SAN DIEGO STATE UNIVERSITY

FOUNDERS MANUAL

A GUIDE TO RESOURCES FOR ENTREPRENEURSHIP & THE COMMERCIALIZATION OF IDEAS

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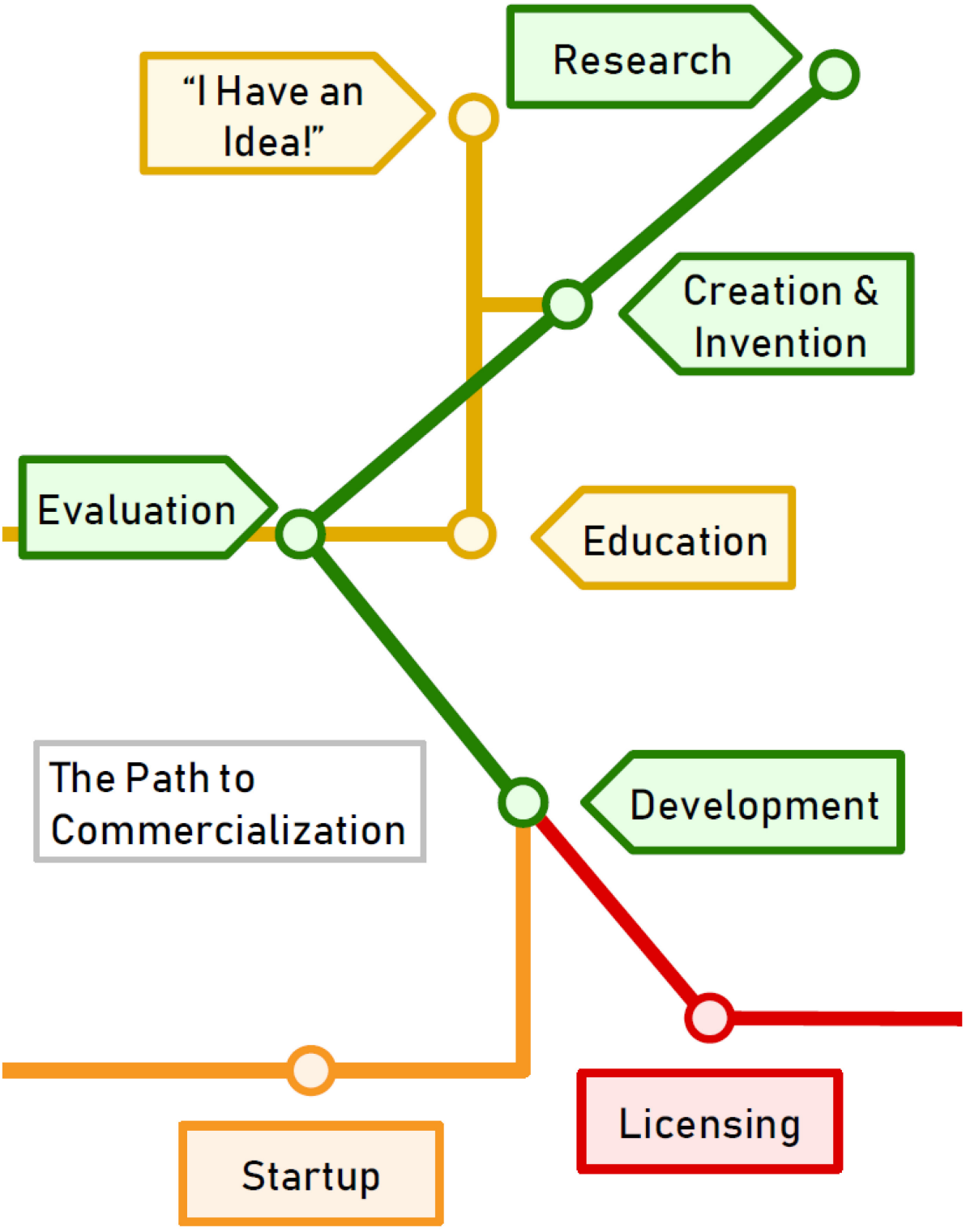
The Path to Commercialization



"I Have an Idea!"

San Diego State University

Founded in 1897, San Diego State University (SDSU) is a public university and campus in the California State University (CSU) system. Originally a training facility for elementary school teachers, SDSU has become a leading public research university serving a diverse student body of over 30,000 undergraduate, graduate, and doctoral students.

In addition to providing a high-quality education, SDSU as part of its mission "to contribute to the solution of problems through … the arts and technology," SDSU supports the ideas of students and faculty with a full array of resources for entrepreneurship and commercialization. This manual is an introduction to many of those resources.

About This Manual

How do I use the SDSU Founders Manual*? Who is this guide for?*

World-changing ideas can come from people of all disciplines, education levels, and backgrounds; but turning an idea into a reality can be a challenging, daunting, and scary process!

The *SDSU Founders Manual: A Guide to Resources for the Entrepreneurship & Commercialization of Ideas* was created by the SDSU Entrepreneurial Experiences Working Group (EEWG) to serve as a starting point and roadmap for anyone in the SDSU community turning their idea into a reality. It is intended to be a resource for students, faculty, staff, and other creators by:

- Introducing founders to important concepts for commercializing ideas or sharing them with the world.
- Directing founders to resources, organizations, and people in the SDSU Entrepreneurial Ecosystem that can help make an idea a reality.

While "founders" are often associated with establishing a company, a founder in the context of this manual, is someone with an idea that he or she wants to share with the world, commercially or otherwise. A founder can be an author, inventor, artist, entrepreneur, innovator, or other creator. *Anyone* can be a founder—all that person needs is an idea and the desire to do something with it.

There are many entry points and exit points for you, the founder, and your idea, and there is no *one* path for an idea to follow.

The Path to Commercialization visible in the map just before this chapter, is not a direct, linear path, but an iterative route that can be traveled from start to finish, back again, and everywhere in between.

This manual exists to help authors, inventors, artists, entrepreneurs, innovators, and creators find where they can go for help in the SDSU Entrepreneurial Ecosystem—regardless of whether they are working toward commercialization or where they are in the Path to Commercialization.

This chapter (*"I Have an Idea!"*) introduces three key components of the SDSU Entrepreneurial Ecosystem, and then directs founders to the first stop in the *Path to Commercialization* based on their idea's needs.

The SDSU Entrepreneurial Ecosystem

The SDSU Entrepreneurial Ecosystem is the collection of people, resources, and institutions

connected with San Diego State University that exist to help founders share their idea with the world.

There are many parts of the SDSU Entrepreneurial Ecosystem, but three of the most prominent components are the *Zahn Innovation Platform (ZIP) Launchpad,* the *Lavin Entrepreneurship Center,* and the Technology Transfer Office (TTO).

Ideas often come from the research process: the systematic inquiry of scientific ideas. Research leads to new, novel, and non-obvious inventions and creative works that are protectable by intellectual property. Go to the *Research* chapter to learn more about that process of discovering ideas.

The ZIP Launchpad

The Zahn Innovation Platform (ZIP) Launchpad is SDSU's on-campus incubator with programming designed to help build a company from an early stage idea. Although the ZIP Launchpad primarily services undergraduate students, it is open to staff and faculty as well.

