



The Innovator's Handbook

**A GUIDE FOR GRADUATE STUDENTS
AND POSTDOCTORAL FELLOWS**

FACULTY OF GRADUATE
STUDIES AND RESEARCH

2022



**UNIVERSITY
OF ALBERTA**



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QUESTIONS? CONTACT US!

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Innovation for Everyone

There are countless stories about organizations that change the world through revolutionary, out-of-the-box thinking. But does everybody have what it takes to be that kind of visionary? Don't the leaders of innovative organizations possess special qualities?

Here's a secret: *Everybody* can be an innovator. It doesn't matter what your degree is in or what you're working on. You can be an innovator because the fundamental concept behind innovation is quite simple.



What is Innovation, Anyway?

Innovation is simply **doing something that is new or better than what already exists**. It's a broad definition for good reason, as innovation can be found in many forms, including:

- **Product** (such as new inventions, drugs, software, or artwork)
- **Policy** (such as new regulations or rules in an organization)
- **Process** (such as new strategies or protocols)
- **Practice** (such as new business models, collaborations, or ways to interact with the community)

Innovation doesn't necessarily mean patents or inventions—an artist may be interested in a new method for selling their artwork, for example. And it isn't necessarily commercial, either—a student or postdoctoral fellow may develop a new way to take and sort notes for their research.

Innovation is not solely the domain of engineers and scientists. Multidisciplinary collaborations are inherently innovative. For example, a marketing specialist may help a computer scientist develop a plan to commercialize a new app. An economist can help a doctor understand the economics behind a possible new drug. A musician might work with an engineer to improve acoustics in a space.

The possibilities for innovation are limitless. The problem is that not everybody knows how to get started.

How Do I Use This Book?

There is no one right way to innovate. Innovation will be a different process for everybody. This handbook is a starting point, not a complete how-to guide.

The book is divided into sections that cover common questions students might have about innovation. We explain the University of Alberta's intellectual property framework, where to find helpful resources in the community, and what kinds of questions you should ask your mentors and supervisors.

The purpose of this book is not to encourage you to get more patents. Nor is it meant to encourage you to commercialize something. The goal is simply to show you that everybody—regardless of their degree—can be an innovator, and to empower you to make informed decisions about what to do with your ideas.



CAMPUS INNOVATOR: FUTURE FIELDS

Matthew Anderson-Baron obtained his PhD in cell biology at the U of A. During his graduate studies, he fell in love with the concept of cellular agriculture. The idea of cultivating meat without the need to farm animals was particularly exciting to him, as it would be a novel application of the techniques and skillset that he acquired during his PhD studies. When he started his postdoctoral fellowship, Matthew co-founded Future Fields, a research-and-development cellular agriculture company aiming to commercialize cultured meat in Canada.



Intellectual Property

At some point, you might create something innovative, but you might not be sure how to protect the idea.

This is why it is important to understand how the university's intellectual property and commercialization policies affect you as a graduate student or postdoctoral fellow.

What is intellectual property? Why is it important? How does the university work with innovators and their intellectual property? This section aims to demystify some of those questions.





What is Intellectual Property?

During your studies as a graduate student or term as a postdoctoral fellow, you will likely create **intellectual property** (IP). IP is the product of intellectual activity that can be protected to some extent by law.¹ This includes inventions, software, trademarks, and creative works.

If you thought it (and you created it), it's IP.

Why Are the IP Policies Important?

As a potential creator of new IP, and as somebody who may decide to commercialize it, you should understand how the IP policies at the U of A affect you and your research.

These university documents specifically apply to IP in a graduate-study and postdoctoral setting:

- [Patent Policy](#)
- [Commercialization of Patentable Intellectual Property Procedure](#)
- [Intellectual Property Guidelines for Graduate Students and Supervisors](#)
- [Introduction to Creating a University of Alberta Spin-Off Company](#)
- [University of Alberta Spin-Off Company Toolkit](#)

These policies can be found online through the University of Alberta Policies and Procedures Online Database (UAPPOL) and through the Graduate Program Manual on the Faculty of Graduate Studies and Research website. The introduction and toolkit for creating a University of Alberta spin-off company can be found on Technology Transfer Services website.

This section breaks down the most important parts of these documents to help you understand how the policies might affect you and your research.

1. University of Alberta (2004). *Intellectual Property Guidelines for Graduate Students and Supervisors*. p.5

What is TTS?

Technology Transfer Service (TTS) Office is officially responsible for commercialization agreements between the inventor and the university, and between the university and companies/ licensees. They can help you understand IP policies, formulate an IP strategy, secure IP protection, negotiate IP-related agreements, and create a spinoff company (if you so chose).

TTS is the recommended resource for any IP matters arising from your studies or your employment at the university. You can find their main offices at Enterprise Square in downtown Edmonton.

IMPORTANT NOTE

This chapter seeks to interpret the IP policies at the university but **does not** supersede them. The university's policies and procedures are not permanent and may change in the future.

The guidance and suggestions in this chapter are based on the policies published at the time of writing. If there are conflicts or contradictions between the policies and what's written in this book, the policies and procedures in the UAPPOL will be deemed correct.



What Do All These Words Mean?

The following definitions will help you understand IP policies and related matters:

Assignment of IP: As the owner of the IP, you may choose to transfer IP rights to another party. The party that is assigned the IP becomes its new owner.

Commercialization: The process of making and/or taking a product or service to the market for profit.

Copyright: The exclusive right of the creator (or whoever holds the copyright) to reproduce a work. It does not protect an idea, but rather how the idea is *expressed*. Researchers and students usually hold the copyright to their own publications. However, if you are conducting research as an employee of the university (such as a research associate, research assistant, or lab technician), copyright usually goes to the university.²

Equity: In this context, stocks or other securities that represent ownership interest, generally in a company.

Patentable invention: Something that is new, useful, and not obvious for somebody with a similar skill set to develop. Inventions include many things, from new devices to new chemical compounds, new uses or processes, and even new life forms.

Inventors: Individuals who create inventions. As a student or postdoc, you may be looking to publish something related to your invention, but not all authors who are listed as contributors to academic publications may be inventors. The university's Report of Invention (ROI) form can help you sort out who the inventors are.

Patents: These protect inventions—things that are new, useful, and not obvious. They give the inventor the exclusive right to make, use, or sell the patented invention for 20 years from the date of issue and allow the inventor to sue those who infringe on those rights.

License: This extends the IP rights to another party, giving them the ability to also make, use, or sell the IP.

2. Intellectual Property Guidelines for Graduate Students and Supervisors. p.8

What Are the Differences Between Revenue, Royalties, and Equity?

