

Guide to Research Partnerships

with Canada's Universities



**GUIDE TO
RESEARCH
PARTNERSHIPS**



Prepared by



**BUSINESS/
HIGHER EDUCATION
ROUNDTABLE**



**Group of Canadian
Research Universities**

Regroupement des
universités de recherche
du Canada

Disclaimer

The information in this document is intended to provide a high-level overview of research partnerships at Canadian universities. No part of this document should be interpreted as representing the policies of an individual institution or constituting the terms an institution might be willing to agree to in any specific case. Furthermore, this document does not constitute legal advice. Please contact a university's research partnership office for institution-specific information.

Use and Sharing of this Document

This document is intended as a resource to facilitate research partnerships across Canada. Accordingly, we are releasing this guide under the Creative Commons Attribution licence so that other individuals or groups can use, improve and adapt it to meet their individual needs. Please credit "the U15 Group of Canadian Research Universities and the Business/Higher Education Roundtable" in any re-use or adaptation of this work.



Table of Contents

Disclaimer	3
Use and Sharing of this Document	3
Introduction	5
About University Research Partnerships	6
Description of Terms	10
Example Research Partnership Term Sheet Template	18
FAQs	20

Introduction

We are in an era where discoveries made anywhere can disrupt markets everywhere. As a result, Canada's ability to turn research into products, services and scalable businesses quickly will increasingly determine our country's competitiveness.

Success in this area requires Canada to have both a world-class fundamental research system and the mechanisms to mobilize the outputs of that system. Research partnerships are an important way to mobilize the talent, discoveries and expertise that fundamental research creates. Compared to other G7 countries, Canadian universities have the second-highest percentage of research funded by the private sector. In 2015-16, businesses invested more than \$888 million in research at Canadian universities. However, in the face of robust global competition, there is a national imperative to strengthen our competitive advantage by further capitalizing on the benefits available through university-private sector partnerships.

In response to that imperative, universities from across Canada have become active participants in the work of the Business/Higher Education Roundtable (BHER). The Roundtable works to make Canada more competitive and prosperous by fostering collaboration among businesses, universities and colleges. This guide to research partnerships is intended to form part of BHER's research partnership toolkit. Our hope is that this guide helps businesses understand what constitutes a research partnership and what to expect during negotiations. The guide also contains a term sheet template, which may prove useful during negotiations. Although the U15 Group of Canadian Research Universities prepared this guide, it is intended to provide an overview that will be largely applicable to research partnerships at all Canadian universities.

About University Research Partnerships

Businesses leverage expertise at universities in a number of ways, including research partnerships, faculty consulting and service contracts. Research partnerships are the most significant way businesses leverage university expertise and are the focus of the rest of this guide. Consulting contracts are usually established directly between an individual faculty member and a business in cases where university equipment, labs and resources are not required. Service contracts are used when a business wants university staff to perform specialized but common analyses, or wants to use the university's state-of-the-art equipment.

University research partnerships (sometimes also called sponsored research or collaborative research) occur when businesses invest in research at a university to solve complex problems. This arrangement allows businesses to capitalize on the expertise and facilities that exist at universities because of Canada's investment in fundamental research. Partnerships may also frequently result in new intellectual property that a business can commercialize.

Partnership Example:

Dalhousie

Challenge

Lithium ion batteries have become ubiquitous in modern electronics. However, they will need to cost less to be commercially viable for mass adoption in electric vehicles and in energy grid storage applications.

Partnership

In 2016, Tesla Motors signed an exclusive five-year partnership with the Jeff Dahn Research Group at Dalhousie University. The research group has trained many of the battery industry's leading researchers including the founders of several successful start-ups. As part of this partnership, the full research group, including graduate students and postdoctoral researchers will collaborate with Tesla's battery technology team.

Research

The objective of the research is to reduce the cost of lithium ion batteries by increasing their energy density and lifespan. Among the major areas the team will be investigating is improved battery materials.

Impact

Although it's too early to determine the full impact of the partnership, some results may be incorporated into Tesla products as early as this year. In addition, Tesla has opened a corporate office in Halifax to further capitalize on the partnership.



