrapreneurial strategies, methods for embracing intrapreneurship as part of a research program, and tips for incorporating intrapreneurship into an academic career.

In general, the same principles that govern the success of entrepreneurs also apply to intrapreneurs. However, it is important to note that because intrapreneurs are not the drivers and decision-makers for the organization, they inherently have less flexibility and more limitations than do entrepreneurs who lead their own organizations.

How Intrapreneurship Aligns with Academic Research

Academic researchers identify clinical or basic science problems or questions that need to be addressed, and then they formulate plans to achieve those goals (see the chapter “Identifying Unmet Needs: Problems that Need Solutions”). Creative ideas and novel results lead to new directions and innovations. Ultimately, answering the problem or question may lead to a change in patient care or in the direction of a research field, which could directly affect the organization’s operations.

Leaders of research groups perform many of the same roles as small business owners or entrepreneurs (Table 1). However, as previously mentioned, because intrapreneurs work within an organization, the scope of their responsibilities generally differs from that of entrepreneurs. Intrapreneurs may be able to focus on a specific research area without many of the other business considerations that face entrepreneurs (overhead, taxes, market forces, etc.), although they may have other duties within their organization, such as teaching, that do not directly contribute to their research program.

Both intrapreneurs and entrepreneurs need mentors and a network of support that share or understand their motivations or goals (Rockquemore, “Build Your Dream Team”). It is more common for intrapreneurs to develop collaborations within their organization rather than externally, although this depends on the resources available within the organization. Similarly, there is typically less risk associated with academic research compared to starting a new business, primarily due to differences in funding sources (Rockquemore, “Shifting Your Mindset”; Wiens and Bell-Masterson). These differences in funding sources mean timeframes of individual research projects are typically shorter than a small business’s timeline; however, successful researchers must always be thinking on a larger scale regarding how to solidify and sustain their research program for many years to come.

Through the course of their career, an academic researcher will undoubtedly develop intellectual property, which must be disclosed to and shared with their organization. Because of the shared nature of such intellectual property, academic researchers and intrapreneurs typically receive a much smaller percentage of intellectual property revenue and have less control over licensing terms and partners than entrepreneurs (see the chapter “Intellectual Property: Ownership and Protection in a University Setting”). Sometimes the commercialization of this intellectual property can lead to conflicts of interest due to the fact that academic researchers and intrapreneurs are working within an organization with its own mission and set of values. In contrast, entrepreneurs without an academic affiliation have fewer conflicts of interest because they determine the company’s agenda (see the chapter “Understanding Conflict of Interest for Academic Entrepreneurs”).

How to Cultivate Intrapreneurship While Minimizing the Disruption of a Research Program

As previously mentioned, many academic researchers are natural intrapreneurs because they have set out to solve a problem or answer a question that will lead to some type of improvement—driving the science or clinical field forward, discovering new diagnostics or treatments for disease, and improving patient satisfaction, to name a few examples. At first glance, it may seem that claiming intrapreneurship as part of an academic researcher’s job description could lead to distractions or disruptions in their research program. The goal of this chapter is to provide reassurance and guidance regarding how to incorporate the mindset and skills of an intrapreneur to enhance, rather than deter, their research.

A commonality between translational or applied research and business entrepreneurship is the necessity of identifying the real problem(s) that need to be addressed in order to lead to the desired improvement. Oftentimes, what seems like the question or the problem on the surface is really just a manifestation of an underlying problem. If the true underlying issue is not adequately addressed, then the investigative strategy and resulting discovery may not lead to the expected outcome.

While several approaches can be taken in this process, a simple yet effective one is the “Five Whys” approach, originally developed as part of the highly successful Toyota production system (Ohno). To identify the root of a problem, one systematically asks “why” five times, digging more deeply with each question. Once the root problem or question has been identified, then the research approach should be targeted to address it. Although this method does not necessarily apply to all hypothesis-driven research, particularly basic research, it is helpful for focusing attention and resources on the most promising translational or applied research question(s). This is not to say that unexpected results can be avoided or that there will not be failures—such outcomes are important learnings that can indicate that the research project should head in a new direction, or that the true question or problem for the solution being sought has not yet been identified. The resulting new

research path may lead to the innovative idea that opens up new opportunities for the research program.