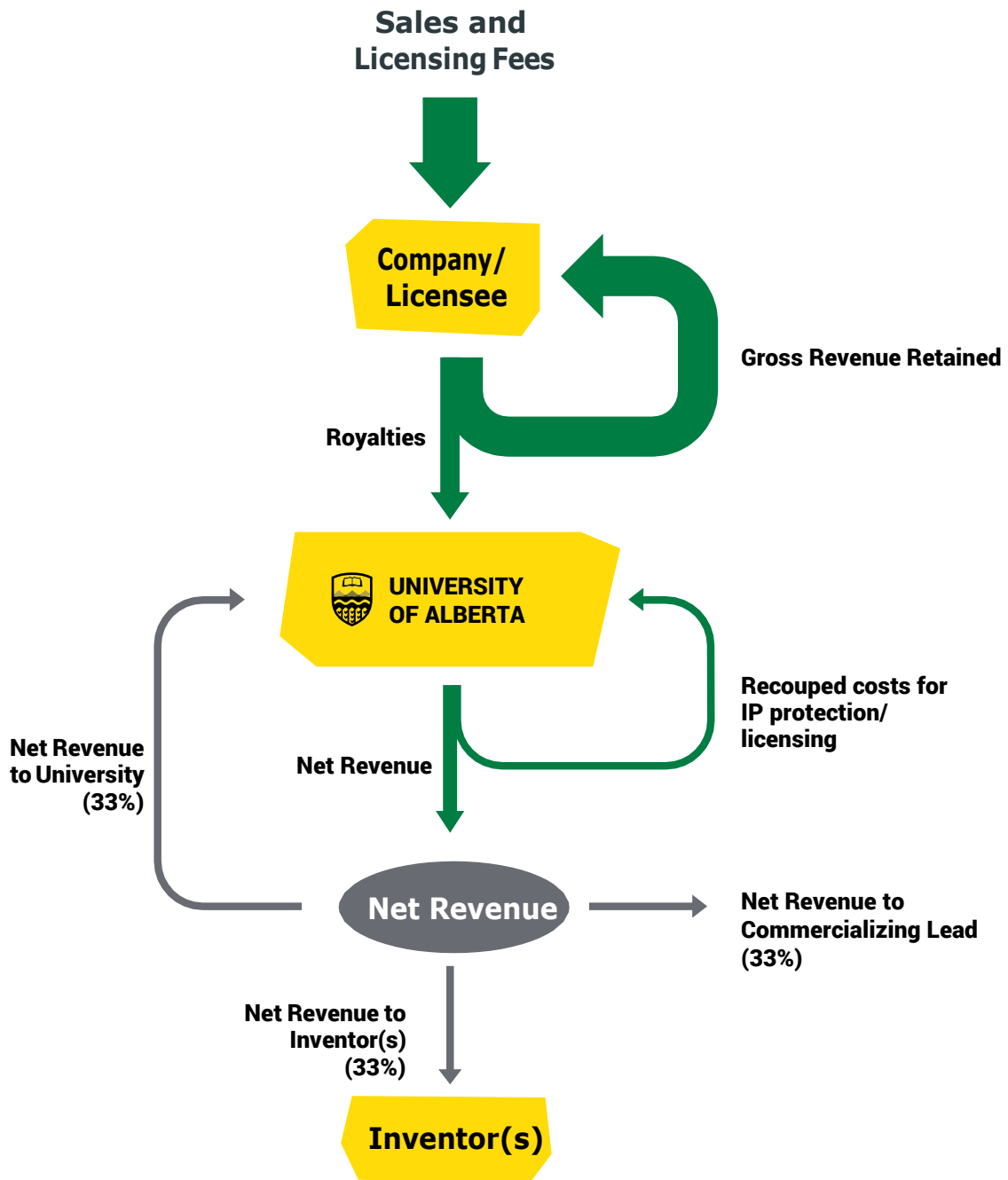
The meanings of these terms can conflate different concepts that are related but not quite the same.

It may help to understand the relationship between revenue and royalties. The term **revenue** generally refers to money that comes to any entity through sales, fees, and similar avenues. For a company or licensor, **gross revenue** consists of all the money that comes in from sales and licensing fees. Companies may have more than one product or service from which revenue is generated.

When a university-created technology is licensed to a private company, the university may collect a **royalty**, which is a percentage of the gross revenue (negotiated between the company/licensor and TTS). Royalties are calculated from the gross revenue generated with the *licensed technology*, not the overall revenue of the company.

Net revenue, when referred to in the Patent Policy, is money collected by the university or inventors from the company/licensee. In other words, it is the *royalty* the company/licensee pays to the university, minus the cost of IP protection and licensing (such as filing patents or out-of-pocket costs of granting or enforcing a licence). As per the Patent Policy, this net revenue is shared between the university and the inventor(s): one-third to the university, one-third to the inventor(s), and one-third to the one responsible for commercializing the invention (the *commercializing lead*).

NET REVENUE SHARING MODEL



As you can see, most of the money generated by the company or licensor is retained; only the royalties paid to the university are shared through the three-thirds scheme outlined in the Patent Policy. The portion of the net revenue shared with the inventor(s) is usually divided among all inventors.

If you are planning to create a spinoff company, you should also consider how **equity** (ownership of the company) is shared. Equity is different from revenue and is an important consideration when raising capital from investors in the future. Equity influences how much each shareholder receives when the company is sold, as well as how much say they have in the direction of the company as it is growing.

What's a Spinoff Company?

Spinoff companies are legal entities that are separate from the university. They meet three key criteria:

1. A significant portion of their commercial activities (e.g. sales) will come from the invention, be it an application or a business model surrounding it.
2. They are not controlled by the university. The university may, however, have a non-controlling equity or royalty stake in the company.
3. They have signed a relationship agreement with the university to address potential conflicts of interest if university staff are involved with the spinoff.

You may choose to create a spinoff company instead of a licensing agreement with an existing company, to commercialize your invention.



CAMPUS INNOVATOR: ROSHAN WATER SOLUTIONS

Roshan Water Solutions is a startup committed to assuring the safety of drinking water while protecting the environment. It was founded in 2017 by U of A alumni Parmiss Mojir Shaibani and Amirreza Sohrabi. Their innovation is a field sensor that detects *E. coli* in water. The idea originated during Parmiss' PhD project, which involved water management in rural areas in India and Canada. When the project showed potential for use outside the lab, the team took the idea to the next level by creating this startup company.



I Made an Invention! Now What?

First off, congratulations! There are a few options to consider, depending on what you hope to do with your invention.

The first step, no matter what, is to report the potentially patentable technology to the university. To do so, you must submit a fully signed Report of Invention (ROI) form to TTS.

It is highly recommended that you report a potentially patentable invention as early as possible, even before you submit a proposed publication or an abstract to a conference for consideration.

The university's policies on patentable IP are inventor-centric. As the inventor, you—and your co-inventors—own the invention and get to choose what you want to do with the new IP (certain exceptions apply, as noted in the Patent Policy). You must decide:

1. Do you want to **license** the technology, or create a **spinoff company** to commercialize it?
2. Do you want to **assign** ownership of the IP to the university for commercialization, or do you want to **keep** ownership of the IP?

Each option has its own considerations to keep in mind as you move forward with commercializing your idea.

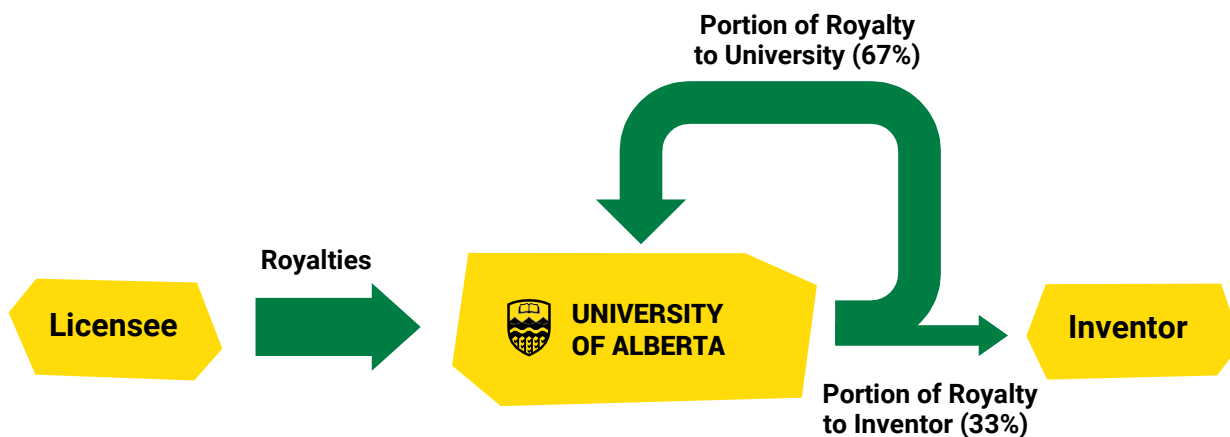
How Does Licensing Work?