How Businesses Use Partnerships

Every business has unique challenges and opportunities. Some common types of partnerships include:

- **Developing leading edge products and services.** When university faculty members undertake fundamental research, they often make world-leading discoveries. These discoveries are at an early stage and are not usually ready for commercial use. Businesses can use research partnerships to advance these early-stage discoveries, turning them into leading-edge products.
- **Developing proof-of-concepts.** Businesses will often identify a new opportunity that is possible, but hasn't been done before. In many cases the barrier to product development is the need to solve a major problem. Businesses can use research partnerships to get a world-leading expert to solve that problem and develop a proof-of-concept that can help secure customers and investors.
- **Improving production processes.** The controls, sensors, materials and systems a business use significantly influence the efficiency of a production process and the quality of its output. Research partnerships give businesses access to experts who can combine leading-edge knowledge with state-of-the-art equipment to find ways to increase the quality and efficiency of a production process.
- **Improving performance.** To increase the ability of drugs to save lives and improve their quality, we need new ways of attacking illnesses and conditions. At the centre of this process is finding new drug targets and understanding a drug's mechanism of action. Research partnerships allow companies to get world-leading experts to develop this foundation for new medicines and other therapies.
- **Solving industry-wide challenges.** Some challenges pose an opportunity (or a threat) to an entire industry. For example, in the forestry industry, finding ways to reforest an area more quickly would benefit all forestry companies as well as the environment. In cases like this, many businesses pool their resources in a research consortium to work with world-leading experts to find new solutions to their common challenges.

Throughout this guide, you will find examples of successful partnerships from BHER member universities. These examples represent a tiny fraction of the countless successful partnerships that occur at universities across the country.



McGill

Challenge

Simulations are increasingly being used for training, mission rehearsal, virtual prototyping, and testing to lower costs and eliminate risks. Making simulators as realistic as possible is the key to realizing these benefits.

Partnership

CM Labs Simulations, Inc. is a leading vendor of simulations, with clients that include Honda and NASA. The company formed a research partnership with McGill University's Jozsef Kövecses, who specializes in the dynamics of mechanical systems, robotics and haptics.

Research

To help make CM Labs Simulations products more realistic, Dr. Kövecses and his team develop physics-based modelling algorithms to simulate real-world factors such as load, cable tension and fast mechanical movement.

Impact

CM Labs Simulations' clients want to simulate increasingly complex machines in realistic environments. The partnership has allowed them to accelerate their development process and helped them stay on the cutting-edge of their field.



Considerations when forming a partnership

When forming a research partnership, it is important to recognize that the mission of universities is to create and disseminate knowledge. This mission drives the educational and research activities these institutions undertake. Whether research is fundamental in nature or undertaken to solve a business challenge, the goal of advancing knowledge and training students lies at the core of every project. This mission influences the kinds of research partnerships universities can form. When a project aligns with the university's core mission, universities can provide an array of resources and infrastructure that lower costs and assist with the project's success.

The actual structure of a research partnership, including its budget and duration, varies depending upon factors such as a business's individual objectives. Project teams may include post-doctoral fellows, graduate students and undergraduate students, as well as other research personnel under the supervision of experienced primary investigators. When developing a research partnership, businesses should consider the following strategic factors:

Strategic questions

Considerations

What business objectives are you trying to meet with this project? How do you intend to use the results?

Finding common ground between a university researcher's need to publish and a business's research goals is a key part of most successful partnerships. In practice, this means that research results that can be published because they don't require IP protection or can be protected some other way (e.g. patent, copyright) are well-suited to research partnerships.

Do you want to interact with the research team during the project? Or just receive periodic reports?

Studies have shown that company involvement in research partnerships results in better project outcomes. The way that interaction occurs varies by project based on the preferences and objectives of the participants.

Do you want the opportunity to engage with graduate students and post-docs who are working on your project? Or just the principal investigator?

Many companies want to work with students and post-docs on their project to assess their 'fit' as potential future employees. Many students and post-docs also appreciate the opportunity to interact with potential employers.

Description of Terms

Research partnership agreements are similar at most universities and contain many of the same sections. Below is a description of the most common sections, as well as an explanation of typical terms.

Project Description and Scope of Work

The most successful partnerships occur when your business's needs align with a researcher's interests and expertise. A critical part of achieving this alignment is to clearly articulate the project's goals and scope of work. Your desired outcomes, timelines, and other objectives (e.g. interaction with students) can all influence the terms of the agreement. In addition, because research results cannot be known in advance, it is important to develop a shared, realistic understanding of the work that the researcher will undertake, the challenges associated with the project, and the likely outcomes.