Table 1. Comparison of Academic Research vs. Intrapreneurship vs. Entrepreneurship.*

	Academic Researcher	Intrapreneur	Entrepreneur
Funding	Typically <\$2 million	Variable	Typically >\$1 million
Timeline	1-5 years	1-5 years	3-10 years
Inherent Risk	Lower	Lower	Higher
Partners	Usually Internal	Usually Internal	External
Intellectual Property Ownership	Less	Less	More
Conflicts of Interest	More	Some	Less
Financial Support	Internal Grants, External Grants, Industry Partnerships	Internal Grants/Support, Less Commonly External Grants and Industry Partnerships	External Investors
Methodology	Scientific Method	Plan-Do-Study-Act	Lean Launchpad, 6 Sigma
Regulatory Limitations	IRB, FDA, Sponsor (NIH, etc.), Academic Organization	IRB, FDA, Organization	IRB, FDA

*An academic entrepreneur may blend aspects of all three of these categories. Note: This table compares (academic) intrapreneurs with (non-academic) entrepreneurs for illustrative purposes only. Exact timeline and funding amounts would depend on the nature of the research, product or service.

As with any research program, it is important to remain focused on the specific scientific or clinical field that drives a research program. As discussed above, this does not mean that new questions or new avenues of research will not open up in the process of conducting research, and the research questions may change over time. To successfully incorporate intrapreneurship into an academic career, it is advisable that the topics and goals are similarly oriented to those of the primary research program. It is also valuable to identify which innovations and lines of research are associated with intellectual property that can be commercialized (see the chapter “Intellectual Property: Commercializing in a University Setting”). Embarking on new research projects in unrelated fields consumes significant time and energy to gain the knowledge sufficient to be successful and can distract from the primary research path. In these situations, intrapreneurs can reach

out to colleagues with the expertise who may be able to carry out the new line of work in partnership.

As will be discussed below, it is particularly difficult for academic researchers to manage these types of competing interests in how their time is spent. They answer to a supervisor within their organization, such as a division chief, chair, or center director, who requires them to fulfill job duties that are not directly related to their research or intrapreneurial activities (e.g., committee time, mentoring), some of which may be required for promotion or salary justification. This makes finding sufficient time for both a specific research program and the associated intrapreneurial activities significantly more difficult for intrapreneurs compared to entrepreneurs. By garnering support for a research program and intrapreneurial endeavors from a supervisor or higher authority within the organization, intrapreneurs can achieve some degree of protection from some of these distractions, if the discussions and expectations are laid out clearly. The key is to maximize this protection, as will be discussed below.

What Intrapreneurs Need to Bring to the Table

Intrapreneurs tend to have strong leadership skills and professional motivation, in addition to an entrepreneurial spirit (Chan et al.; Rockquemore, “Shifting Your Mindset”; Williams). In addition to these intrinsic traits, intrapreneurs must be strategic in their pursuits (Garcia-Martinez; Williams; Biswas and Kirchherr; Paxson). To accrue support for a research program, it is essential to identify key stakeholders within the organization. Learning the objectives of these key stakeholders can help shape how a research program is molded to contribute to these objectives. Aligning the goals of the research program with the stakeholders’ goals will more successfully lead to obtaining their buy-in for the program and related ideas. The importance of building a mutually beneficial relationship with these key stakeholders within the organization cannot be overstated. Ideally, intrapreneurs should aim to grow within their organization, rather than apart from it.

One way to gather institutional support for a research program is to engage with established staff members who can contribute their expertise to forward the research program and also advocate for it. For example, if an academic researcher is interested in adding a nutrition assessment component to their research, working with an established nutrition center at their university can provide valuable support and buy-in. Developing viable business models is an important part of the intrapreneurial process (see the chapter “Writing the Business Plan for a Life Science Startup”). Other potential partners are an innovation center, a technology transfer office, or a commercialization program within the organization, which will be able to efficiently facilitate some transactions or collaborations that can propel a research program either along the same path or in a new direction (see the chapters “Working with the University Tech Transfer Office” and “Resources at Academic Entrepreneurship Centers”). If these types of centers do not currently

exist within an organization, then proposing to establish such a program could be a great incentive to the institution. The initial investments made by the organization in establishing or growing such centers can lead to large payoffs in the future.