Learn more about the ZIP Launchpad's programming in the sections *ZIP Launchpad E-Track* and *ZIP Launchpad Launch Tracks.* Read more about *Incubators & Accelerators* generally in *Forming a Startup.*

For ideas unrelated to research, the ZIP Launchpad is a great place to start. The ZIP Launchpad helps SDSU students, faculty, and staff launch a startup from their early stage idea. ZIP intends to provide a transformational experience to complement the education, resources, and services SDSU offers to students, faculty, and staff.

- Learn more about the ZIP Launchpad at http://ziplaunchpad.sdsu.edu/

Applications to participate in the ZIP Launchpad's program are open every semester. Through their programming, guidance, support and resources , the ZIP Launchpad helps develop and nurture your idea, and (eventually) launch your idea as a scalable venture.

Apply for the ZIP Launchpad at https://www.f6s.com/ziplaunchpad/apply

The ZIP Launchpad has a track record of success, having accomplished the following as of 2019.

- Assisted more than 200 teams and more than 400 students
- Launched 26 teams successfully
- Developed companies that have raised over $11 million in funding

The ZIP Launchpad hosts events throughout every semester to inform aspiring entrepreneurs about their services and active teams. See the ZIP Launchpad's event calendar at http://ziplaunchpad.sdsu.edu/live-cal.

The ZIP Launchpad is located in the William E. Leonhard Entrepreneurship Center on the first floor of SDSU's Engineering and Interdisciplinary Sciences (EIS) building.

The ZIP Idea Lab

Conceived with a mission "to generate ideas that solve problems," the ZIP Idea Lab is uses design thinking and creative tools to arouse those innovative solutions. Currently on hiatus, the ZIP Idea Lab is set to relaunch in late 2019 or early 2020. Contact the ZIP Launchpad to ask about the status of the ZIP Idea Lab and how it could help you.

The Idea Lab serves the SDSU students, faculty, and staff, as well as individuals and companies throughout the region who need help developing products, services, and improved processes.

- About the Idea Lab: https://idealab.sdsu.edu/about/
- Services offered by the Idea Lab: https://idealab.sdsu.edu/services/

The Lavin Entrepreneurship Center

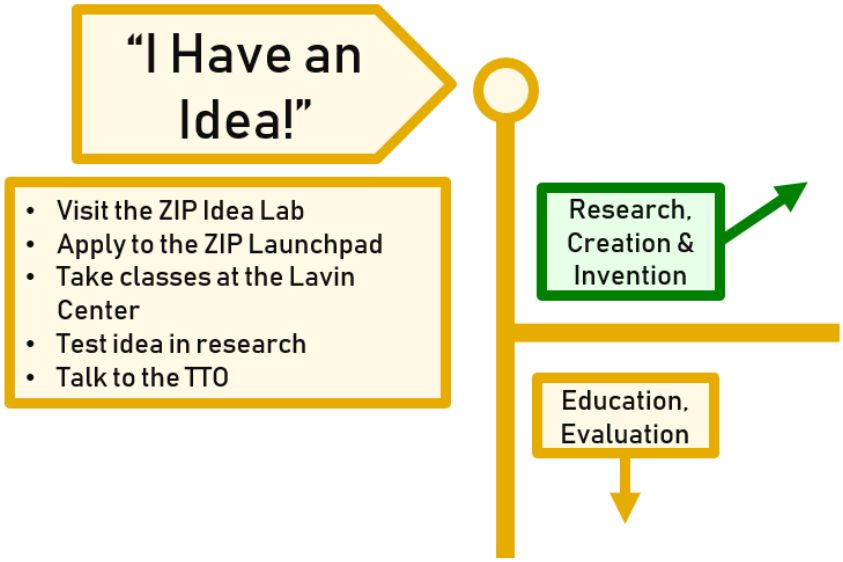
The Lavin Entrepreneurship Center is SDSU's primary source of entrepreneurship education through its courses offered to students. See the chapter on *Education About Entrepreneurship & Innovation* for more information on the opportunities provided by the Lavin Entrepreneurship Center and the Fowler College of Business.

The TTO

The SDSU Technology Transfer Office (TTO) commercializes intellectual property produced on campus through research. Although the TTO primarily serves the faculty and the ideas related to their research, the TTO acts as a valuable resource for innovation and entrepreneurship for the entire SDSU Entrepreneurial Ecosystem.

Don't be misled by the word "technology" though, as the TTO's activities are not limited to technological ideas; it supports creative endeavors as well. Learn more about the TTO in the *Creation & Invention* chapter.

Where to start with *the* idea?



I have an idea! What should I do?

Often, a big idea comes before any formal research or creation of intellectual property takes place. A common problem may inspire a unique solution, or an innovative idea may solve an unaddressed problem—ideas can spark from anywhere.

The exciting thing is that you have several options about how to proceed with your idea, regardless of how fully formed it is.

If you have an idea about a problem, but don't know how to solve it, consider brainstorming a solution or visiting the *ZIP Idea Lab* for help finding a solution.

If you're an SDSU student, staff, or faculty member with an innovative idea but don't what to do with it, consider discussing the idea with the *ZIP Launchpad* to learn if it's appropriate for its *E-Track* or *Launch Tracks.*

If you're an SDSU student and want to learn more about entrepreneurship or how to share your idea, consider enrolling in classes in the *Fowler College of Business* or seeking opportunities through the *Lavin Entrepreneurship Center.*

If you don't have an idea yet but want to learn more about entrepreneurship, innovation, and intellectual property in general, proceed to the chapter on *Education About Entrepreneurship & Innovation.*

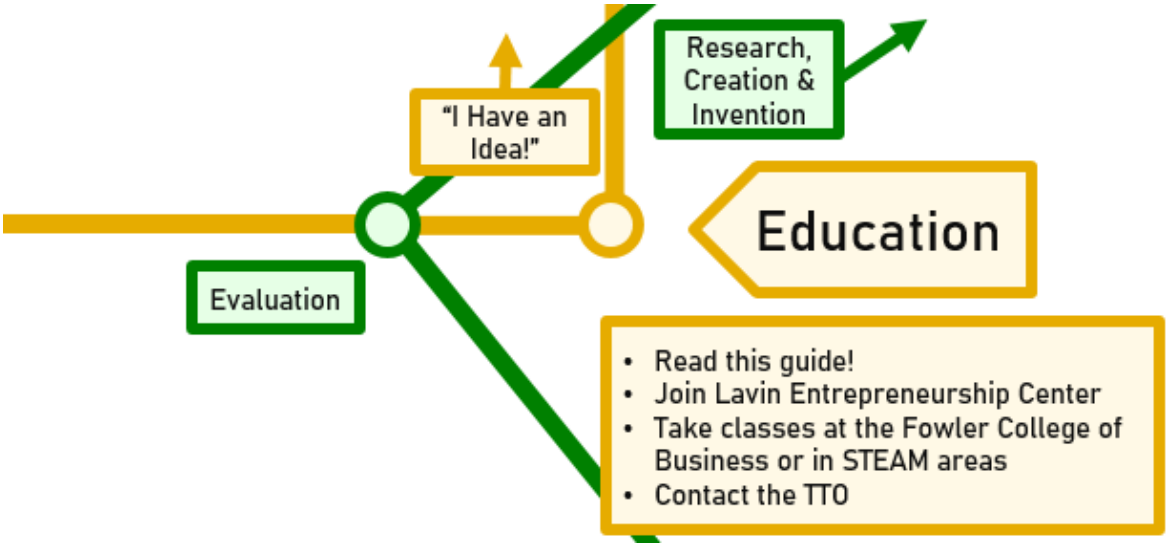
If you're still in the process of performing research, looking for research funding, or looking for the technical solution to your problem, but have yet to create or invent anything, visit the chapter on *Research.*

