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Draft - Forming and Maintaining Meaningful Partnerships: Academic Scientists and Corporations

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Summary

This is a test book chapter upload of the draft version of the chapter Forming and Maintaining Meaningful Partnerships: Academic Scientists and Corporations by Joy Sun and Flora Winston.

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Forming and Maintaining Meaningful Partnerships: Academic Scientists and Corporations

Authors

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Summary

- Create “neutral space” opportunities, such as consortia and meetings that allow fruitful interactions but protect the interests of all parties in order to ensure that academics can remain a credible source free from bias.
- Find and establish partnerships through corporate or government information “gatekeepers” and internal influencers.
- Work collaboratively to create a logic model to clarify shared goals while documenting the partnership’s objectives, success metrics, expectations, and timeline.
- Anticipate potential problems and challenges in the partnership prior to committing to work together and, if the partnership proceeds, develop strategies for how to resolve issues.
- Start small: confirm and establish a framework for engagement by implementing short-term projects and goals.

Introduction

For academics desiring to make a broad impact on health and wellness through new products and services, collaboration with corporations is often necessary. This chapter will provide basic guidelines and helpful tips on how academics can form meaningful and successful partnerships with non-academic organizations and corporations. For the purposes of this chapter, the term “academic” is used for anyone within academia interested in working or collaborating with non-academic organizations and will be used interchangeably with academic entrepreneur.

Academics can derive many benefits from industry-academic partnerships. In a typical partnership, the academic entrepreneur designs prototypes and conducts fundamental, formative,

and evaluative research. The commercialization partner provides complementary activities, including raising capital, “ruggedizing” prototypes, and delivering a product or service at scale. Ruggedizing prototypes is the process by which products are built to resist wear, stress, and other factors that could degrade reliable, consistent performance and is thus necessary to ensuring a commercial-grade, high-quality product. In addition, learning how products perform when delivered at scale can identify new areas for research for the academic and can provide strong validation for the scientific foundation underlying the product.

Academic organizations are often limited in their commercialization activities because these institutions 1) may not have sufficient resources and expertise in commercialization; 2) might not have the capability or capacity to deliver at scale and provide customer support; or 3) might be subject to taxation for “unrelated business income.” Unrelated business income is defined as a trade or business that is regularly carried on and is not substantially related to the purpose of the organization for which it received its exemption from taxation. This is relevant for most non-profit organizations, including academic organizations, as they are categorized as 501(c)(3) under Title 26 of the United States Code. Their exempt purpose must fall within “charitable, religious, educational, scientific, literary, testing for public safety, fostering national or international amateur sports competition, and preventing cruelty to children or animals,” excluding sales or commercialization of a product (irs.gov, 2017). A partnership with a commercial entity, when done correctly, can be mutually beneficial: the academic or non-profit entity can restrict activities to science, education, and medical care while the commercial entity can bring the resultant, excellent products to society at scale.

Mutually Beneficial Partnerships

The most important thing to keep in mind is that partnerships must be mutually beneficial. Ideally, all parties in a partnership will share a long-term goal and respect the complementary expertise that each brings to the table. Just as the academic partner should respect the corporate partner’s expertise in commercialization, the corporate partner should respect the unbiased, credible research methods, analysis, and interpretations that are expected of the academic partner. Two of the safest ways to ensure that these roles are protected are through 1) corporate-sponsored research that is managed through the academic institution, including language regarding the right to publish, and 2) research funded via a corporate-sponsored consortium (e.g., National Science Foundation Industry-University Cooperative Research Centers). Industry-academic consortiums seek ideas from the company partners and academic faculty, who can provide the research priorities as well. Projects for the consortiums are selected by a panel made up of industry representatives.