Partnership Example:

Toronto

Challenge

Like any other natural resources industry, the pulp and paper industry faces a range of challenges including the need to reduce costs, become more sustainable, and increase demand.

Partnership

In 1987, the University of Toronto opened the Pulp & Paper Centre to facilitate industry partnerships. The Centre has worked with almost 50 industry partners to date.

Research

The consortium model has allowed the Centre to undertake research in seven different areas that are crucial to the pulp and paper industry. These include energy and chemical recovery, environment, bio-energy, bio-products, lignocellulosic fibres, biotechnology and feedstock sustainability.

Impact

Over the last 30 years, the Centre has conducted hundreds of studies, contributing substantially to the overall knowledge base within the industry. Several of these studies have led to significant breakthroughs, including the design of a dramatically more energy efficient sootblower nozzle. The improved nozzle is now installed in more than 95 percent of recovery boilers worldwide, saving the industry an estimated US\$100M per year.



Total Project Costs

University research partnerships are a cost-effective way to undertake many types of research projects. Generally, when negotiating a research partnership, there are two types of costs to be agreed to: direct costs, and facilities and administration costs (F&A). Direct costs are expenses that are easily attributable to the project – graduate student salaries, materials, and so on. The time faculty members spend on a project is often covered by the university, creating a significant cost savings for businesses. F&A costs (sometimes also called indirect costs or overhead) refer to a wide range of other research-related costs that a university incurs but can't attribute directly to any individual project. These costs include items like lab maintenance, utilities and support staff salaries. Typically, facilities and administration costs are calculated as a percentage of direct costs. Although audits have found actual overhead costs to be about 60 percent of direct project costs, Canadian universities generally absorb some of these costs and charge business partners a significantly lower overhead rate.

Payment Schedule

The invoicing and payment schedule is negotiated based on the nature and duration of the project. Typically, the university will want payments in advance of the performance of work, on a periodic basis. However, in some cases, other approaches may be possible.

Reports

Your business objectives will dictate the amount of on-going engagement you desire with the team working on your project. In addition to informal interaction, you will also receive formal reports about a project's progress. These reports usually include information about discoveries or IP resulting from the project. University researchers submit these status reports on a schedule that is appropriate for your project, followed by a final report at the end of the project.

Intellectual Property (IP)

Deciding how to handle the intellectual property associated with a research partnership is one of the most important aspects of a negotiation. Both the business and the researcher often have existing IP (also known as background IP) that they bring to the project. Foreground IP, sometimes called arising IP, is intellectual property that results from the project. Ensuring that both you and the researcher feel that their background IP is protected and that they can benefit from any foreground IP is at a key component of a good research partnership.

Background IP

Background IP refers to any intellectual property based on prior work that you or a university researcher brings to the project. This can include existing designs, patents, code, or other intellectual assets. Generally, both a business and a university grant each other research-only licences to background IP for the duration



Waterloo

Challenge

Technology that improves blood circulation in the lower legs has the potential to better prevent and treat blood clots and reduce muscle fatigue. This technology could provide important advantages to the elderly, sedentary office workers, athletes and soldiers.

Partnership

In 2012, Lockheed Martin asked a research team at the University of Waterloo to develop a technology to increase blood flow from the lower legs to the heart for more oxygen.

Research

The research team developed a sleeve that fits around a person's calf. The sleeve has five air pockets that compress in a sequence that is synchronized with the wearer's heart beats, to push blood upwards from the ankles. This technology has been shown to increase blood flow by 143 percent.

Impact

This successful partnership has resulted in the creation of a new business called Pression. Pression, based in Canada, is commercializing the compression technology for military, athletic and medical applications.



of a project. To protect all parties, it is important for both you and the researcher to identify and document any background IP that may be required to complete the project. Depending upon the circumstances, the agreement could also grant you a licence or an option for commercial rights to the university or researcher's background IP. When a project is intended to improve your company's background IP, many institutions may agree to assign foreground IP to your company.

Foreground IP - Ownership

When negotiating IP ownership, it is important to consider whether you need to own the IP or only require the rights to commercialize it. There are four major approaches to ownership: creator-owned, jointly owned, sponsor-owned, or university-owned. Many factors will influence which approach best suits your agreement. Factors to consider include whether one sponsoring business or a consortium is undertaking the project; how much of the cost of the research the business or consortium is funding; the individual university's policies regarding IP ownership; and the nature of the project's anticipated foreground IP.