If you think you're idea may be a patentable invention or copyrightable creative work, or want to make a prototype of your idea, consider contacting the *TTO* or go to the chapter on *Creation & Invention.*

If you want to learn whether your idea can support a new company, proceed to *Evaluating the Idea.*

Education About Entrepreneurship & Innovation

Where to learn about the process?



SDSU and local entrepreneurial ecosystem has a variety of educational resources and programs that can help students, faculty, staff, and community members learn about entrepreneurship and innovation.

If you are a student who wants to learn about entrepreneurship and innovation in general, building a business, or how to turn your big idea into a reality, read about the *Lavin Entrepreneurship* and the other education opportunities in this chapter. Not a business major? Don't worry, there are lots of education opportunities for students of all backgrounds and disciplines.

If you are a faculty member who wants to learn more about entrepreneurship, innovation, and commercialization at SDSU, read about the *Technology Transfer Office* in this chapter.

If you're ready to proceed, go ahead to *Creation & Invention* or *Evaluating the Idea.*

The *SDSU Founders Manual*

There's good news: If you are interested in learning more about entrepreneurship and innovation, the *SDSU Founders Manual* is a good place to start. This guide is merely a starting point for your idea, but it was created as a resource to help you find your idea's next step.

The Lavin Entrepreneurship Center

The *Lavin Entrepreneurship Center* and the *Fowler College of Business* are SDSU's primary sources of education for students on entrepreneurship. The Fowler College of Business offers formal classes on entrepreneurship, management and business administration.

The Lavin Entrepreneurship Center offers entrepreneurial programs, hands-on experiences, curriculum to supplement the Fowler College of Business, opportunities for class credit,

educational conferences and workshops for educators, paid internship positions, and mentorship for aspiring entrepreneurs.

Do you want to learn more about entrepreneurship for when your world-changing idea strikes? Or do you already have a big idea but need to learn what it takes to be an entrepreneur? If yes to either, then enroll in classes at the Fowler College of Business or learn about the programs offered by the Lavin Entrepreneurship Center.

Entrepreneur magazine, the Princeton Review, and Forbes have all recognized SDSU as one of the best entrepreneurial programs in the U.S. "The Lavin Center has become a stellar example of what can result when academic talent, local industry, and private donors join forces, balancing the very latest in scholastic knowledge with experiential learning."

In addition to curriculum supplementing the *Fowler College of Business,* the Lavin Center's programs include:

- Founders and Students Connect at LaunchIn
- Entrepreneur Day
- MBA/MSBA Internships
- The Social Entrepreneurship Program
- Lavin Center Entrepreneurship Study Abroad Program

Learn more about the Lavin Center at http://lavincenter.sdsu.edu/about/.

Other Entrepreneurship & Innovation Education

Entrepreneurship Minor and MBA Specializing in Entrepreneurship

Beyond formal participation in the Lavin Center, the entrepreneurship minor at SDSU educates students on how to start and run a business. The entrepreneurship minor is available to all students at SDSU, even those that are not enrolled in the Fowler College of Business.

Five different tracks are offered by the entrepreneurship minor to students with varying interests: the traditional track; the social track; technology and science track; the arts and design track; and the international track.

- Entrepreneurship Minor at SDSU: https://business.sdsu.edu/management/entrepreneurship/minor
- Entrepreneurship Minor for Business Students: http://lavincenter.sdsu.edu/curriculum/businessMinor.php
- Entrepreneurship Minor for Non-Business Students: http://lavincenter.sdsu.edu/curriculum/non_business_minor.php
- MBA Program Specializing in Entrepreneurship: https://business.sdsu.edu/mba/entrepreneurship
- SDSU Music Entrepreneurship & Business Program: http://lavincenter.sdsu.edu/curriculum/MusicEntrepreneurship.php

STEAM Education at SDSU

A lot of entrepreneurship and innovation is either inspired or cultivated by education in the STEAM fields: Science, Technology, Engineering, Arts & Math. SDSU offers a variety of majors and courses in all these areas.

STEAM courses that can inspire an idea for a prospective founder are the variety of senior design courses across the campus. Senior design projects, such as those in the College of Engineering, provide students a hands-on opportunity to deploy the skills they learned throughout their coursework at SDSU. These courses give students a chance to develop a new idea, work on an industry-sponsored project to solve a problem, or pursue a creative idea of their own choosing.

For example, 3D printing company Robo3D, started by two SDSU students, was inspired by student entrepreneur Coby Kabili's "solution to complete his senior engineering course developing a 3D printed prosthetic leg." The idea led to Coby and his classmate and co-founder Braydon Moreno launching a Kickstarter

campaign that raised $649,000 (https://robo3d.com/pages/about-us).

The Engineering & Interdisciplinary Sciences (EIS) Complex opened in January 2018 and houses some of the most advanced research laboratories on campus. The EIS Complex is designed to foster collaborations and intellectual collisions between students and faculty of different backgrounds and specialties to generate the great idea. The complex houses the William E. Leonhard Entrepreneurship Center (home of the ZIP Launchpad), labs, and several designated collaborate spaces for students to use.

Other STEAM education resources at SDSU.

- Undergraduate Programs in the College of Engineering: https://www.engineering.sdsu.edu/academics/undergraduateprograms.aspx
- Departments, Programs & Centers in the College of Sciences: http://www.sci.sdsu.edu/cos/cosdepartments.php
- Prospective Students at the SDSU School of Art + Design: https://art.sdsu.edu/students/prospective-students/
- STEM careers and events from Career Services: https://go.sdsu.edu/student_affairs/career/stemcareersmonth.aspx

Other University Curriculum

SDSU offers many other courses at the University and in the SDSU College of Extended Studies (https://ces.sdsu.edu/) that can help those interested learn more about developing their ideas or entrepreneurship.

But entrepreneurship, innovation, and creativity aren't just traits learned in the classroom, but mindsets instilled throughout the SDSU community. That enterprising mindset is just one of the reasons SDSU is ranked in the top 50 of most innovative schools by *U.S. News.*

Learning about Entrepreneurship & Innovation at the TTO

While focused on commercializing ideas produced through faculty research, the *TTO* also serves as an indispensable educational resource for entrepreneurship, innovation, and intellectual property at SDSU.

The TTO frequently offers presentations on intellectual property and commercialization to colleges, departments, classes, and the community.