There are five key considerations that underscore a mutually beneficial academic-industry partnership: 1) create a mechanism for establishing a neutral space through which each party's interests are heard and served, credibility and lack of bias are maintained, and processes are in place to resolve conflicts; 2) identify and connect with corporate "gatekeepers," those who are respected, influential, and connected to others in their corporation, particularly the leadership; 3) formalize the collaboration utilizing a logic model in which there is an articulation of goals, expectations (e.g., promised resources), and target metrics for success; 4) identify potential challenges to the relationship and how they will be handled; and 5) memorialize agreements within a mutually beneficial framework for engagement to track decisions and intellectual property.

Creating a Neutral Space

While both corporate and academic partners may share the same long-term goal (e.g., saving lives, curing cancer), meeting business objectives may require marketing, endorsements, pivots, or methods that are not in alignment with the academic partner's objectives. Likewise, the objectives of the academic partner may not be in the interest of the industry partner. For example, while both may want the insights derived from the academic's research, only the academic has the additional obligation to publish the research results. It is often the case that corporations will settle for less certainty, complexity, or precision in results and insights than is acceptable in academia. In addition, university policies that govern the academic's conduct of research (e.g., regarding conflicts and human subjects protection) might be more conservative than those of the industry partner. Thus, two strategies for protecting the interests of all members of an industry-university partnership are 1) to employ a neutral third party (e.g., a data oversight board or an impartial reviewer), or 2) to fund the work through a consortium model with bylaws and accountability. The key concept behind both of these strategies is that priority is given to guaranteeing that the academic can maintain their reputation as a credible, independent scientist and a source free from bias.

The first step to creating a mutually beneficial partnership is to identify where conflicts might arise. For these conflicts, it will be important to remain impartial and highly factual in presentations, ensure impeccable data methods, and limit provision of opinions or over-interpretation of results. In this way, the academic remains true to the science, neutral about the results, and can continue to be seen as a trusted expert. The data then becomes a neutral foundation on which partners, including the academic, receiving the information can independently derive their interpretations. Such a data-driven, neutral "space" prevents any one member of a collaboration from gaining more power or influence than another. By creating this neutral space, you will be able to have multiple companies in one room despite the fact that they may be direct competitors in the marketplace.

A consortium model is an organized collaboration among multiple individuals, companies, or governments with the intention of working toward a chosen objective. The consortium will provide structured framework and guidelines to make sure that an academic-commercial partnership can move forward in the interests of both parties. A relevant example of a consortium is the Institute for Food Safety and Health (IFSH), a research consortium consisting of the Illinois Institute of Technology (IIT), the United States Food and Drug Administration's Center for Food Safety and Applied Nutrition (FDA CFSAN), and other members of the food industry.

The academic should take into account their stature in the field when considering the nature of the industry-university partnerships they enter. If the academic is senior they can afford to not only conduct research on a topic but also provide controversial opinions based on that research (e.g., when the National Academy of Medicine reviewed and recommended changes to reduce the frequency of mammography screening) while continuing to preserve relationships with partners. On the other hand, more junior faculty members should consider building a strong scientific foundation and gaining credibility in the field before espousing controversial positions, as this advocacy, while important, might limit their recognition as an unbiased scholar. The academic entrepreneur, regardless of stature in the field, must recognize the conflicts they have when conducting research, analyzing data, or drawing conclusions, as they may have a perceived financial interest in the findings. In this case, they may need to isolate themselves from contact with participants or their data and appoint a non-conflicted principal investigator to oversee the conduct of the research and the analyses. Bias is an issue that any academic can face regardless of their role because all academics must abide by university policy and promotion expectations. To read more about promotion expectations within a university, please see Chapter X.