Licensing means that the invention is commercialized by giving third parties the rights to make, use, and sell it. The licensee (the one who gets the license) pays a royalty fee to the licensor (the one who gives the license).

Licensing can either be done **independently** (where the IP is retained by the inventors) or **assigned** to the university, which will conduct licensing activities on the inventors' behalf. The Patent Policy commits a third of the royalties to the commercializing lead. This means whoever leads the licensing (be it you or the university) will be the one who receives the remaining third of the royalties.³

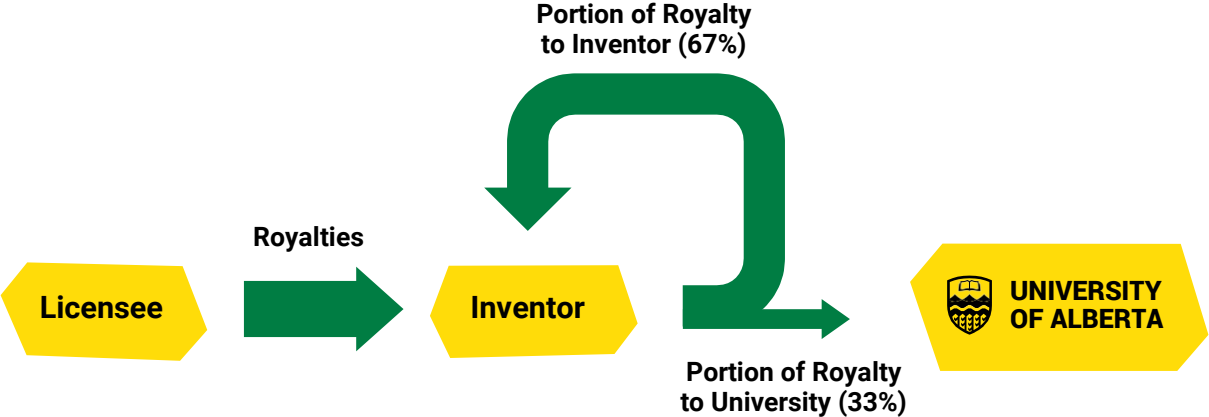
³ University of Alberta (2007). Patent Policy. § 9

LICENSING THROUGH THE UNIVERSITY



Licensing Through the University	Inventor	University	Licensee
Receives commercialization rights under license			✓
Responsible for commercialization			✓
Responsible for licensing, liability, patent application, etc.		✓	
Responsible for negotiating with licensees		✓	
Owns IP		✓	
Royalties shared	33%	67%	

LICENSING INDEPENDENTLY



Licensing Independently	Inventor	University	Licensee
Receives commercialization rights under license			✓
Responsible for commercialization			✓
Responsible for licensing, liability, patent application, etc.	✓		
Responsible for negotiating with licensees	✓		
Owns IP	✓		
Royalties shared	67%	33%	

How Does a Spinoff Company Work?

You may decide that the invention has more value as part of a **spinoff company** than through licensing to an existing entity. Although a spinoff is legally separate from the university and the inventor, the inventor generally stays with the spinoff as a founder.

You may choose to transfer your IP to the spinoff **independently** (where IP is retained by the inventors) or **assign** it to the university.

Regardless of which option you choose, spin off companies (and the inventors who founded them) are still responsible for the following:⁴

- Submitting a completed Report of Invention (ROI) to TTS
- Submitting a business model summary of the spinoff, including a description of potential products, possible market opportunities, and who the founder(s) are from the university
- Incorporating the company—ideally with legal, accounting, and insurance advice
- Paying for all IP and commercialization expenses (unless you assign to the university, in which case the University will cover the cost for the first patent application)
- Fulfilling financial and progress reporting requirements to the university through TTS

4. Creating a University of Alberta spin-off company. 2022 <https://www.ualberta.ca/research/innovation/tech-transfer/spinoff-process.html>



SPINOFFS THROUGH THE UNIVERSITY AND TTS

If you choose to **assign the IP to the university** and form a spinoff, TTS can assist with licensing the technology into the spinoff and connect you with resources to support company creation. By going with this route, TTS will complete a patentability assessment, file a patent application, and pay for the initial filing fee. They will also draft the agreements needed between the university and the spinoff which may include a term sheet and license, shareholders', and relationship agreements.⁵

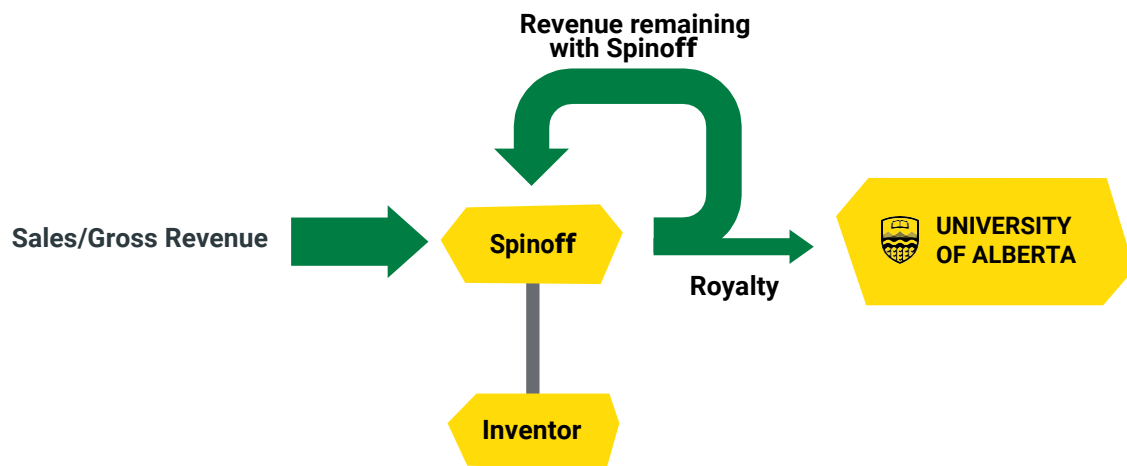
As part of the deal structure you negotiate with the university may take a **non-controlling equity stake** in the company. This means the inventors keep most of their shares and remain in control of the company. The university may also take a small royalty, as described earlier in this chapter.

As of the date of this document, TTS has established a number of company-friendly, investor-friendly standardized spin-off deal structures to help reduce the time, complexity, and cost of negotiating deal terms. Standardized spinoff deal structures offer inventors the choice of compensating the university through either royalties or equity, or a weighted blend of both. TTS's technology management team can provide more information on the standardized spinoff deal structures.

5. Creating a University of Alberta spin-off company. 2022 <https://www.ualberta.ca/research/innovation/tech-transfer/spinoff-process.html>

Spinoffs Through the University	Inventor	University	Spinoff
Responsible for commercialization	✓		✓
Receives commercialization rights under license			✓
Owns IP		✓	
Equity shared (dilutive)	Negotiable	Negotiable	Negotiable
Royalty paid by spinoff to university	Negotiable	Negotiable	Negotiable

COMMERCIALIZING INDEPENDENTLY



You may choose to **keep ownership of your IP** (as allowed under the Patent Policy). The inventor may choose to license to an existing entity or assign their IP to the spinoff company for commercialization. Through TTS, the university must approve of the transfer, and you must still negotiate compensation to the university.

Even if you choose to go the independent route, you have the same obligations to the university, as outlined earlier in this section. As an independent, the spinoff is also responsible for all patenting costs, including the initial patent-application filing.