Contact the SDSU TTO or read more about the TTO in *Creation & Invention.*

- TTO website: http://research.sdsu.edu/tto
- Background on Intellectual Property: http://research.sdsu.edu/tto/background-ip-law
- The Path to Commercialization: http://research.sdsu.edu/tto/path-to-commercialization
- TTO Services Offered to Faculty: http://research.sdsu.edu/tto/tto-services

SDSU Entrepreneur Society

The SDSU Entrepreneur Society is an official student organization sponsored by the *Lavin Entrepreneurship Center.* The SDSU Entrepreneurship Society's mission is to help students approach life with passion, fascination by what they can accomplish, and desire to fulfill their potential. Membership in Entrepreneur Society provides numerous benefits such as dinner at meetings, access to legal services and mentors, cash rewards in pitch competitions, and chances to network with the society's keynote speakers.

- SDSU Entrepreneurship Society: https://entrepreneur.sdsu.edu

The SDSU Library

Not only is the SDSU library a great place to study, but the library has a variety of resources, tools, and databases to help students, faculty, and the community to learn about entrepreneurship and innovation, including the scientific, creative, and business aspects about bringing your idea to fruition.

Questions the library might help you answer include:

- Does the library have any software to work on my idea such as Adobe Photoshop, Microsoft Office, and iMovie? https://library.sdsu.edu/computers-technology#computer-software
- What companies are already in the market of my idea? http://libguides.sdsu.edu/c.php?g=253156&p=1688122
- What information is available about the industry my idea concerns? https://libguides.sdsu.edu/c.php?g=253156&p=6418369
- What guides and resources does the library have on various topics? http://libguides.sdsu.edu/business-entrepreneurship
- Is there a book I can borrow about my idea topic or entrepreneurship? https://library.sdsu.edu/help-services (click "Borrow a Book")
- Can I get help researching about my idea or the market? https://library.sdsu.edu/research-services
- Is there a librarian who can help me better understand about my idea, business, or entrepreneurship in general? https://library.sdsu.edu/help-services/ask-librarian

The SDSU library also has the *build IT* makerspace to inspire creativity and help founders prototype their ideas. See the section on *Prototyping* for more.

San Diego Public Library

The San Diego Public Library (SDPL) has 35 branches that provide spaces, resources, tools, and programs to help make your idea a reality. Although the Central Library in Downtown San Diego is the SDPL's premier location, many of the other branches have a lot of resources to offer as well.

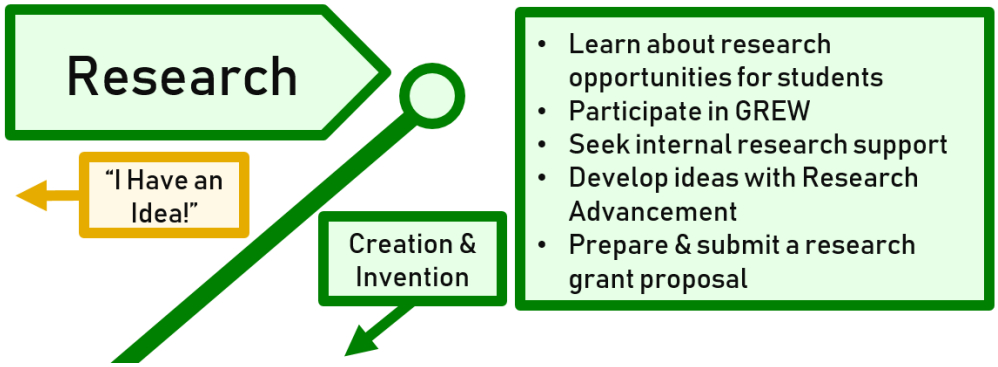
- San Diego Public Library Digital Catalog: https://sddp.ent.sirsi.net/client/en_US/default/
- SDPL eCollection: https://www.sandiego.gov/public-library/catalog-databases
- Innovation Lab with Prototyping Equipment: https://www.sandiego.gov/public-library/central-library/innovation-lab
- IDEA Lab with Multimedia and Design Software: https://www.sandiego.gov/public-library/central-library/idea-lab
- SDPL Locations: https://www.sandiego.gov/public-library/locations

More Educational Resources in this Manual

The last chapter in this manual also contains a variety of resources that founders can use to learn about entrepreneurship, innovation, and the steps on the *Path to Commercialization.*

Research

Where do researchers go to explore ideas, test hypotheses, and obtain funding?



This chapter is primarily for individuals performing research at SDSU. Although most research at the university is driven by professors and other faculty members, there are plenty of opportunities for research for students as well.

If you are *not* a researcher or performing research at SDSU, students included, return go back to the chapter on *"I Have an Idea!"* or skip ahead to the chapters *Education About Entrepreneurship* or *Creation & Invention.*

If you are a faculty researcher, keep reading this chapter to find the ways SDSU can help support your research, and how it can help once you create or invent something.

If you are an undergraduate or graduate student interested in performing research or obtaining research experience, read about *Research Opportunities for Students* in this chapter.

If you are a faculty or student researcher and you think you may have already either invented a patentable new idea or authored a creative work with commercial potential, proceed to *Creation & Invention* chapter.

Research, Generally

What is research, *anyway?*

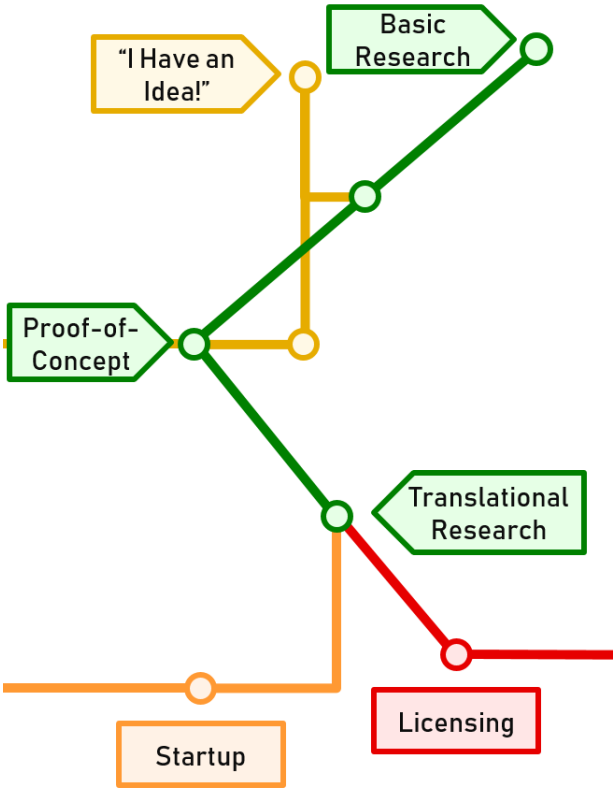
Research is the process of systematic inquiry into ideas and our understanding of the world to unearth new discoveries, creations, and inventions. Research is more broadly called Research & Development, including by the federal government, to reflect the work of building on the discoveries, creations, and inventions from research, in particular for use of those ideas by society more broadly.

Basic research, or fundamental research, seeks to understand the underlying concepts of science, natural phenomena, and human behavior.

Translational research, on the other hand, uses the breakthroughs in basic research to develop innovations with near-term market or commercial potential.