Foreground IP - Commercialization Rights

From a business perspective, IP commercialization rights are often one of the most important aspects of a research partnership agreement. Your business objectives, whether you are funding the full cost of the research, and other factors all affect the terms to which you and the university can agree. Among the possible arrangements are a licence for commercializing foreground IP or an option to license foreground IP. These can be either an exclusive or a non-exclusive right. Depending upon your business's needs, as well as other considerations, any of these rights and options could be defined or limited in terms of time, field of use, or other mutually agreed-upon factors. Although it can vary depending on the institution and project, typically, institutions want some form of compensation in exchange for an exclusive commercial licence (e.g. royalty, lump-sum payment, or in-kind contribution).

Foreground IP - Retained Rights

As noted above, creating and disseminating knowledge is a university's core mission. Accordingly, when it comes to the results of research partnerships, a university will generally retain perpetual non-commercial rights to use all foreground IP resulting from the project in teaching and further research, regardless of how other IP rights are structured.

Partnership Example:

Regina

Challenge

As people, organizations and governments generate more and more data, the opportunity exists to leverage this data to improve government policies and services. To be useful for policy and decision-making, it is necessary to turn millions of data points into actionable insights.

Partnership

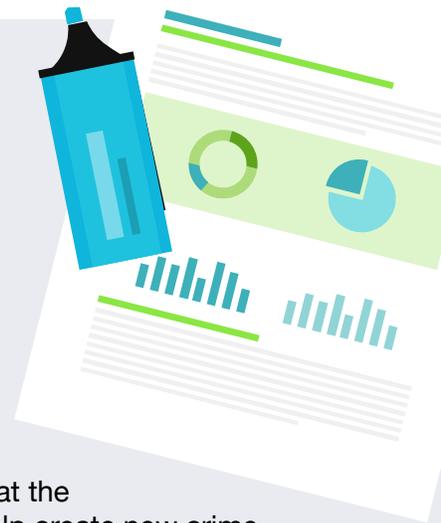
ISM Canada, an IBM subsidiary, formed a partnership with a team of researchers at the University of Regina to help Saskatchewan's Ministry of Justice use big data to help create new crime reduction initiatives.

Research

The team conducted several analyses to identify models that could help ISM Canada's clients develop effective crime reduction policies. The team used both social media analytics and correlations between different crimes occurring in similar locations.

Impact

The data mining and visualization system is an important tool to support crime-reduction programs.



Confidentiality

Before sharing background IP or other sensitive information, businesses, as well as universities and researchers, often want assurances that their partners will keep the information confidential. Usually, all parties are happy to commit to keeping each other's proprietary information confidential. Confidentiality agreements also prohibit a researcher from including your proprietary information in any publication of research results.

Publication

Publishing research results is an important way universities advance their knowledge creation and dissemination mission. It is also essential for graduate students to complete their degrees and for post-doctoral researchers to advance their careers. However, universities also recognize the competitive realities businesses face. To help balance these interests, universities and researchers will usually agree to give you an advance copy of any publication resulting from partnered research. This gives you time to verify that your confidential information is not being published and that there aren't any surprises in the publication. Partnership agreements can also allow for a publication delay to allow a reasonable period of time to file for a patent. Typically, the maximum length of a publication delay is six months.

Student Theses and Research Projects

Students may be heavily involved in research partnerships and use elements of the research they participate in as part of their theses or other research projects. Given the importance of ensuring that students are able to graduate on time and join the workforce, student thesis or report submission cannot be delayed. In cases where this disclosure is problematic for your business, thesis defences can often be conducted privately and kept confidential for a reasonable period of time. The maximum length of time a thesis can be kept confidential varies by institution. Similar confidentiality measures are available for other student research projects.

Participant Agreement

One of the benefits of a research partnership is that students and post-doctoral fellows may work on your project under the leadership of an experienced principal investigator. This lowers your costs. It also allows you to observe potential future employees in action. Any students or post-docs who participate in your project may be required to sign an agreement indicating they understand and will abide by the terms of the contract, especially regarding confidentiality and IP rights. In some cases, principal investigators may also be required to sign a similar agreement.