Connecting with Gatekeepers

Through the strategies of conducting research in a consortium or by implementing safeguards to prevent undue coercion or bias, robust research careers can be built on corporate-sponsored research. However, the first step is to build the relationship, not to talk about bias. Typically, this will happen in settings in which academics present their work that potential representatives of the commercial entity, the gatekeepers, attend to bring insights back to the corporation and network on behalf of the corporation. Gatekeepers also maintain extensive networks within the corporation and relationships with corporation leadership in order to share the information that they gather. Therefore, these people are influential and open the doors for academics. For academics who want to be on the cutting edge of biotechnology and other technology, it is essential to attend and present not only at academic meetings but also at key trade conferences, government-sponsored meetings, and industry-sponsored topical summits because it is here that gatekeepers might reveal the direction in which the company is headed or showcase new

innovations and inventions. These events are ideal opportunities for academics to network with those who can commercialize their science and engineering research and also gain access to the latest technology to ensure that their research remains cutting edge. For each industry there are several conferences one can attend at any given time of the year. For example, within the field of biotechnology there are annual conferences such as the Business of Biotech Conference and the Global Congress on Biotechnology. Additional examples of conferences relating to biotechnology and medical devices can be found in the Resources section of this chapter.

In general, the ideal gatekeeper is someone who has easy access to both interested academics and members at the top of a corporation hierarchy. Gatekeepers may not have direct access to significant financial resources within a company, but if they are impressed by an idea they can introduce academic partners to people in the company who do have access. Compared to other members of a company, gatekeepers are approachable because it is their duty to actively seek out interested academics in order to form new partnerships. Moreover, gatekeepers can obtain many benefits by ensuring that they provide cutting edge academic research to the company to inform product development. In essence, gatekeepers are knowledge managers and matchmakers—bringing the right information and people together to advance discovery. Since academics and gatekeepers can mutually benefit from connecting with each other, gatekeepers are an ideal first step in starting a conversation about a commercialization idea, but it is important to recognize that while this person might be friendly, their job is to bring insights back to the corporation. The gatekeeper will be a good sounding board for an idea and will be able to maximize your chance for success. Unlike the anonymous federal grant review processes, if you develop a sincere, mutual respect with the gatekeeper you will likely be able call on them to review your project proposal and documents before you communicate with an executive who has access to the budget.

When managing the partnership, the academic might think about three R's and I: relevance, rigor, relationship, and importance. These factors, coined by Dr. Flaura Winston's team as RRRI, are the key to obtaining funding for research. To gain interest, you need to demonstrate relevance of the proposed work to the corporate sponsor and the academic's capability to conduct rigorous and thorough research. Keep in mind, this proposed work may be different from the relevance for the field. The relevance and rigor give the confidence that a strong relationship of mutual benefit and respect will ensue. The amount of funding that will be given to the project and the timeliness with which the request goes through the approval process is directly related to how important the proposal is perceived to be. Just as an academic will prepare for a federal proposal by reading a request for proposals, when preparing for a corporate-sponsored proposal it is important to read and understand the needs and goals of the sponsor. If the organization's and the academic's goals are dissimilar, then it's likely that many of the academic's goals are considered irrelevant to the

organization and vice versa. The academic should know how to spot these signs and discuss with the organization accordingly in order to avoid any conflicts in the future.

The Logic Model

Once an interested gatekeeper has agreed to begin a collaboration, the next step is to create a structured and organized plan to accomplish the intended goal. One method to creating a plan is through the use of a logic model. A logic model is a series of “if-then” steps that link the partnership activities to shared intermediate outcomes and, eventually, the ultimate end goal. This is a formal way to articulate the shared vision of the collaboration and can be used in both the planning and the implementation stages. The simplest type of logic model contains four components: inputs, activities, outputs, and outcomes. These “steps” are listed in chronological order; however, during the planning stages it is imperative to work backwards. Thus, the first step would be to determine the outcome; this makes planning the earlier steps much easier. All parties should identify and agree on the ultimate, long-term goal with measurable, time-limited impact success metrics. Next, they should work backwards to define intermediate goals, outline steps to achieve these goals, and define process metrics, which is how the partnership will ensure that the proposed work is on track. Partners should agree on short-term goals as well. In order to reach an outcome, a series of activities must produce measurable outputs—for example, completing data collection or building a prototype. The inputs are raw materials, the people and environment, the scientific foundation, and the capital required to perform an activity. The advantage of utilizing a logic model planning process is to articulate a “compass” or direction for the partnership to ensure a common understanding of what resources will be provided, what work will be accomplished, and what goals will be achieved over what time period. Creating a logic model is best done in person with all parties present in order to ensure that neutral space is being maintained and that all parties are aware and in agreement with the plan.