Although basic research may never reach the market or may be years from commercialization, the ground-breaking innovations in technology and human understanding often originate from basic research. Different sources of funding often support basic research and translational research. For instance, the *SBIR & STTR Programs* support

translational research and the early stages of commercial development.



Where does the money to perform research come from?

Most research requires financial support of some kind, to finance equipment, materials, time spent in the laboratory, university resources supporting research, assistance from graduate and Ph.D. students, licenses to IP, and time.

Although some universities provide internal funding for research (see *Internal Research Funding* for more), most of the financial support for research comes into the University from outside agencies and sponsors with greater financial resources.

The primary researcher on a grant administered by the University is frequently called a PI, short for principal investigator. In the United States, most R&D is still financed by the federal government via agencies such as the National Science Foundation (NSF), the National Institutes of Health (NIH), and the Department of Energy (DOE) (57% of research at SDSU is federally funded).

Research at SDSU

San Diego State University is a mid-sized research university with major research aspirations. In 2017-18 alone, SDSU faculty and staff were awarded $135 million in externally funded grants and contracts, including over $25 million from the National Institutes of Health.

756	285	$135
Awards in 2017-18	Principal researchers in 2017-18	Million in grants and contracts in 2017-18

Research activity at SDSU exceeds that of all its California State University peers. SDSU is now a top-100 public research university in terms of R&D funding, and Carnegie Foundation classifies it as an "R2 Doctoral University with Higher Research Activity."

SDSU's 285 active research faculty perform ground-breaking work in a variety of areas including virology, microbiology, electrical engineering, education, health disparities, and many others.

Learn more about research at SDSU.

- Research at SDSU and in the news: http://research.sdsu.edu/
- SDSU's Research Story: http://research.sdsu.edu/history
- SDSU Centers & Institutes: http://research.sdsu.edu/centers_institutes

Internal Research Funding for Faculty

SDSU has many intramural funding opportunities not relying on external sponsors for research faculty. These sources can provide funding for undergraduate research, graduate students, and faculty needs.

Internal funding opportunities include the following.

- The University Grants Program (UGP): Awards up to $10,000 to assist faculty in their career and research goals. https://research.sdsu.edu/research_affairs/university_grants_program
- CSU Program for Education & Research in Biotechnology (CSUPERB): Funding to seed innovation in biotechnology and diversity in the workforce. https://www2.calstate.edu/impact-of-the-csu/research/csuperb
- Other Internal Funding Opportunities: https://research.sdsu.edu/development_funding/funding_opportunities

External Research Funding for Faculty

The SDSU Research Foundation

The SDSU Research Foundation (SDURF) advances the University's mission to conduct research as public institution of higher education. The Research Foundation contracts, administers, and manages all research conducted at the University in close cooperation with SDSU and researchers. SDSURF is also designated as the owner of all IP related to research on behalf of the University. The Research Foundation also offers a variety of resources to help faculty learn about, discover, and pursue research opportunities, some of which are listed at the end of this section.

- SDSURF: https://www.foundation.sdsu.edu/

Research Advancement

The Research Advancement Division helps faculty identify and pursue grant opportunities to fund R&D in furtherance of SDSU's mission to conduct research, provide an exemplary education, and serve the community.

Among other activities, the Research Advancement Division assists faculty and deans in devising strategies to advance and expand SDSU's research endeavors; develops cooperative multidisciplinary, multi-institutional partnership programs; provides program management for a diverse portfolio of sponsored programs.

- Research Advancement: https://research.sdsu.edu/development_funding

GREW

The Grants Research and Enterprise Writing (GREW) fellowship teaches early-stage faculty how to win research funding, communicate effectively with grant officers and the media, and develop successful proposals.

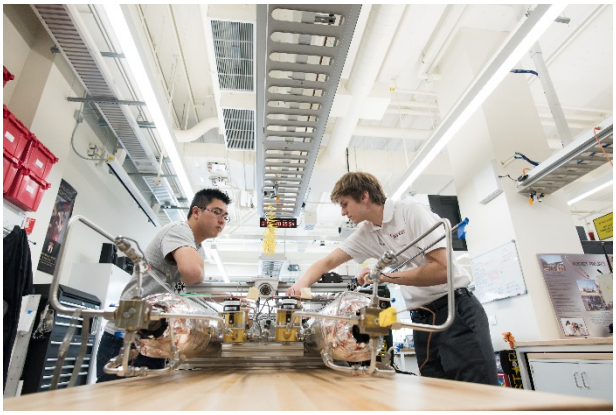
There are many benefits to participating in the GREW program: a $3,000 stipend, lessons in writing effective proposals, improved communication with different audiences, skills researching funding opportunities, and strategies for developing relationships with collaborators and program officers.

The GREW fellowship also provides a chance to visit Washington, D.C., to visit grant officers at major federal funding organizations. GREW fellows have been statistically shown to have a higher proposal approval rate than the national average.

- GREW: http://research.sdsu.edu/development_funding/grew_fellowship

Other External Funding Resources for Faculty Researchers

- Grant-Related Workshops & Webinars: https://www.foundation.sdsu.edu/communications_grant_workshops.html
- Identifying Funding Opportunities: https://www.foundation.sdsu.edu/communications_find_funding.html



- Training for Grant Proposal Development: http://research.sdsu.edu/development_funding/proposal_development
- More Help Finding Funding: http://research.sdsu.edu/development_funding/funding_opportunities

SDSU research facilities and equipment: http://research.sdsu.edu/core_facilities

Receiving, Finalizing, and Managing Research Awards

After winning a research award, Sponsored Research Contracting & Compliance (SRCC) at the SDSU Research Foundation handles receipt, review, negotiation, and completion of sponsored research agreements.

SDSURF's Sponsored Research Administration (SRA) supports University faculty with administering, managing, and complying with the terms of grants and contracts. SRA also ensures that funds are expended properly in accordance with all relevant policies.

- Sponsored Research Contracting & Compliance (SRCC): https://www.foundation.sdsu.edu/srcc_index.html
- Sponsored Research Administration (SRA): https://www.foundation.sdsu.edu/sra_index.html

Student Opportunities in Research

SDSU has a wealth of opportunities to participate in research for both graduate and undergraduate students. SDSU views research as a transformative experience to engage students in higher education *and* a path for them to better the world and themselves.

For undergraduate students, research can help students discover subjects that interest them, find new career paths they never considered before, and obtain critical skills necessary for graduate school and useful for their career.