Spinoffs Independently	Inventor	University	Spinoff
Responsible for commercialization	✓		✓
Receives commercialization rights under license			✓
Owens IP	✓		
Equity shared (dilutive)	Negotiable	Negotiable	Negotiable
Royalty paid by spinoff to university	Negotiable	Negotiable	Negotiable
Royalty shared (depending on inventors' choice of deal structure)	N/A	N/A	

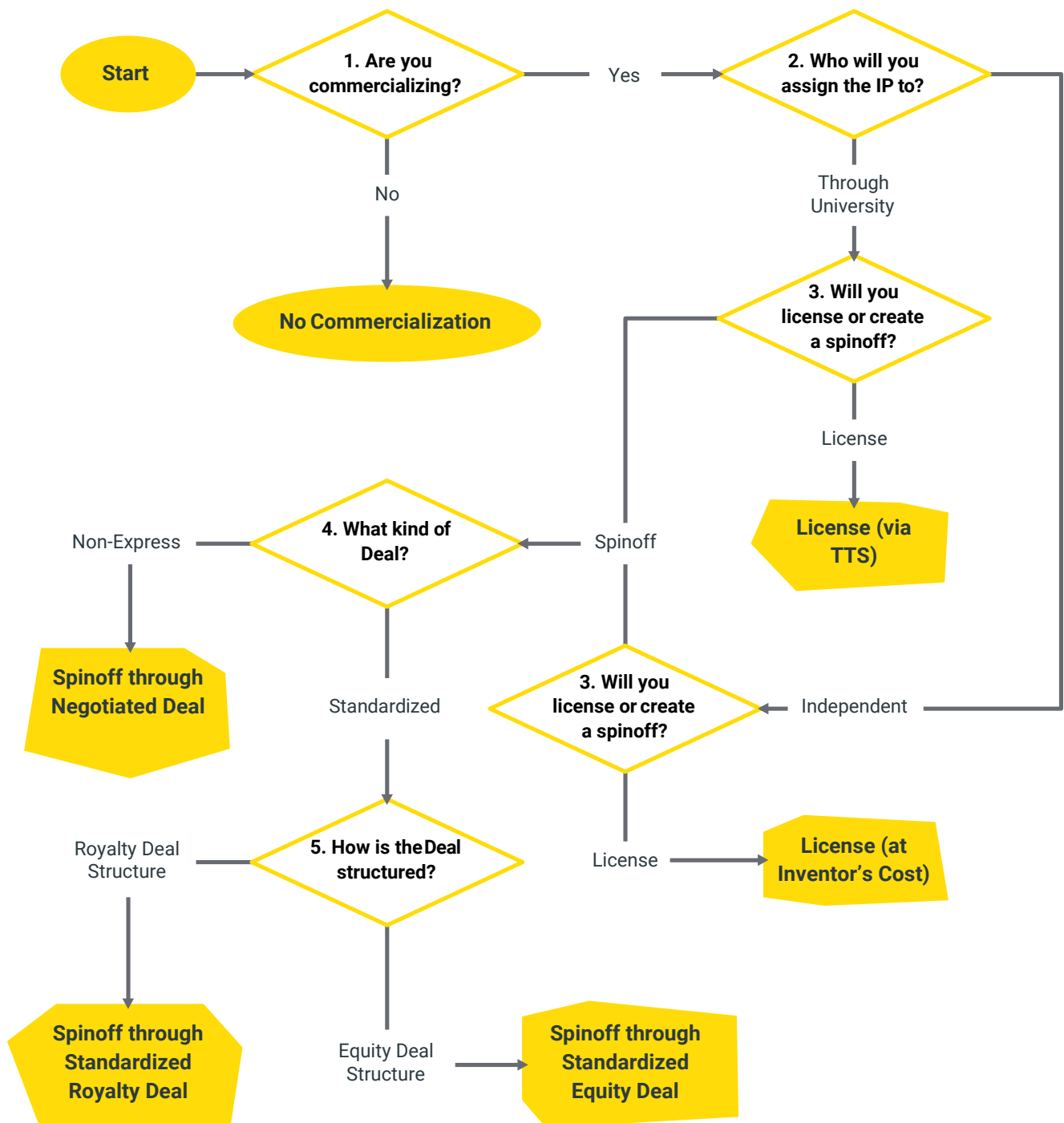
BUT IT'S MY INVENTION!

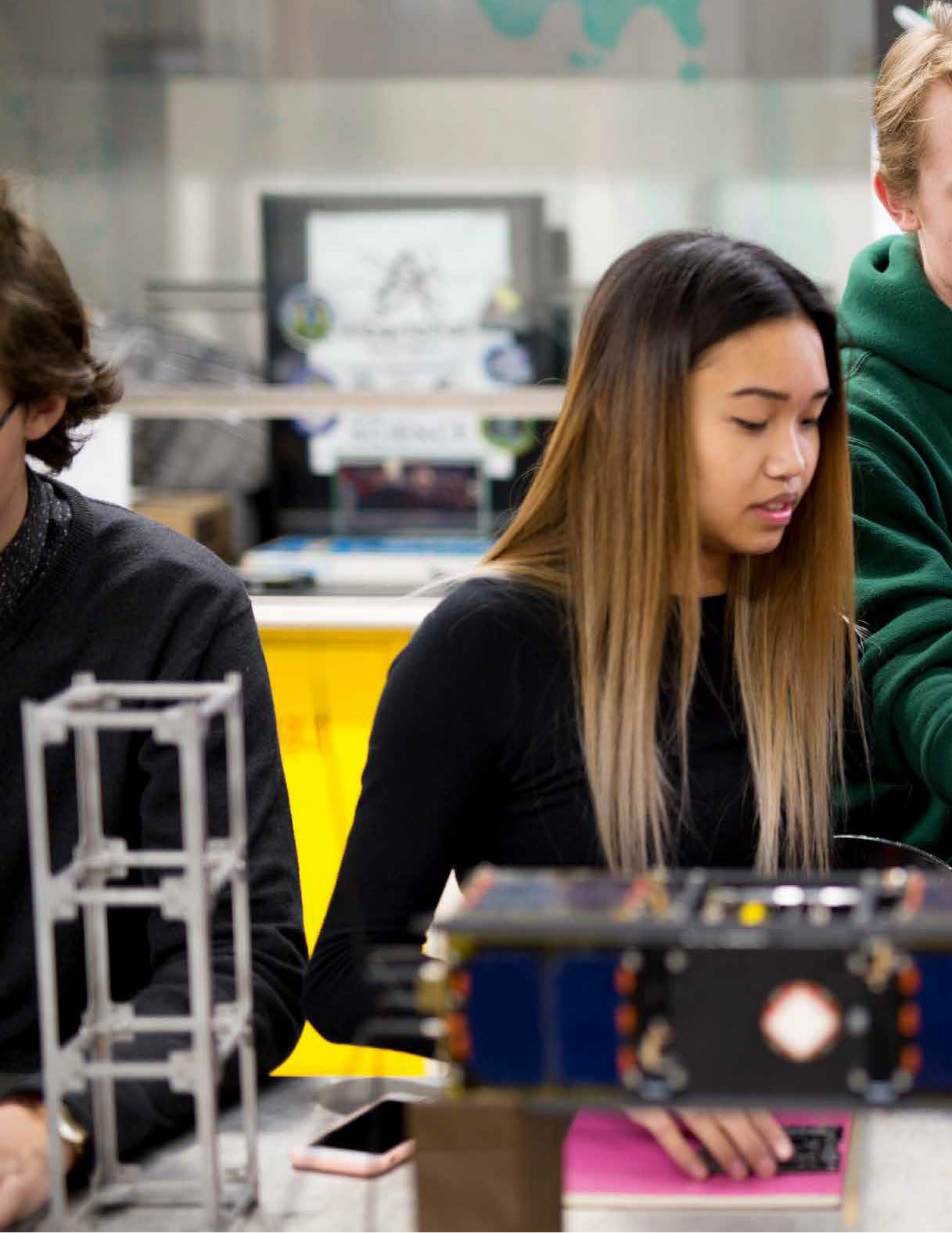
It may seem strange that the university takes a portion of the net revenue or spinoff equity no matter what you do. Keep in mind, however, that the university also invested in the creation of the IP by providing space, resources, equipment, and money (such as salary or stipends) to the inventors as they were working on the invention.