Identifying Potential Challenges

A key component of the logic model planning process is to identify barriers and challenges and how these will be overcome. Doing this in advance, when everyone is excited about the project, will provide a starting point for strategies to resolve challenges when they inevitably arise and when stress may preclude clear thinking. All of this, however, builds on the foundation of a relationship and mutual respect for the challenges and goals that each party holds.

For complex relationships, in addition to a contract, a Memorandum of Understanding might help to govern daily, weekly, and less frequent communication, sharing of data and resources, and other potentially challenging issues. The logic model also helps to avert challenges and misunderstandings by confirming 1) that business objectives align with scientific objectives and

2) how success will be measured. What are the metrics of success in accomplishing a goal, and what will happen if the success metrics are not reached? What will be the implication for each of the parties and for the partnership? These are the types of questions an organization and academic must mutually decide and agree upon before beginning their partnership. The answer to these questions varies based on the objectives of both the researchers and business organization. Often the challenges arise through misunderstandings resulting from scientific or business jargon and cultural differences between academics and corporations. From the start, keep an open line of communication whereby any concerns that arise can be discussed and rectified. It is also important to discuss details of ownership upfront before wasting time in negotiations about the core elements of an arrangement. The academic partner should secure their “freedom to publish” in order to allow academic productivity, and clarify intellectual property (IP) relations by securing ownership of findings; this involves including explicit language in contracts and sponsored research agreements to preserve these rights. For more information regarding freedom to publish and intellectual property (IP) relations, see Chapters X. This final point should be explicitly determined within a partnership, as both parties will be providing data and research that is not available to the public. Typically, a partnership involves getting early access to data, or exclusive access to data or resources. For example, through collaboration Dr. Flaura Winston and colleagues have access to next generation safety technology, real-time licensing data, and alerts of insurance claims and police reports for crashes as sources that fuel their research. Special care must be taken to preserve confidentiality and to protect trade secrets, as required by law and agreement with the organization.

The corporate-sponsored research provides the diversity in funding that is necessary to manage the precariousness of federal funding and the long lags between proposal submission and the awarding of funds, which, in the fast-paced technology world, could render research obsolete by the time it is conducted, analyzed, and published. It is important to let the corporate sponsor know that the academic has the intention to submit proposals for multiple sources of funding. This will likely need to be negotiated as the corporate sponsor will have rights to the results and might want to limit, at least in time, the submission of follow-on funding. Regardless, an excellent academic-corporate relationship might provide high-risk funding investments to federal agencies or very applied research that does not advance scientific paradigms. Federal agencies, which are subject to the review by anonymous scientific review committees, might be given the approval to recommend funding for these high-risk investments (e.g., new ideas without feasibility data), but other sources of funding should be considered for time-sensitive research. Alternatively, there are also risks for commercial funding, such as conflicts of interest or a funder claiming intellectual property (IP) rights. Diverse funding can be favorable as long as academic entrepreneurs have a strong publication record.

Framework for Engagement

Finally, ensure that a framework for engagement is established. Partnerships should ultimately be treated like a marriage—all attempts should be made for equal rights and it is wise to test the relationship first before fully committing. Doing a small trial or short-term project first is a good way to determine whether the partnership is one that will continue to succeed or is destined to fail. This short-term project is especially useful to learn if mutually agreed upon aspects of time and communication are present in the partnership. This is vital if the end goal of a partnership is to conduct a long-term or intensive project. In addition, honesty and respect are paramount, for example describing personal goals, such as the requirements for academic promotion. Academic motives are not necessarily more pure than industrial motives and should not be seen as such—both parties, if respect is preserved, should value the other’s needs and challenges and the motives of both the academic and industrial entities need to be in alignment with long-term goals of the partnership. If these motives are not aligned initially, the commercial company could force the academic partners to go in a direction they do not want to go in order to continue to receive funding or access to technology. This can be prevented by making sure that multiple metrics are laid out, such as one, two, and five year goals. Defining these metrics can help ensure success. If the commercial company starts controlling the relationship, the relationship will become more short-term and replaceable once they have the information they need from the academic entity. This can be very stressful for the academics.