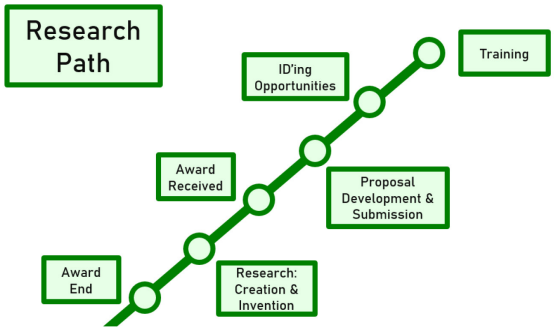
- SDSU Research for Undergraduate Students: http://research.sdsu.edu/undergrad
- The University Graduate Fellowship: Supports up to 30 graduate fellows with an annual stipend of $25,000, plus benefits. https://grad.sdsu.edu/grad_advisors/ugf
- The Presidential Graduate Research Fellowship: For non-resident graduate students who demonstrate outstanding potential for achievement. https://grad.sdsu.edu/grad_advisors/pgrf
- The Summer Undergraduate Research Program: Stipends up to $3000 to select students participating in research over the summer with a faculty mentor. http://research.sdsu.edu/undergrad/surp
- The Sally Casanova Pre-Doctoral Scholarship: Available to select juniors, seniors, and graduate students interested in obtaining research doctorates. http://www.calstate.edu/predoc/scholars/
- SDSU Student Research Symposium: Two-day event occurring each spring where SDSU students present their research, creative activities, and scholarship in a public forum. http://research.sdsu.edu/research_affairs/student_research_symposium

Commercialization of Research

Not all great science lends itself to founding a startup company or has immediate licensing potential. Some of the most advanced science on the planet has no commercial application, or at least none that is immediately identifiable.

Many scientific advances are also not protectable under intellectual property law, and thus difficult or impossible to support an entrepreneurial venture until a protectable commercial product or process can be created. Read more about intellectual property in the chapter on *Creation & Invention.*

If you're a PI and think you have made either a potentially patentable invention or a copyrightable creative work, continue reading in Creation & Invention. Or contact the *Technology Transfer Office*, which is responsible for commercializing intellectual property produced through research at SDSU.



Intellectual Property Resulting from Research

University Ownership of IP

University faculty may be required to assign intellectual property produced through research to the University, and are required by law to do so if the research is funded by a federal agency.

While the University ordinarily does not own intellectual property created by students, this may not be the case for IP created while performing formal research supported, managed, or conducted in lab space owned by the University.

The decision on whether intellectual property should be owned by the University is made by the *University Copyrights & Patents Committee.* See *Creation & Invention* for more information on intellectual property and *Evaluating the Idea* for more on ownership issues.

IP on Sponsored Research Awards

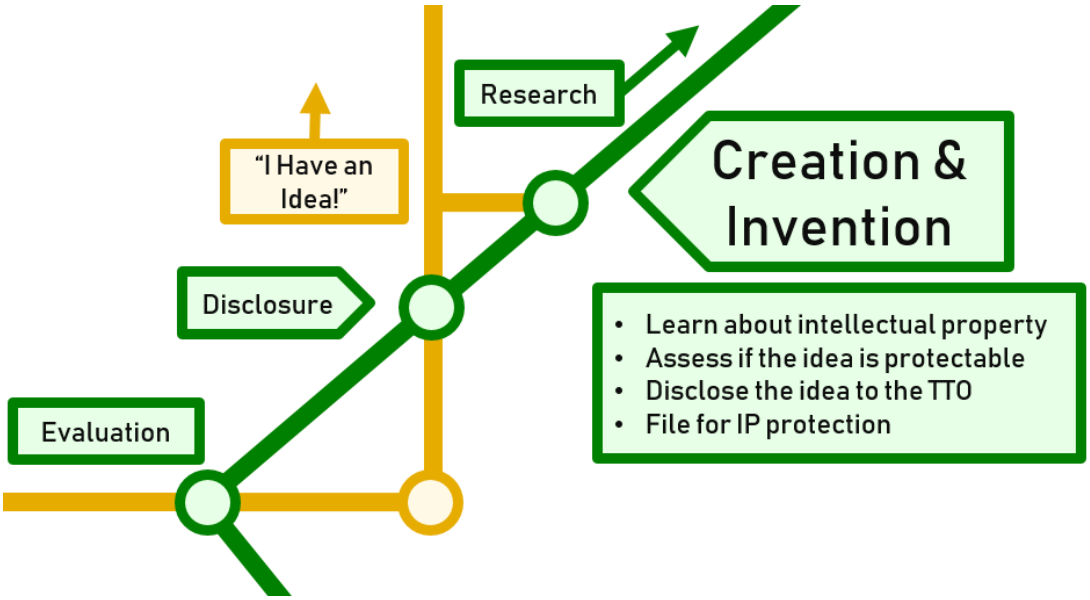
The *TTO* is responsible for negotiating the IP terms in sponsored research awards prior to receipt. There are many legal and policy restrictions that limit what SDSU is permitted to do with IP related to research.

Generally, research sponsored by the federal agencies have fixed, straight-forward terms with which the TTO is familiar. When working with other sponsors, the TTO may need to divide existing IP (background) from that resulting in the future (foreground), and IP which can be licensed versus IP that must be owned by the University.

The TTO has significant experience negotiating and concluding terms with federal agencies, small businesses, and large corporations, on how to handle IP. See *Creation & Invention* for more on IP and the TTO.

Creation & Invention

What to do with and how to protect the idea?



Ideas need protection so they can be shared with the world on the creator's terms. Intellectual property laws protect ideas so creators can profit from them or prevent others from using them without the creator's permission.

Without IP protection, creators may not be able to extract any monetary value from the idea, or prevent others from taking their idea. IP protection is important for both creative ideas and technical ones.

This chapter focuses on what creation and invention *are* in the context of intellectual property.

If your idea is itself valuable, and could be used to license to others or build a company, read about *Intellectual Property.*

If you are a faculty member who thinks you may have produced a new invention or created something potentially copyrightable, read about the *Technology Transfer Office* and *Disclosure of Inventions and Creative Works to the TTO.*

If you are someone whose idea does not rely on intellectual property for value, proceed to *Evaluating the Idea* or *Developing the Idea.*

If you need help making a model of your idea—physical or otherwise—so that others can see it or test it, consider validating your assumptions about your customers in *Evaluating the Idea,* or read about *Prototyping* in the chapter on *Developing the Idea.*

Intellectual Property

What is intellectual property?

Intellectual property (IP) is a legal framework to protect ideas as a form of property, thus allowing creators and inventors to profit and prevent others from using those ideas.

IP protection usually comes in the form of a limited monopoly to give the owner the right to exclude others from using, copying, or exploiting the idea. The IP holder can then keep the right to share the idea for itself, or grant permission to use the idea in exchange for compensation.

Why is intellectual property important?

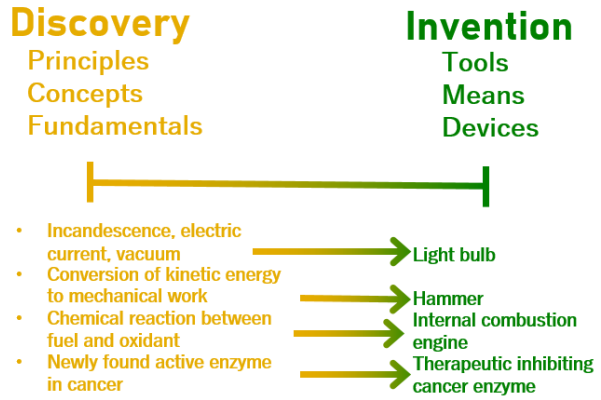
Although it's not required to commercialize an idea, most innovative new ventures require some type of IP protection to provide a competitive advantage. Without being able to prevent others from using your idea, how can you derive any value from it?