Differing opinions exist regarding how much risk should be taken in research. In general, it is advised that junior investigators avoid high-risk research projects; more established investigators have more tolerance for failure so are better equipped to take more risks. However, innovation requires some degree of risk-taking. It is important to be creative in identifying a problem, determining a method to test or change this problem, and then be able to leap from that outcome to the next step. This process requires a willingness to go where the problems are, being open to changing hypotheses, and perhaps even changing the specific research area of focus. Knowing when to abandon a particular project or approach is a skill that is difficult to develop, so reaching out for the opinions of trusted people can be very helpful in this area. In general, a mindset of continual improvement is important for intrapreneurs. Improvement requires occasional failure, so accepting this and being resilient in picking oneself back up and pushing ahead in a new direction is key for success (more on this later).

What Organizations Need to Bring to the Table

It behooves academic institutions to establish a culture that supports intrapreneurs (D'souza; Govindarajan and Desai; Schiefelbein). As intrapreneurs seek improvements and breakthroughs through their research programs within the institution, the institution shares in and benefits from their successes. Therefore, it is necessary that the institution also share in, or at least accept, the failures and delays that are inherent to research. Organizations that effuse a culture of openness and appreciation for innovation while remaining focused on outcomes provide a supportive environment for intrapreneurs to thrive in. The cultural aspects of an organization typically flow from the leadership down. It is important to recognize that institutional leadership and supervisors can change rapidly, so an organization with a deeply entrenched culture of supporting innovation, with multiple prior examples of innovative success, is ideal. Moreover, celebrating and publicizing those successes reinforces the innovation culture and helps insure its longevity.

In addition to providing cultural support for intrapreneurs, organizations must provide financial and infrastructural support for academic researchers. Such support may include internal pilot grants or bridge funding for individual research programs, financial support to establish or grow larger research and/or innovation centers, and offices to help navigate the legal issues associated with innovation and development. Establishing such infrastructure allows the organization to support multiple intrapreneurial endeavors, which can provide synergy and lead to novel collaborations. However, the institution must strike an appropriate balance between promoting synergistic innovation and giving intrapreneurs sufficient space to perform independently. It cannot be stated strongly enough that innovative organizations do not want to lose intrapreneurs,

especially due to bureaucratic obstacles, since intrapreneurs bring increased value to the organization.

Importance of Resiliency

Resiliency is the tolerance of and ability to recover from failure. Resiliency is a necessary attribute both for intrapreneurs and for the organizations within which they work. Most academic researchers are probably familiar (maybe too familiar) with failure—declined grant applications, rejected manuscripts, negative experimental results. Resiliency is a key aspect of performing research and particularly leading a research program. This takes the forms of personal resiliency (emotional strength, positive outlook, and perseverance) as well as group resiliency (leadership and networking). Groups with leaders who establish a flat hierarchy within their research group, which promotes a sense of shared responsibility and “we are all in it together” mentality, tend to fare better when met with obstacles. Similarly, the ability to network and establish collaborations and partnerships, both internal and external to the organization, opens new avenues for research development.

For both the intrapreneur and the organization, financial diversification is essential to enhance financial resilience. For many years now, it has become clear that successful academic researchers should seek a diversified funding portfolio including federal grants (including Small Business Innovation Research grants), foundation grants, internal grants, corporate partnerships, and philanthropy. From the perspective of the organization, relying on traditional sources of support, such as endowments, philanthropy, and clinical or research revenue, is also no longer sufficient to provide long-term support for their clinical and research programs. Partnering with external companies and supporting the development of new companies from within provides new (and often larger) sources of revenue. Furthermore, institutions must be aware of changes in regulations, clinical practice, and insurance reimbursement well ahead of time in order to plan accordingly and make adequate changes to their clinical and/or research programs, so that a sudden loss of a particular source of revenue does not overwhelm the organization. While exploring these new opportunities, however, it is important to keep in mind potential conflicts of interest, and intellectual property ramifications. In regards to conflict of interest, early discussion with the university research compliance office is often helpful, while intellectual property can be effectively managed by filing an invention disclosure with the technology transfer office so they can begin the process of providing guidance regarding negotiations, even at the earliest stages (see the chapter “Working with the University Technology Transfer Office”).