The invention was also likely funded with public grants. The university is mandated to ensure a portion of commercial proceeds from this investment is reinvested into further research and commercialization.

The Choice is Yours

As you can see, there are many choices you can make with new patentable IP. What's next is up to you! Depending on how much you want to get involved in commercializing your new invention, one of these routes may appeal more to you. If you're not sure, you should speak with TTS to discuss your options.







It Takes a Village

Very rarely does groundbreaking innovation happen from the work of a single person. Ideas flourish when you connect with the community to gather feedback and identify problems early on.

So if you have an idea, who should you talk to? What do you need to succeed? And where can you find funding to kick-start your idea? Fortunately, many resources are available right here on campus to help you out.



What Do I Need?

What do you need to turn your idea into reality? The two main things that help entrepreneurs kick-start their ideas are **funding** and **space**.

FUNDING

There are a number of avenues where you can find funding. There are two types of funding to keep in mind:

1. **Non-dilutive** funding typically does not involve giving up shares or ownership of the company. This category includes government grants, tax credits and prizes from events such as pitch competitions. Many organizations offer programs and grants for researchers and early-stage startups. These programs change frequently, so stay up to date on the ones that could be relevant to you.
2. **Dilutive** funding includes investments from private capital, such as angel investors and venture capitalists. Companies will typically trade shares in the company for funding from private capital, effectively “diluting” their ownership. “Dilution” continues as new investors come in and the percentage of the company owned by earlier investors decreases. Dilutive funding is important once the company grows to the point that it can no longer be sustained by grants alone.

SPACE

Where will you work? You may need space where you can do research or business development.

If you need office space or a desk, consider renting from a local coworking space. You can also look at groups on campus who might be able to offer coworking arrangements to new startups.

If your idea requires more specialized space, such as a lab or a kitchen, consider accelerator or incubator programs. These programs often provide specialized space, such as engineering fabrication space, kitchens, or lab space for biology or chemistry work.

WHERE WILL I FIND FUNDING?

Many grants and programs are managed by government organizations or other public sector agencies. Consider programs run by organizations such as:

- Alberta Innovates
- Canadian Institutes of Health Research (CIHR)
- Genome Alberta
- Government of Alberta
- Government of Canada
- National Research Council of Canada (NRC)
- Natural Sciences and Engineering Research Council of Canada (NSERC)
- Western Economic Diversification Canada (WD)

Not all programs and grants last forever, and not all of them are appropriate for every idea. We recommend you take a look at what you need and do some research on what programs these organizations might be able to offer you. We also recommend you start with some of the databases outlined in the Starting Points section later in this chapter.



Starting Points

Since every idea is different, not all resources will be useful for everybody. Your skills as a researcher will help you determine the resources that best suit your needs. Here are a few starting points for your research. Many of these resources are compiled into databases online, which can be filtered down and searched through depending on your needs. As you find and connect with more people in the ecosystem, you will learn more about other programs and services that can help you.

START ALBERTA

Start Alberta is an Alberta-focused online community of startups and startup-support organizations. These include service providers, investors, government agencies, and individuals in the community who can provide support and mentorship for your idea. Companies can add their own profiles to Start Alberta's ever-growing database.

Learn more: <https://startalberta.com/>

INNOVATION CANADA

Innovation Canada is an initiative from Innovation, Science and Economic Development Canada (ISED). This database is a collection of grants, programs, and support organizations that help entrepreneurs and innovators. Users can answer a short questionnaire that will help filter down the pool of programs to those that are most relevant to them.

Learn more: <http://innovation.canada.ca/>

ALBERTA INNOVATES TECHNOLOGY DEVELOPMENT ADVISORS

Alberta Innovates is a public agency that provides services to entrepreneurs, researchers, investors, and small-to-medium enterprises (SMEs). Its Technology Development Advisor (TDA) program provides business development and coaching to SMEs in knowledge-based industries. TDAs are well connected to Alberta's innovation ecosystem and can offer pointers and introductions for companies.

Contact intake@albertainnovates.ca to connect with a TDA in your area.

CONNECTICA

Connectica is a free service that connects users with Alberta's ever-expanding research and innovation network. Connectica facilitates introductions between stakeholders, researchers, and entrepreneurs, and helps to bridge the gap between Alberta's research organizations, universities, and publicly funded innovation-support services.

If you're an innovator looking to create a prototype, you need professional expertise to help test your product or require financing but don't know where to go, Connectica has helpful information. Its searchable database makes connections quick and easy, with several search options and intelligent filters that help you narrow your search.

Learn more: <https://connectica.ca>

BUSINESS LINK ALBERTA

Business Link is Alberta's entrepreneurial hub, helping people navigate the steps towards starting their own businesses. They provide one-on-one support and guidance, market research, access to experts, training, networking opportunities, and specialized support for Indigenous entrepreneurs.

Business Link's services are completely free of charge for entrepreneurs of all stages. Whether you are just thinking of an idea or you are looking to take your business to the next level, Business Link can help you.

Learn more: <https://businesslink.ca/>



On Campus

You don't have to look far to find resources. Mentorship services, accelerators, and even co-working spaces are available right on campus. Here are just a few examples:

Technology Transfer Services (TTS)

Transforming discoveries and innovations into reality is a complex and lengthy process. UAlberta's Technology Transfer Services (TTS) team helps facilitate this journey. Part of the Vice-President (Research and Innovation) portfolio, TTS helps researchers, postdoctoral fellows, staff and students transform innovations and discoveries into reality—moving them out of the university to benefit society, the economy, the world. We work with you to understand your research, idea and or innovation, and your goals and priorities. We can help you:

- Protect your innovation or idea: Working with you and our network of legal professionals we will help determine the best strategy to protect your intellectual property.
- Facilitate further development or navigate the commercialization processes.
- Assess commercial opportunity: Market potential, size and barriers, technology readiness level, commercial pathways etc.
- Negotiate license agreements and/or contracts: We draft and negotiate the business agreements needed to establish commercial partnerships.

Learn more: <https://www.ualberta.ca/research/innovation/tech-transfer/index.html>

BUSINESS DEVELOPMENT SUPPORT

The Post Secondary Institution Partners, with support from the Edmonton Regional Innovation Network, are offering free start-up development services to aspiring entrepreneurs. The BDS program will match you with subject matter experts who will help move your innovation-based project or start-up closer to market. Experts will work with you individually to help address your unique challenges and gaps, and will assist you in performing tasks that move you closer to company creation or market.

Learn more: <https://www.edmontonrin.ca/post-secondary-institutions>

EHUB

eHUB is the U of A's entrepreneurship centre, at 9007 HUB Mall. Offering resources, networking opportunities, and funding, eHUB gives members the unique opportunity to explore ideas that will transform into projects, initiatives, and ventures. Joining eHUB gives students access to the U of A's vibrant entrepreneurial community. The eHUB space is ideal for prospective entrepreneurs to work, collaborate, and connect with others.