Conclusion

This chapter presents aspects of a mutually beneficial partnership, how to create a neutral space, how to make connections with organizations through gatekeepers, the basics of the logic model, the considerations all parties of potential partnerships must discuss prior to beginning the relationship, and the importance of establishing a framework for engagement. Partnerships are most successful when they are mutually beneficial, as it encourages all parties to invest enough resources in order to succeed. A neutral space can be beneficial for gathering insight from several major competitors at once and prevents bias. Gatekeepers are key to finding connections to an organization and are interested in seeking out potential relationships with academic entrepreneurs. The logic model can be used to clearly form a timeline and set of goals for the partnership, as challenges must be discussed prior to beginning the partnership in order to maximize success. Finally, a framework for engagement is the most efficient method for creating a strong and successful partnership. Like any other relationship, communication is the key to a successful partnership. Establish trust by openly communicating goals and interests, and collaborators may be more inclined reciprocate. Building partnerships to solve hard problems can be a challenge. Correctly forming one, however, can ultimately be beneficial for both yourself and for society as a whole.

Resources

1. Managing the Industry/University Cooperative Research Center: A Guide for Directors and Other Stakeholders
 - a. The book *Managing the Industry/University Cooperative Research Center: A Guide for Directors and Other Stakeholders* was written and edited by Denis O. Gray and S. George Walters as a guide to help plan and implement cooperative research.
 - b. Book available on Amazon:
<https://www.amazon.com/Managing-Industry-University-Cooperative-Research/dp/1574770535>
2. Cooperative Research Centers and Technical Innovation
 - a. The book *Cooperative Research Centers and Technical Innovation* written by Denis O. Gray, Craig Boardman, and Drew Rivers provides a good discussion of intermediary organizations as a tool to facilitate cooperation between businesses and other organization in the chapter “The New Science and Engineering Management: Cooperative Research Centers as Intermediary Organizations for Government Policies and Industry Strategies” on pp. 3-33.
 - b. Book and chapter available on Springer:
https://link.springer.com/chapter/10.1007/978-1-4614-4388-9_1
3. 17 Biotech Conferences to Attend in 2018
 - a. The article on AppFluence “17 Biotech Conferences to Attend in 2018” provides an example of various conferences surrounding biotechnology that will occur in 2018. As most conferences are annual, this article may be used as a reference for future conferences as well.
 - b. Article available here:
<https://appfluence.com/productivity/17-biotech-conferences-2018/>
4. Top 30+ Medical Device Conferences You Should be Attending in 2018
 - a. This article on Greenlight Guru “Top 30+ Medical Device Conferences You Should be Attending in 2018” discusses the various conferences occurring in 2018 revolving around medical devices. As most conferences are annual, this article may be used as a reference for future conferences as well.
 - b. Article available here:
<https://blog.greenlight.guru/top-medical-device-conferences>
5. The Cardiac Safety Research Consortium enters its second decade: An invitation to participate
 - a. This article in *ScienceDirect* entitled “The Cardiac Safety Research Consortium enters its second decade: An invitation to participate” provides an overview of the

formation and history of the Cardiac Safety Research Consortium after its first decade in operation.

- b. Article available here:
<https://www.sciencedirect.com/science/article/pii/S0002870316300291>
6. Innovation in innovation: the Triple Helix of university-industry-government relations
 - a. This article in *Social Science Information* entitled “Innovation in innovation: the Triple Helix of university-industry-government relations” written by Henry Etzkowitz focuses on the idea of the Triple Helix, which is composed of the university, industry, and government, and how cooperation is needed to facilitate innovation.
 - b. Article available here:
<http://journals.sagepub.com/doi/pdf/10.1177/05390184030423002>

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