Calgary

Challenge

The advanced imaging capabilities of MRI machines, when coupled with advanced robotics, could make surgery less invasive and more precise. To realize this potential, MRI-compatible robots need to have the dexterity of human hands, be made entirely of MRI-compatible materials, and provide surgeons with a sense of touch (intuitive haptic feedback).

Partnership

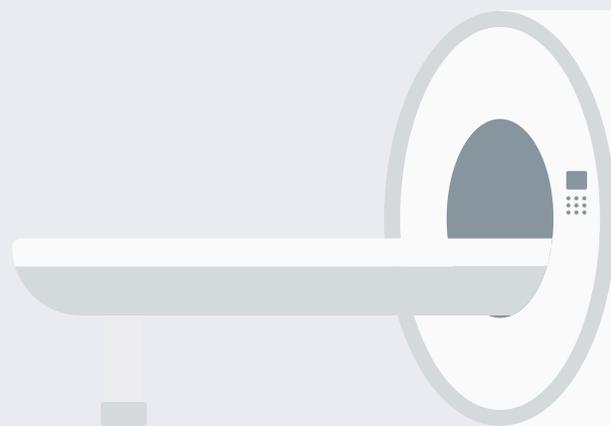
At the University of Calgary, Dr. Garnett Sutherland, a neurosurgeon, worked with MacDonald, Dettwiler and Associates (MDA) to create the neuroArm, a robot that can conduct brain surgery within an MRI machine.

Research

The team built on lessons learned from developing the Canadarm2 and Dextre on the International Space Station to create this surgical robot. In 2008, surgeons using the neuroArm successfully removed a complex brain tumor from a young woman.

Impact

The neuroArm continues to be developed through academic/business research partnerships. It has now been used on more than 70 patients and the technology has been translated for commercialization. MDA is also building on this research to develop other medical robotic systems.



Publicity

As public institutions, universities need to report on their activities to governments, and as part of broader community outreach. Because of these obligations, universities generally retain the right to publish the name of the companies they work with, and some basic information about their projects (e.g. project title, name of the researcher, funding received). However, they will not disclose any of your confidential information. Usually, the partnership agreement will state that the university will discuss any further promotional opportunities with you in advance.

Equipment

Sometimes a university needs to buy new equipment or other capital assets as part of the proposed project budget. Generally, the university retains ownership of these assets once the project is complete.

Special Material Handling, Training and Security Requirements

Research projects may involve controlled materials, animal care or require participants to have specialized training or security checks. Although universities have the facilities and expertise required to handle many of these special requirements, each case is unique. Further, under ordinary circumstances, faculty members or students do not undergo security checks. Accordingly, if your project involves special material handling, training or security requirements, you should inform the university as early in the negotiation as possible. This advance notice will give the university time to work with you to ensure it meets these requirements. Generally, universities will not accept responsibility for compliance unless a business partner has outlined the specific controls or other measures it requires.

Partnership Example:

University of British Columbia

Challenge

When someone fractures their pelvic ring, the pieces need to be repaired and held in place until the injury heals. Existing methods for repairing pelvic ring fractures require lengthy surgery and can result in painful, suboptimal bone fixation that slows recovery and contributes to long-term disability.

Partnership

CurvaFix licensed a University of British Columbia (UBC) and BC Cancer Agency (BCCA) invented orthopaedic implant for treating pelvic ring fractures that will lower costs and improve patient outcomes. The company is now partnering with the institutions to undertake additional research and development to bring this device to market.

Research

Researchers at UBC and BCCA have been prototyping, bench testing, cadaver testing and animal testing the device since 2012. In the near future, UBC faculty at Vancouver Coastal Health Authority will be conducting the first human studies.

Impact

The UBC/BCCA research has helped develop and validate this medical device. Based on the business's progress, the team recently raised \$2.5M USD to develop it and prepare for commercialization.



Representations, Warranties, Indemnification and Liability

Sometimes, businesses ask universities to provide assurances that the IP is unencumbered by any other IP or is suited to a particular purpose. Universities understand the desire of a business to minimize risk. However, universities provide all project results “as is” and will not guarantee that the project results don’t infringe others’ IP or are suitable for any particular use. Furthermore, universities will want your business to indemnify them for any damages resulting from your use of the IP because your business controls your use of the research results.

