

Introduction: What Is Academic Entrepreneurship?

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“Twenty years from now you will be more disappointed by the things you didn’t do than by the ones you did. So throw off the bowlines, sail away from the safe harbor, catch the trade winds in your sails. Explore. Dream. Discover.” ~ Mark Twain

The editors of this book were inspired by the recent momentum and urgency around translating science and technology into health innovation (Fernandez-Moure). Near constant disruption to clinical care and delivery is enabled by technological advances and breakthrough discoveries. The number of health and medical accelerators and incubators is growing, as are efforts to develop institutional resources and educational programs for faculty, which connect like-minded researchers to one another and to resources by establishing innovation ecosystems.

To support this rapidly-evolving world, a new breed of academic has emerged: the academic entrepreneur. An increasing number of academic colleagues seek to patent and/or license their work, spin-out or spin-in ventures based on evidence, and/or collaborate with industry to realize impact. Yet, there is no repository for the evolving knowledge base and experience around translating evidence into impact, and the editors observed a need for an open exchange.

This is the purpose of this living, e-book: to create a virtual home for sharing tools, wisdom, and best practices that will enable the next generation of academics to transform medicine.

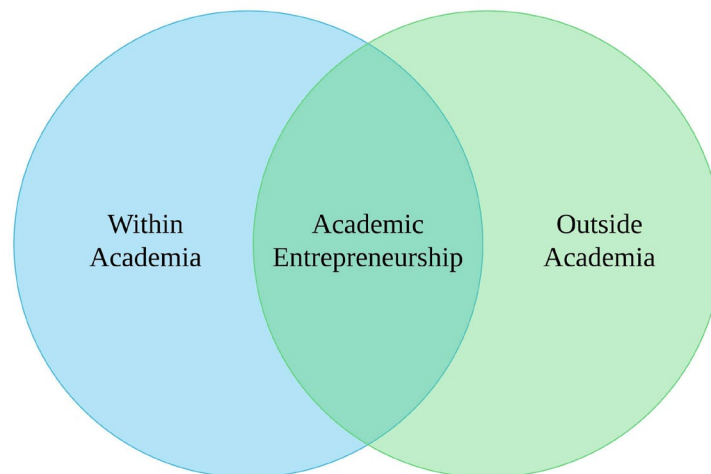
Previously, medical and health scientists interested in commercialization could choose between two paths: (1) within Academia, pursuing an academic research career, either through foundational discovery or sponsored research, or (2) outside Academia, pursuing a career realizing impact from discoveries, whether through startups, venture capital, or funding from hospitals, government and other non-academic entities. While these two paths and variants of them persist, a new translational research career path has emerged with the goal of realizing the return on investment in medical

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and health science. This path of academic entrepreneurship allows those in academia to explore the commercialization potential of their own and other discoveries, and to think not just of expanding knowledge, but also of improving implementation, impact, and the bottom line (Garcia-Martinez). These academics do not want to rely on others to realize the potential of important discoveries that can improve health; rather, they choose to take on the work of shepherding discoveries to inventions and interventions that reach patients and populations. They blend the rigor of academia with a realistic view of market challenges and needs in order to translate innovation and evidence into cures and improved health. In the highly regulated worlds of academic medicine and healthcare, successful academic entrepreneurs must maintain: careful attention and adherence to ethical and regulatory principles, along with a deep knowledge of science and the needs of patients and families, in addition to the business acumen to recognize commercialization potential, de-risk, and create value from breakthrough ideas. This book is a guide for those who identify with this method and this goal—the self-described academic entrepreneurs, industry or small business partners, students, academic administrators, or medical executives that constitute the healthcare innovation ecosystem.

Figure 1. Positioning of Academic Entrepreneurship.

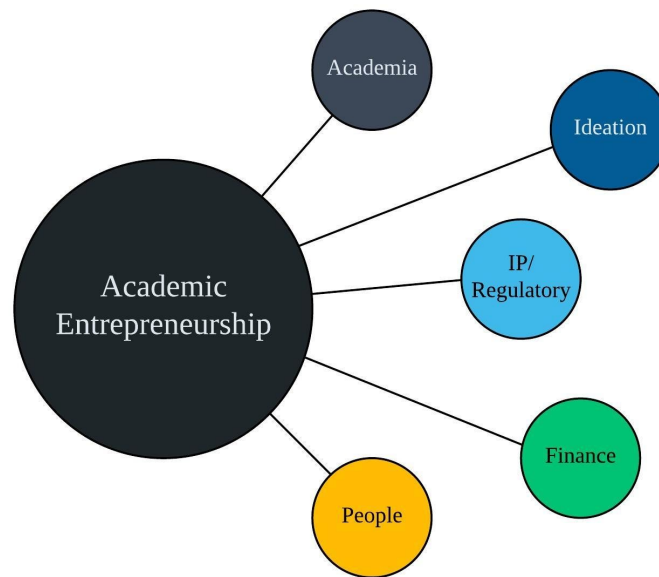


How is this book organized?