Learn more: <https://www.ehub.ualberta.ca/>

THE ELKO ENGINEERING GARAGE

The Elko Engineering Garage is located on Level 2 of the Engineering Teaching and Learning Centre (ETLC). It serves as a makerspace and machine shop for students interested in pursuing projects outside their regular studies. Separated into "clean" and "dirty" work zones, the Garage gives students access to a large suite of tools for wood, metal, plastic, electronics, and 3-D printing work. Offering hands-on training and peer mentorship, the Garage is an ideal space for students interested in doing prototyping for their side projects.

Learn more: <https://garage.ualberta.ca/>

imYEG

Innovation Masterminds Edmonton (imYEG) is an industry-led pre-accelerator program designed to increase the quality and viability of commercial ventures leaving the University of Alberta and entering Alberta's business and innovation ecosystem. imYEG's team of industry leaders and investors help to overcome barriers that face researchers and students in the early stages of their commercialization journey. Co-created by the university and Brass Dome Ventures Inc., the program is designed to scale to other postsecondary institutions across Edmonton.

Contact: <https://www.imyeg.com>

Mitacs Accelerate Entrepreneur

Mitacs Accelerate Entrepreneur funds graduate students and postdoctoral fellows to further develop the research or technology at the core of their start-up business with the support of an approved incubator. Through funded internships, students build their professional entrepreneurial skills while learning how to commercialize their start-up's technology, product, or service.

Learn more: <https://www.mitacs.ca/en/programs/accelerate-entrepreneur>



THE POD

Located on the sixth floor of the Electrical and Computer Engineering Research Facility (ECERF), the Pod is a maker community for students. Students who join the Pod are given access to lab and prototyping space, mentorship, support, workshops, and events. The space contains a variety of machining and electronics development tools for prototype development. In the Pod, graduate students can gain mentorship experience by helping other students work on their projects. As part of this peer-to-peer network, graduate students can share insights and experiences that support up-and-coming innovators in the university community. Access to the space is limited and projects must be approved through an online application process.

Contact: info@pod-innovation.ca

THE SHACK (SCIENCE HARDWARE MAKERSPACE)

A student-driven group located in the Centennial Centre for Interdisciplinary Science (CCIS), the Shack offers 3-D printing and computer numerical controlled (CNC) milling equipment access. The Shack also hosts public outreach events, including summer camps for junior high and high school students. Students and postdocs can book the equipment online.

Contact: theshack@ualberta.ca

THE STUDENT INNOVATION CENTRE (SIC)

The Student Innovation Centre (SIC) is located in the Centennial Centre for Interdisciplinary Science (CCIS), between the Biological Sciences Building and the CCIS North Lecture Theatres. The SIC is a 5,000-plus-square-foot space for extracurricular science and technology-based competitions, maker projects and student-led ventures. The SIC is designed to empower students and postdocs to think creatively outside the classroom, providing support from early ideation through entrepreneurship. The space's resources include bookable project rooms, conferencing capabilities, and equipment such as 3-D printers, microscopes, and high-spec computers for machine learning, virtual reality (VR), augmented reality (AR), and graphics processing.

Contact: student.innovation@ualberta.ca

SOCIAL INNOVATION INSTITUTE

Social innovation involves strengthening the greater community, sustainability, and social good, usually focusing on education, community development, health, or underprivileged individuals. The Social Innovation Institute at MacEwan University connects people with mentors and experts who can help support students' commitment to social change. The institute is open to anybody with a socially conscious idea. Location: Roundhouse, Allard Hall, MacEwan University

Learn more: <https://www.macewan.ca/wcm/SocialInnovationInstitute/>

nanoFAB

A national training, service, and fabrication centre, targeted to academic and industrial micro- and nanoscale applications.

Learn more: <https://www.nanofab.ualberta.ca/>

UNIVERSITY OF ALBERTA HEALTH INNOVATION HUB

Operated by the Faculty of Medicine & Dentistry, the Health Innovation Hub delivers mentoring, programming and access to laboratory and office space at Enterprise Square. The facility supports and inspires health-science innovators with a trainee stream that provides professional development, business, and entrepreneurship training to graduate and post-graduate students.

Learn more: <https://www.ualberta.ca/medicine/research/health-innovation-hub/index.html>

UNIVERSITY OF ALBERTA LIBRARY

Provides resources on innovation and idea generation, market research, business plans, financing and more. Offers low-barrier access to 3D printing technology through a mediated service (ie. we print your models for you). This is open to all students, faculty, and staff for any creative or educational purpose.

Learn more: <https://guides.library.ualberta.ca/c.php?g=721874>

Learn more: <https://www.library.ualberta.ca/services/3dprinting>

UALBERTA VENTURE MENTORING SERVICE (VMS)

Modelled after a program at the Massachusetts Institute of Technology (MIT), the U of A's Venture Mentoring Service (UAlberta VMS) develops, inspires and empowers alumni entrepreneurs by engaging them with teams of experienced mentors. This mentorship program is meant to support entrepreneurs who are running scalable ventures that are growing. VMS places entrepreneurs with a team of three to five volunteer mentors from the business community, who provide ongoing guidance through structured meetings. There is no term limit and ventures are welcome to stay in the program as long as they are operating and getting value from their mentors. There are usually two to three intake periods each year and applications are accepted on a rolling basis.

Learn more at: <https://www.ualberta.ca/VMS/>

CAMPUS INNOVATOR: SCIENCE TO BUSINESS NETWORK (S2BN)

What options are available for graduate students who don't want to pursue academia? This is what the Edmonton chapter of the Science to Business Network (S2BN) hopes to address. S2BN is a peer-to-peer network that connects students to industries with events and workshops that show students opportunities beyond the lab. Quinn Storozynsky, a PhD candidate in oncology at the Faculty of Medicine & Dentistry, is part of the executive team at the S2BN. Quinn is particularly interested in exploring options beyond traditional academia and wants to help his peers develop the soft skills to succeed in whatever career they choose.



Other Resources for Entrepreneurs

It's hard to be an innovator alone, so reach out to the community for help! There is a vibrant entrepreneurial support network beyond the university that can help you take your idea to the next level.

Here is a list of resource types and some examples. There are also some suggestions about when to reach out to the organizations listed. These are not rules; they are general guidelines only. Because many organizations support innovators at all stages, it's a good idea to familiarize yourself with those that may help you now as well as in the future.



INNOVATOR SPOTLIGHT: Aryan Azmi - Public Health

Aryan has been involved with several projects during his Masters including: 1) a project proposed by the Cancer Strategic Clinical Network that identifies gaps in cancer care for under-served and vulnerable populations in Alberta.; 2) a project to reduce wait-times for rehabilitation services in rural communities and 3) a project to create temporary housing for homeless people to improve their well-being.