Examples of Intrapreneurship Success Stories

Successful intrapreneurship stories can provide helpful tips (Figure 1). One of the early academic entrepreneurs is Dr. Raymond Rodriguez, professor of molecular and cellular biology at the

University of California–Davis. Early in his career he was a pioneer in the recombinant DNA field, which resulted over the years in 20 patents, his personal founding of three biotechnology companies, and his assistance with founding an additional 25 technology startup companies. Meanwhile, he remains an active faculty member, teacher, mentor, and laboratory leader at UC–Davis. His advice is to “look at discoveries and new technologies from both a basic and applied perspective” (Villareal et al.).

One of the more recent examples of an academic entrepreneur is Dr. Carl June, professor of immunotherapy at the University of Pennsylvania. He developed a groundbreaking cancer therapy utilizing patients’ own T lymphocytes and genetically engineering a chimeric antigen receptor. The technology, called CAR T-cell therapy, was licensed to Novartis and recently received FDA approval for more widespread use. However, this journey was over 20 years in the making and came upon a fair number of obstacles, including periods of paucity of federal funding. Many factors, including perseverance, risk-taking, philanthropy, and corporate partnership, led to the successful development of a life-saving innovative therapy. He credits the university’s “gutsy” early investment in translational research for providing a supportive environment for his work (Kim).

Conclusion

This chapter presents strategies for aligning intrapreneurship with academic research, a useful goal for any academic entrepreneur. As contributing members of a larger organization, academic entrepreneurs face certain challenges and limitations that are distinct from those faced by a traditional entrepreneur. However, the academic infrastructure and funding mechanisms can, in many ways, be used to the academic entrepreneur’s benefit, such as through intrapreneurship. As with any relationship, establishing mutual benefits for the intrapreneur and for the organization is key to fostering successful innovations.

Figure 1. Tips for Intrapreneurial Success.

- Embrace creativity and calculated risks
- Set realistic timelines
- Establish deliverables and measures of success from the outset
- Secure support from the chair/immediate superior (funding, assistance, protected time)
- Diversify funding sources
- Identify innovations associated with intellectual property that can be commercialized
- Establish a new innovation center or clinical program within the department, or partner with an existing center or program at the organization

Resources

1. Penn Wharton Entrepreneurship: Intrapreneurship
 - a. Recommended courses related to intrapreneurship at the University of Pennsylvania.
 - b. <https://entrepreneurship.wharton.upenn.edu/teaching-research/graduate-entrepreneurial-paths/intrapreneurship/>.
2. Healthcare Innovation and Entrepreneurship
 - a. This online interdisciplinary course focuses on sustainable innovation, introducing entrepreneurial students to the realities of problem identification and solution design within the complex world of healthcare.
 - b. <https://www.coursera.org/learn/healthcare-innovation>.
3. Innovation: From Creativity to Entrepreneurship
 - a. This online certificate-granting specialization includes seven courses that address how to recognize and question assumptions and constraints so as to identify and capitalize on opportunities.
 - b. <https://www.coursera.org/specializations/innovation-creativity-entrepreneurship>.
4. Entrepreneurship: Launching an Innovative Business Specialization
 - a. This online certificate-granting specialization includes three courses plus a capstone project that focus on developing entrepreneurial skill sets, bringing innovations to market, and crafting a successful business model.
 - b. <https://www.coursera.org/specializations/business-entrepreneurship>.
5. Lean LaunchPad
 - a. The free online course “How to Build a Startup” by the creator of Lean LaunchPad, Steve Banks, introduces the business skills it takes to bring an idea from conception to market.
 - b. <https://www.udacity.com/course/how-to-build-a-startup--ep245>.
6. Dealing with a Paradigm Shift
 - c. Pack, A. I. “Dealing with a Paradigm Shift.” *Journal of Clinical Sleep Medicine*, vol. 11, no. 8, 2015, pp. 925–29, doi: [10.5664/jcsm.4948](https://doi.org/10.5664/jcsm.4948).
 - d. This article describes how one clinical program dealt with a fundamental change in their reimbursement model.
7. Intrapreneuring: Why you don't have to leave the corporation to become an entrepreneur
 - e. Pinchot, G. *Intrapreneuring: Why You Don't Have to Leave the Corporation to Become an Entrepreneur*. Harper & Row, 1985.
 - f. A helpful summary of intrapreneurship, highlighting several key points.

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