Termination

Unfortunately, research projects sometimes need to be cancelled, for various reasons. Partnership agreements allow either party to terminate the agreement within a set notice period. Usually, an agreement specifies that the university will be reimbursed for any work completed and for non-cancellable commitments.

Governing Law and Dispute Resolution

Similar to most other legal agreements, partnership agreements usually state which jurisdiction’s laws should be used to interpret the agreement and identify procedures for resolving any disputes. These are usually standard clauses. Universities typically prefer to use the laws of their own province.

Example Research Partnership Term Sheet Template

	Item	Terms
1	Project description and scope of work	
2	Total project costs (include direct and indirect costs, and expected/sought supplementary funding)	
3	Payment schedule	
4	Reports (technical and/or financial)	
5	Background IP	
6	Foreground IP ownership	
7	Foreground IP commercialization rights (options, licensing rights etc.)	
8	Foreground IP retained rights	

	Item	Terms
9	Confidentiality	
10	Publication	
11	Student theses and research projects	
12	Participant agreement	
13	Publicity	
14	Equipment	
15	Special material handling, training and security requirements	
16	Representations, warranties, indemnification and liability	
17	Termination	
18	Governing law and dispute resolution	

FAQs

How long does it take to negotiate a research partnership?

In many cases the scope of work, budget and other elements of a partnership agreement can be negotiated in two or three months, although a variety of factors may affect this timeline. Recently, one large university examined the factors that influenced the length of time it took to negotiate an agreement. Not surprisingly, it found that negotiations were quickest in cases where either the business's or university's standard agreement could be used with a relatively small number of changes. In addition, involving industry liaison officers early in the process can help avoid unnecessary delays.

How fast can my project get started? When do I get my results?

If the project needs to meet specific timelines, it's important to discuss those with the partnership office's industry liaison as early in the process as possible. The project can only get started once the agreement is signed. Once the agreement is signed, the university begins allocating lab space, graduate students, and so on. Often these resources and people can be mobilized quickly, but in some cases lab space and graduate students might not be available immediately. Seeking supplementary funding from government sources (such as NSERC, SSHRC, CIHR and/or their various provincial counterparts), while financially advantageous in many cases, may require additional time.

I've already agreed to the project's details with the researcher. Why do I need the partnership office to be involved?

The partnership office is responsible for ensuring that all university policies (e.g. ethics review, publishing, risk, and overhead rates) are considered. The office is also the university's contracting authority for research partnerships. It is important to be aware that only the university partnership office, and not individual researchers, can commit the institution and its resources in terms of equipment use, liability, and other factors. Accordingly, to avoid any surprises, it is best to involve the partnership offices as early in the process as possible.

Can a professor, as university representative, sign an agreement?

No, the signing authority lies with the university's office of partnerships or other designated official.

The university says it can apply for external funding to leverage our “in-kind” contributions. What is eligible “in-kind”?

The eligibility and the amount of in-kind contributions a university can leverage varies by funding source. However, in most cases, facilities, equipment, supplies, technical services, or R&D staff time can all qualify as in-kind contributions from industry.

Will company employees be allowed on-site in the university’s labs?

The presence of company employees is determined on a case-by-case basis. In cases where company employees are allowed into labs, the company remains responsible for all actions of the employees and the employees must agree to be bound by certain university policies. Depending on the extent of the company employee(s) involvement in lab activities, the university may ask the company to sign a visiting scientist agreement.

If the research results in IP, can my team be involved in the process of protecting it or do I need to leave it to the discretion of the university?

If the details of how any foreground IP is protected are important to you, or to your business objectives, you should discuss that with the partnership office’s industry liaison when you negotiate your partnership agreement. Generally, universities are happy to work with your team to make sure they meet your needs.

If I’m paying for the research project, why should I also have to pay royalties on associated IP?

Typically, research partnerships involve the university absorbing a significant share of the costs and rely on IP or knowledge that was developed outside the partnership. As a result, universities may ask for a royalty or for other consideration in exchange for the right to commercialize foreground IP. In addition, royalties also help align the interests of the research team and the business partner.

If my company would like to have testing done by the university with no research involved, do we still need to sign an agreement?

Yes. This would be considered a “service agreement.” Service agreements can be much shorter and simpler than research partnerships. If you are interested in exploring a service agreement, we recommend you contact a research partnership office.

**GUIDE TO
RESEARCH
PARTNERSHIPS**



UNIVERSITIES