See <https://www.ualberta.ca/youalberta/innovator-spotlight.html> for more featured students

FUNDING OPPORTUNITIES

Resource Type	Stage	Description	Example Organizations
Public Research Grant Organizations	Early	Government departments and public sector organizations offer various research grants for scientists and students. Grants are sometimes tied to a specific industry.	<ul style="list-style-type: none"> Alberta Innovates (Program Managers) Canadian Institutes of Health Research (CIHR) Genome Alberta Government of Alberta Government of Canada Natural Sciences and Engineering Research Council (NSERC) Western Economic Diversification Canada (WD)
Private Research Partnership Grants	Early	Private industries can partner with funding agencies and researchers to support research in topics of interest.	<ul style="list-style-type: none"> Bayer Open Innovation Canada's Oil Sands Innovation Alliance (COSIA)
Foundations and Charities	Early	Charities and non-profit organizations can provide research funding to support specific causes, such as disease research or social innovation.	<ul style="list-style-type: none"> Alberta Cancer Foundation Branch Out Neurological Foundation Heart and Stroke Foundation of Canada Kidney Foundation of Canada University Hospital Foundation

Resource Type	Stage	Description	Example Organizations
Public Sector Grants	Early/Mid	Grants and programs are available specifically for incorporated small businesses looking to commercialize their products in early research and development (R&D). Some programs also help recruit new employees as part of a subsidized wage program.	<ul style="list-style-type: none"> Alberta Innovates Agriculture and Agri-Food Canada (AAFC) BioTalent Canada Innovation, Science, and Economic Development Canada (ISED) Mitacs National Research Council Industrial Research Assistance Program (NRC-IRAP) Sustainable Development Technology Canada (SDTC) TECTERRA
Angel Investment Networks	Early/Mid	Angel investors are usually independent wealthy individuals who make investments into companies. They usually have some experience working in a specific industry and may be part of a larger angel network.	<ul style="list-style-type: none"> Accelerate Funds I and II Brass Dome Ventures Ltd. Valhalla Angels
Small-Business Loans	Early/Mid	Some organizations offer small-business loans geared specifically to tech entrepreneurs and their unique challenges.	<ul style="list-style-type: none"> Business Development Bank of Canada (BDC) Futurpreneur Canada RBC Generator



Resource Type	Stage	Description	Example Organizations
Private Partnerships	Mid/Late	Private corporations may partner with small companies to help the commercialization and growth of new technology. This may involve licensing or selling the technology.	<ul style="list-style-type: none"> • Pharmaceutical multinationals • Medical device multinationals • Software multinationals • Other startups
Venture Capital	Mid/Late	Venture capitalists (VCs) invest funds, mentorship, and industry support to help accelerate the growth of companies. VCs search for companies that match their portfolio and are not necessarily restricted to geographic locations. Though VCs typically invest in late-stage companies, many are investing in seed rounds early in the life cycle of a company.	<ul style="list-style-type: none"> • 32 Degrees Capital • Accelerate Funds I and II • adMare Bioinnovations • Alberta Enterprise Corporation (invests in other funds) • Avrio Capital • Builders VC • Discovery Lab • MaRS Ventures • McRock Capital • Panache Ventures • Yaletown
Commercial Bank Loans	Late	Banks and credit unions can offer larger loans for scaling up a business. These plans may charge interest on repayment. Some banks have specialized programs for high-tech or knowledge-based industries.	<ul style="list-style-type: none"> • Alberta Treasury Branches (ATB Financial) • Business Development Bank of Canada (BDC) • Major banks and credit unions



NETWORKING OPPORTUNITIES

Resource Type	Stage	Description	Example Organizations
Research Networks and Centres of Excellence	Early/Mid	Researchers collaborate in pan-provincial or pan-Canadian networks in specific fields. Alberta also has centres of excellence in specific disciplines.	<ul style="list-style-type: none"> • Alberta Machine Intelligence Institute (Amii) • Campus Alberta Neuroscience (CAN) • GlycoNet • National Research Council (NRC) Nanotechnology Research Centre
Community Organizations	All	Non-profit organizations offer a wide variety of services and community networks. Reaching out to the local community helps connect you to other entrepreneurs and innovators. These organizations may also run educational workshops and events.	<ul style="list-style-type: none"> • The A100 • The C100 • Edmonton Health City • eHUB • Hunter Hub for Entrepreneurial Thinking • Rainforest Alberta • Startup Edmonton
Recurring Events	All	Some events happen weekly or monthly, offering education and frequent networking with the local community.	<ul style="list-style-type: none"> • AccelerateAB • ATB Entrepreneur Centre • Banff Venture Forum • INVENTURE\$ • Lunchalytics • PROPEL Energy Tech Forum • Rainforest Alberta

Resource Type	Stage	Description	Example Organizations
Social Media Networks	All	Social media and websites offer places to learn about events in your community. Following organizations that are helpful to you will keep you in touch with current events.	<ul style="list-style-type: none"> Eventbrite LinkedIn Meetup Twitter
Industry Associations	All	Industry associations are usually member-driven organizations with shared interests. They champion and advocate for the interests of industry to all levels of government. Many industries are represented by an industry association.	<ul style="list-style-type: none"> Alberta Clean Technology Industry Alliance (ACTia) Alberta Machine Intelligence Institute (Amii) BioAlberta Canadian Entrepreneurs in Life Science (CELS) Canadian Entrepreneurs in New England (CENE) Northern Alberta Clinical Trials + Research Centre (NATRC) Venture Capital Association of Alberta (VCAA)



CAMPUS INNOVATOR: LEVEL UP HACKATHON

Calvin Eng is currently working towards his MSc in computing science and is also a teaching assistant for a software process and product development course. In January 2019, he and three co-organizers ran the first Level Up Hackathon under the Faculty of Science, in co-operation with the Student Innovation Centre. More than 80 students collaborated over a weekend to build web applications for cultural analytics. Calvin’s involvement stemmed from an interest in giving other students the opportunity to gain hands-on learning experience through workshops and apply their skills to real-world applications. He hopes that the Level Up Hackathon will grow to two hackathons per year as a Faculty of Science initiative.

SUPPORT PROGRAMS AND SERVICES

Resource Type	Stage	Description	Example Organizations
Research/ Business Pitch Competitions	Early	Many organizations host research challenges, pitch competitions, or hackathons. These allow innovators to experiment, prototype, and share their ideas with the community. Some competitions may provide financial prizes to winners.	<ul style="list-style-type: none"> NeuroNexus Falling Walls Hacked Level Up Hackathon Microsoft Imagine Cup Map the System Spur the Change World's Challenge Challenge Sheridan Challenge Telus Innovation Challenge
Incubators/ Co-Working Spaces	Early/Mid	These organizations offer equipment, rental space, and mentoring to help early-stage innovators create proofs of concept. Incubator environments allow inventors to experiment and test their product ideas. These include makerspaces and coworking spaces.	<ul style="list-style-type: none"> Elko Engineering Garage Edmonton Public Library Makerspace imYEG Northern Alberta Business Incubator (NABI) Student Innovation Centre The Pod University of Alberta Health Innovation Hub
Industry-Specific Incubators	Early/Mid	Some incubators and coworking spaces are more tailored to established companies. They may provide access to specialized equipment for specific industries.	<ul style="list-style-type: none"> Centre for Drug Research and Development (CDRD) Startup Edmonton ST Innovations Ward of the 21st Century (W21C)

Resource Type	Stage	Description	Example Organizations
Accelerators	Early/Mid	These short-term programs connect companies to mentorship and resources to help them grow faster. Accelerator programs may provide space for their participants, but usually not permanently. These programs usually have a competitive intake process for their cohorts.	<ul style="list-style-type: none"> Canadian Technology Accelerator Creative Destruction Lab (CDL) – Rockies District Ventures and IBM Innovation Space DynaLIFE Accelerator Merck Invention Accelerator Mitacs Accelerate Entrepreneur program RBC Social Enterprise Accelerator
Trade and Export Programs	All	Trade and export programs help companies navigate new markets. Some may offer funding or other support for trade missions.	<ul style="list-style-type: none"> Alberta Economic Development and Trade Canadian Trade Commissioner Service Edmonton Economic Development Corporation (EEDC) Export Development Canada (EDC) Global Affairs Canada Western Economic Diversification Canada
Support Services	All	These organizations offer specific services that may be beneficial to product development or company growth. They may charge fees for their services.	<ul style="list-style-type: none"> 321 Growth Academy ACAMP Business Link InnoTech Alberta Technology Transfer Services UofA University of Alberta Venture Mentoring Service (UAlberta VMS) Venture Mentoring Service of Alberta (VMSA)



What's Next?

With new knowledge of the university's IP policy and ideas about who to reach out to in the community, you might be ready to take your new idea to the next level.