Types of businesses that do not necessarily need IP protection are service-based businesses (e.g. restaurants, legal counsel, accounting), retail businesses (e.g. convenience stores, grocers, clothing stores), commodity businesses (e.g. grain, coffee beans, iron ore), and businesses based on ideas that are in the public domain (technologies using expired patents, publishing books with expired copyrights, and businesses around innovations that are not patentable). But IP impacts even these types of businesses in surprising ways.

In short, most new ideas need some type of IP protection for creators to derive value from the idea and share it with the world. This is especially true in the context of university research, where many new ideas are born.

Is every good idea or discovery protectable by intellectual property?

No, not every good idea or discovery is protectable under IP law. Many ideas may be in the public domain, or were previously invented, or are not in a protectable form. There are plenty of socially and practically desirable reasons that not *every* good idea can receive IP protection.

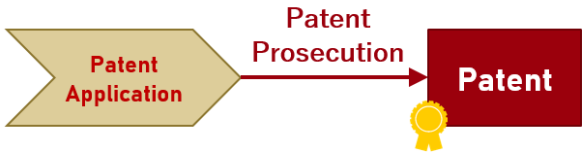


In fact, many groundbreaking scientific discoveries in basic research are not protectable under IP schemes, including patent law. Thus, it's important not to confuse "discovery" with "invention" – a discovery may revolutionize science but have little commercial value, while an incremental improvement of an existing product could be an immensely valuable patent.

Types of IP

In the United States, there are four major forms of intellectual property: patent, copyrights, trademark, and trade secret.

All of these forms of intellectual property have unique characteristics, purposes, subject matters, and methods to obtain protection. Each form of IP has its strengths and weaknesses. Entrepreneurs and creators should think creatively and strategically to protect and benefit from their ideas.



Patents

What is a patent?

A patent is an exclusive right to practice an invention. In the United States, an invention is a potentially new (or novel), useful, and non-obvious machine, article of manufacture, process (or method), or composition of matter. Because of the nature of scientific discoveries, patents are often needed to commercialize ideas resulting from university R&D.

Patents provide the owner the right to exclude others from practicing an invention for 20 years in exchange for the owner disclosing the invention and how it works to the government. The government then shares this information about the invention with the public so that other inventors can learn from it and make new inventions of their own, thus benefitting science.

How does an inventor obtain a patent?

Patent protection is obtained through a process called patent prosecution, in which the invention is disclosed to the government in a patent application. In the U.S., inventions are disclosed through the United States Patent and Trademark

Office (USPTO). The USPTO then reviews the application to determine if it contains an invention worthy of a patent.

In the United States, the government rejects a patent application in an office action, after which the patent applicant may abandon the application, amend the claims of the invention, or contest the rejection. Nearly all patent applications receive at least one office action, and responding to them is a vital part of the patent prosecution process. Because the patent process is lengthy, requires drafting from specialized attorneys, and could involve entry into countries all over the world, it is very costly.

It is important to note that one does not have an enforceable patent until *after* the patent prosecution process, when the government formally grants the claims of the patent. Until then, there is merely an application. However, pending patent applications may be licensed to others and damages for infringement may be recovered once the patent issues.

- Patent Process Overview: https://www.uspto.gov/patents-getting-started/patent-process-overview
- Legal Assistance and Resources: https://www.uspto.gov/patents-getting-started/legal-assistance-and-resources
- Patent FAQ: https://www.uspto.gov/help/patent-help#patents
- Public Patent Application Information Retrieval: https://portal.uspto.gov/pair/PublicPair

Copyrights

A copyright is a form of intellectual property that protects the exclusive rights associated with creative ideas. Among those exclusive rights is the right to reproduce ("copy") the creative expression.

There is no exhaustive list of what can be protected by copyrights, but examples include literary works (books, novels, screenplays, manuscripts, computer code), musical works, dramatic works, pictorial works, sculptural works, and even other types of expression such as architectural works and fashion designs. Not everything is copyrightable: but virtually any type of creative expression can be protected as long as it has "a modicum of creativity."

Unlike patents, copyright protection is automatic upon publication. But there are several advantages to copyright registration.

- Copyright Registration: https://www.copyright.gov/registration/

Trademarks

A trademark is a form of intellectual property identifying the source of a good or service to consumers. A trademark allows the owner to prevent others from making use of that mark. Trademarks are important because they protect consumers by allowing the consumer to trust the source of an item, and not be fooled by phony imposter goods or services.

A trademark is synonymous with the "brand" of a product, service, or company, and thus may be very important to protect. Although trademarks are protectable once they are used in commerce, there are many benefits to applying for and obtaining a trademark from the USPTO. Use of an attorney is advised for applying for a trademark.

- Apply Online for a Trademark: https://www.uspto.gov/trademarks-application-process/filing-online

Trade Secret

Trade Secret is a form of intellectual property that protects information that has economic value because of its concealment. The protected information must be kept secret by reasonable security measures.

In other words, trade secrets protect valuable private information, and the trade secret holder must work to *keep* the information secret. If a trade secret holder shares the information with the public such as in a social media post, scientific publication, or presentation, then the information loses that protection.

Common mechanisms to keep the information secret are *Confidential Disclosure Agreements (CDAs), Non-Disclosure Agreements (NDAs),* and *Employee Agreements* requiring employees to maintain the secrecy of certain information. Read more about these mechanisms in *Common Agreements.*

The biggest downside to trade secret protection is that it does not forbid a competitor reverse engineering and duplicating the idea. That is why it is advantageous to seek patent protection when the idea is easily duplicated.

Famous trade secret examples include the formula for Coca-Cola, KFC's Original Recipe 11 herbs and spices, and the composition of WD-40 (made in San Diego).

Other Unofficial Types of IP

- Data: Although data is not formally protected as a form of intellectual property in the United States, many licenses treat it like IP through contract. Some data and compilations of data can be protected under copyright law, as confidential information, or even trade secret.
- Confidential or Proprietary Information: Other proprietary information that is not protectable through IP law can be protected under a *CDA* or *NDA,* or confidentiality provisions of other agreements. The SDSU Research Foundation is responsible and the only party with signatory authority on nearly all NDAs related to university research. Contact the TTO for a copy of SDSURF's form NDA, or to negotiate an NDA with an external party.

The TTO

The SDSU Technology Transfer Office (TTO) helps commercialize inventions and creative works produced with significant institutional support. As such, the TTO is responsible for reviewing, overseeing, and managing all the IP produced through campus research.

$500K+ in royalties annually

#126 In commercialization output among U.S. universities, according to the Milken Institute.

Although "technology" is in the *TTO's* name, and most technology transfer offices originated around science and engineering innovations, the TTO focuses on creative works as well as inventions. The TTO has successfully commercialized several creative works associated with research.