This book is designed to serve as an effective resource for those interested or involved in academic entrepreneurship, at any level, from students to seasoned academics or executives; it can provide answers to specific, nuanced questions or give an overview of the resources and processes of academic entrepreneurship for those who may not know where to begin. As an e-book and living document, *Academic Entrepreneurship* will provide in-depth knowledge on a wide range of pertinent topics with up-to-date information and resources categorized into five primary domains:

- 1) Academia: Though a growing community in academia recognizes and supports the potential of this new path, working in an academic environment can pose several unique challenges to the work of an academic entrepreneur. Primary among these challenges is the appointment and promotion process, which typically values traditional metrics (e.g., grant funding and publications) over translational work and research implementation, along with university culture, which often promotes a single-minded focus on research, not commercialization. This section of the book will offer recommendations for finding funding, mentorship, and other institutional and resource support to smooth career transitions and development.
- 2) Ideation: Academic settings are inherently creative places, yet ideation can be constrained by a tendency to isolate oneself from the actual customers that may use the technology or product. This section will explain how to apply a lean startup methodology to research, focus on needs-based development, and design with an eye toward implementation.
- 3) IP/Regulatory: Intellectual Property is often carefully monitored by academic entities, with varying degrees of flexibility around licensing. Major regulatory concerns exist with regard to medical and health sciences, particularly around Conflict of Interest and ethical conduct of research. This section will cover the disclosure, patent, and licensing processes, and how to navigate the network of industry regulation that shapes academic entrepreneurial work.
- 4) Finance: Engaging with for-profit partners while operating in a non-profit academic institution can create cultural and legal challenges. This section discusses business and strategic planning, grant and seed funding, and equity allocation for academic startups.
- 5) People: Any successful commercial project requires building a team with clearly-defined roles, expectations, and financial rewards. Yet, aligning this model with the traditional teacher-student model of academic institutions and creating open dialogue between team members can prove challenging. This section offers strategies for networking, negotiating, building a team that is diverse in both background and skill, as well as maintaining external partnerships.

Figure 2. Domains of the Book.



How can this book be used and how will it change?

Each chapter is designed to provide a quick summary (be read in five to ten minutes) to address common challenges that can arise throughout this process. Together, these chapters offer a deep-dive into each of these five domains, providing a compendium of academic entrepreneurial information, tools, advice, references, and resources. These chapters, by no means, represent the final word on academic entrepreneurship, but rather, they serve as a foundation on which to build the growing knowledge base in this field.

Figure 3. How to use the Timeline figure.



The figure above can be found at the beginning of every chapter. The continuum represents the time and stage of a project, beginning with the initial idea and ending with an exit or execution of the entrepreneurial process. The opacity of the color, which will match the chapter section, represents the relevancy to each stage of the process: the darker the color, the more relevant a certain chapter's content is to that stage in the process. Consider this figure as a guide to gauge how important a topic will be, given the stage of the idea. In regards to syntax, the word "they" and its derivatives are used as gender-neutral singular pronouns throughout the book.

Recognizing that the translational space is evolving rapidly, this first edition is intended as a “Minimum Viable Product,” and, like all good entrepreneurial endeavors, this product will evolve. However, the value and progress of *Academic Entrepreneurship for Medical and Health Scientists* will rely on the community that benefits from it. Please contribute wisdom, best practices, and experience to ensure that scientific and technological discoveries realize their full potential in improving health.

To this end, consider this an invitation to join this effort as a sponsor, a dissemination partner, or a contributor—by updating and writing new chapters, sharing new processes, metrics, and tools, uploading new resources (e.g. slides, worksheets, templates, links, articles, and more); this book will reach its full potential by crowdsourcing content and building community. The editors see their role as facilitating the exchange of ideas and curating the book to ensure high quality and incorporate these new insights.

By making this an e-book, the aim is to foster a community that will make this a living resource and guide for all academic entrepreneurs and those who want to support them in their quest to advance their discoveries, with seasoned academic entrepreneurs sharing their wisdom of experience with those newer to the process. In addition to hosting this forum, the ultimate goal is for this book (and the mindset and methodology it represents) to be broadly embraced in medical, life science, and nursing education in order to perpetuate this “Third Way”—combining clinical knowledge with rigorous science and research, and incorporating entrepreneurial and implementation skills to create positive, evidence-based change in health and medicine.

We hope this book proves useful in helping those who wish to advance research discoveries that make a difference in public health and the lives of patients.

References

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