But where to start? What do you need to ask? What else should you keep in mind on your innovation journey? To help you, there are a few tips you might want to consider along the way.





What Should I Be Asking?

As an innovator who is just starting out, sometimes you don't know what you don't know. That's perfectly normal! This section should get you thinking about some questions to consider as you embark on your innovation journey.

Keep in mind that although many of these questions are common for most innovators and aspiring entrepreneurs, not all of them may apply to your particular idea. Similarly, these lists are not exhaustive in their scope. The mentors and networks you foster will be able to guide you with more questions specific to your idea.

IF YOU'RE WORKING ON AN IDEA...

- **Have you talked to your supervisor?** Your supervisor might have suggestions about how to move forward.
- **Have you researched the industry?** It's important to learn about not only the field you're working in, but also the industry your target market is in. Minimize assumptions about your target industry by researching as much as you can.
- **Have you researched other industries?** Consider if there are ways that your idea can be used in other industries or to solve other problems. Be creative! Perhaps if you make a few tweaks your idea could be applied elsewhere.
- **Are you targeting a real problem?** Many times, inventors create solutions to a problem that doesn't exist. Compare your idea to existing solutions and find out what makes yours better. Ask potential customers how much the problem you identified matters to them. This will help narrow down your *unique value proposition*: the thing that sets your idea apart from others.

- **Are existing solutions good enough?** Sometimes a solution already exists that doesn't need improvement. If you are not addressing the real pain points of your target audience, they might not be able to justify adopting your solution.
- **Have you talked to potential customers?** One way to understand your target market is to interview people who work in it. Talking to professors is a good start, but you can also reach out to industry networks, associations, and even friends and family members who work in your target industry every day. They might be able to identify problems that you haven't considered.
- **Have you gathered feedback?** Customer interviews aren't the only way to gather feedback about your idea. Consider attending pitch competitions, Meetups, and local networking events to share your idea with as many people as possible.
- **Have you iterated on the design based on feedback?** As an innovator, it's crucial to be able to change your idea based on feedback from your potential customers. Use the feedback you gather from your research to refine your idea, then gather more feedback until you find a real pain point to address.
- **Who do you need on your team?** Find people who complement your skills and personality. Having people from different backgrounds and skill sets will help you better identify potential pitfalls early on.
- **Have you created other problems?** If you create more problems than you solve, it is unlikely that your customer will buy into the idea. Consider the trade-offs your end user might have to make to adopt your idea.
- **Have you thought of a business model?** Tools such as the Lean Canvas or Business Model Canvas can help you structure your idea and address critical questions. Using a canvas is highly recommended to help you consider who your target customer is, how you plan to generate revenue and how you plan to meet customer needs. You can make your own canvases using free online tools such as Canvanizer. Workshops are also available in the community to guide you through the process.

IF YOU'RE CONSIDERING A PATENT...

- **Is your idea patentable?** To get a patent, your idea must be new, useful, and non-obvious. A quick search online will show you if an idea like yours already exists.
- **Who owns the intellectual property?** Intellectual property generally remains with the inventor(s), regardless of their status as students. If you are an employee (such as a research assistant or lab technician), consult your employment contract to see if you retain the IP created during the course of your duties with the university.
- **Do you have obligations to the university or grants?** Some grants and programs have stipulations that may affect your IP or your funding. TTS may be able to help you identify any potential encumbrances to your idea before you start.
- **Have you published the invention?** If you're looking to patent, it is best to file a patent prior to publishing your findings in a thesis, paper, or presentation. If you have already published, speak with TTS as soon as possible to find out if you can still file a patent in time.
- **Do you want to license the invention or create a spinoff company?** Consider the pros and cons of each option to decide your best path forward.
- **Are you assigning the IP to yourself or the university?** If you wish to assign the IP to yourself, consider how much time and effort you can commit to the commercialization process.
- **Have you filed a Report of Invention?** As per the Patent Policy, all inventions must be disclosed to the university. The Report of Invention (ROI) outlines how you wish to continue with commercialization.
- **Have you filed a patent?** If the IP is assigned to the university, the university will handle the initial patent filing fee.

IF YOU'RE PLANNING TO START A COMPANY...

- **How much are you willing to commit?** Entrepreneurship isn't easy—you will need to invest energy, time, and money to grow the company. This shows commitment to your vision and idea. After all, if you don't take a risk on your new venture, why should other investors?
- **Who are your co-founders?** Your company's chance of success is substantially higher if you have a co-founding team that complements each other's skill sets. Consider having a mix of technical and business talent on your co-founding team.
- **Who are your mentors?** Mentors are entrepreneurs, colleagues, professors, and friends who are willing to provide advice, support the growth of your idea, and teach you important skills.
- **Do you have legal counsel?** As you scale up your company a lawyer will be helpful, making sure your corporate legal structure is done correctly. Check whether local law clinics offer free services for students interested in incorporating.
- **Will there be regulatory considerations?** Some industries, such as health, agriculture, and environmental sciences, have specific regulatory requirements to keep in mind as you commercialize your technology.
- **What is your share structure?** Who owns how much of the company? Remember that some of your company's equity is shared with the university. Consider whether or not employees will be given stock options as part of their compensation package.
- **Have you incorporated?** According to the Patent Policy, if you assign the IP to yourself, you need to file the paperwork for incorporation of the company. If the IP is assigned to the university, TTS can take care of that for you.
- **Are there programs and grants that can help you?** Many programs and community organizations help new entrepreneurs. Reach out to your network and check whether campus resources can connect you to the right people.
- **What is your revenue model?** Even if your idea is not for profit, you need to make money to sustain operations. Find out whether your target customer is willing to pay to use your solution. If not, who can you target instead and what value can you bring?
- **Have you validated these ideas?** One of the biggest pitfalls for a new company is making assumptions about their audience. The best way to reduce that risk is to stay connected with your potential customers and use their feedback to iterate on your idea.

IF YOU ALREADY HAVE A COMPANY...

- **What other sources of funding are available?** Many startup companies start with grants and vouchers, but those will not meet your needs for long. Look to loans, friends-and-family financing, and even business-plan competitions for funding help.
- **Have you talked to angel investors?** Angel investors are wealthy individuals who may invest money in exchange for shares of the company.
- **Who is on your board of directors?** The board of directors holds the CEO accountable for their actions. They should represent a diverse set of skills and backgrounds to ensure the best possible decisions are made. Sometimes, investors will gain a board seat as part of their investment.
- **Who will lead the company?** Co-founders are not always executives in a company. In fact, it is very rare for the technical co-founder to be the CEO of a technology company. Many companies will hire a CEO with the expertise and business acumen to help the company grow faster.
- **What is your exit strategy?** An *exit strategy* is an entrepreneur's plan for selling ownership of the company to another party. The sale of a successful company can result in profits for an entrepreneur. It's important to keep this in mind when building your company.
- **Do you have a growth and marketing strategy?** Consider not only what the strategy may be, but also the timeline for implementation.
- **Do you have a budget?** Figure out how much *runway* you have (how long your company can sustain its current operations with the finances you have) and whether or not you need to either find new sources of funding or cut back on expenses.





A wide-angle photograph of the University of Alberta campus. The sky is bright blue with scattered white clouds. In the foreground, a large green lawn is visible, with several people walking and some picnic tables. In the background, there are several modern university buildings, including a prominent red brick building and a white building with a dark roof. The overall scene is bright and sunny.

Where Will Your Path Take You?

The University of Alberta is a world-class research institution, and your innovations deserve to be shared with the world!

What you have learned from this handbook is just the start. There is a diverse and supportive community both on and off the campus, waiting to help you take your idea to the next level.

You'll never know where your innovation journey will take you unless you try. So dream big, stay curious, and reach out!