The primary objective of the TTO is to serve the faculty. The TTO's other main goals are to help move ("transfer") the products of research to the market, and deploy research innovations for the public benefit. Valuable services the TTO provides for University faculty include:

- Reviewing disclosures, assessing IP ownership, and presenting disclosures to the UCPC (see *Disclosure of Inventions & Creative Works* and *Evaluating the Idea*).
- Obtaining IP protection for ideas.
- Financing and managing the patenting process.
- Marketing and identifying potential licensees.
- Negotiating, drafting, and reviewing license agreements.
- Reviewing *NDAs* and *CDAs.*
- Providing commercialization, business, and legal expertise.
- Serving as a resource on IP and commercialization for the campus.
- Connecting inventors and creators with mentors and investors.
- Negotiating IP terms in sponsored research awards.
- Other Services Offered by the TTO: http://research.sdsu.edu/tto/tto-services

Furthermore, 50 percent of the net royalties generated from University IP is shared with inventors and authors. This is a favorable share for inventors and authors by university standards, and

an extremely generous share by corporate standards. Unfortunately, the TTO's services are unavailable for IP not owned by the University, as that would create a conflict of interest.

Visit http://research.sdsu.edu/tto for more information on the *TTO.* Contact the TTO with any questions on IP generally or about whether to disclose an idea to the TTO

- Kyle Welch, Licensing Manger, Technology Transfer: kwelch@sdsu.edu
- Tommy Martindale, Director, Technology Transfer: tmartindale@sdsu.edu

Disclosure of Inventions & Creative Works

Disclosing to the TTO

It is important for faculty or students participating in research to disclose inventions and creative works related to research or produced with institutional support to the *TTO* as soon as practicable.

Reasons to disclose creations and inventions as soon as practicable are:

- A public disclosure of an invention can block patent rights throughout the world. It is important to disclose inventions to the TTO prior to publication of inventions or demonstration of inventions to the public.
- The TTO can help protect the idea and the research.
- The TTO can advise on next steps to commercialize the idea, as well as provide supporting resources and services.
- The terms of federal law and sponsored research contracts often require the disclosure of resulting inventions. See *Evaluating the Idea* for more.
- SDSU faculty are required to disclose all inventions, creative works, and software arising from sponsored research, resulting from institutional support, or created during University employment under the terms of employment, the terms of receiving funds from the Research Foundation, and University Senate policy on intellectual property, patents, and copyrights.

The TTO asks creators to allow it at least 30 days to evaluate an invention or creative work. If the TTO doesn't know about the invention, then it can't help share the idea with the world.

- Disclose an Invention to the TTO via its Inventor Portal at: https://west.inteum.com/sdsu/inventorportal/login.aspx.

Upon disclosure to the TTO, inventions and creative works are reviewed and shared with the *University Copyrights & Patents Committee* for a determination on ownership. See *Evaluating the Idea* for more.

Disclosing Inventions & Creative Works to Other Parties

In addition to disclosing IP created or invented through research or University resources, there may be other IP disclosure requirements for the University, federal government, individual agencies, and other funding sponsors.

For example, when performing research and development under grants from federal agencies, contractors are obligated to disclose inventions developed under the award to the federal government, elect title to such inventions, and allow the government to take ownership of inventions in certain circumstances.

The *TTO* reports elections of title and inventions supported with federal funding to agencies through iEdison, while the *SDSU Research*

Foundation shares new inventions resulting from grants to agencies through close-out reports.

There are important consequences for not disclosing inventions or elections of title to federal agencies, including a possible forfeiture of IP rights to the government.

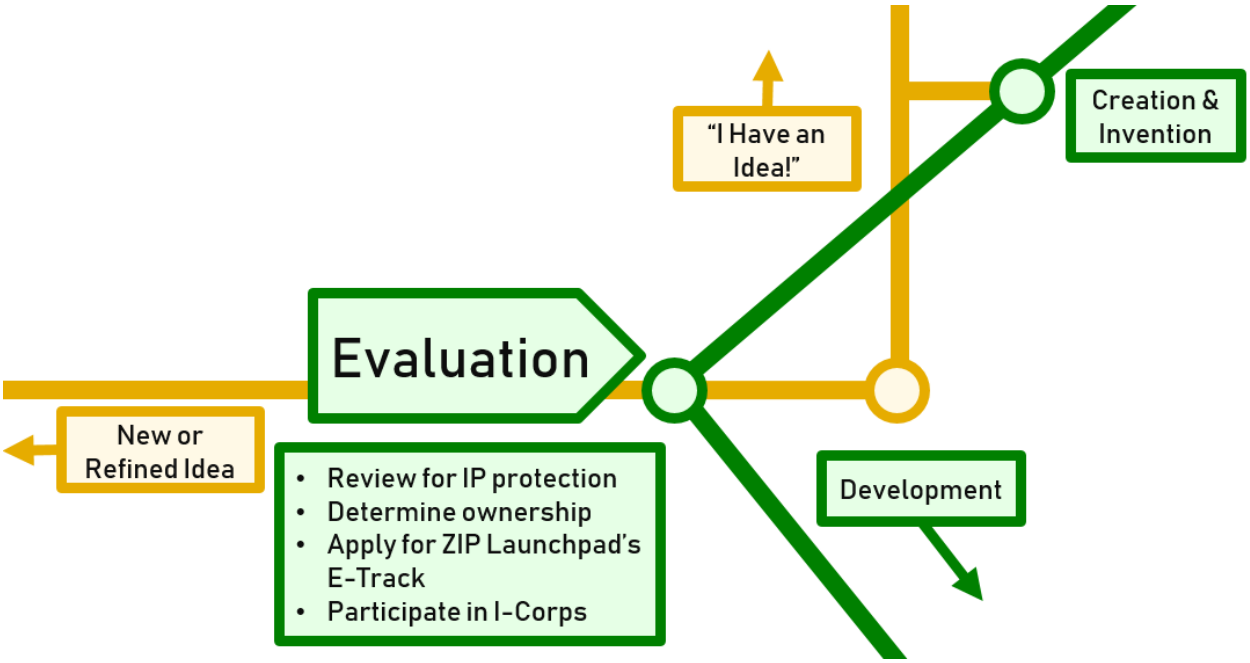
Other important situations under which it may be important to disclose IP include:

- When performing R&D for an external sponsor under a sponsored research agreement, cooperative research and development agreement, a right of first refusal, or the terms of a license
- When employed at a company that requires employees to disclose inventions to their under the terms of their employment.

Entrepreneurs and eventual company founders should take great care to make sure that the employees and the contractors they work with are obligated to disclose inventions to the business. See *Common Types of Agreements* for more information on these types of agreements.

Evaluating the Idea

How to assess how good the idea is and decide what to do next?



At this stage, you should know places you can go for *Education About Entrepreneurship & Innovation,* and whether you have some intellectual property from your *Creation & Invention.* Now it is time to evaluate your idea to see if it is any good, what can be done to improve it, and who owns it.

If you have a disclosed an invention or creative work to the TTO related to University research, go to *University Ownership of Intellectual Property* to understand that evaluation process.

If you are a student, staff, or faculty member who needs to evaluate whether your idea is appropriate for a business venture, visit the *ZIP Launchpad E-Track* or the *CSU I-Corps Site,* or the other resources later in this chapter.

Evaluating for IP Protection

Last chapter discussed the act of *Creation & Invention* itself: but not every great idea can be protected as a form of *Intellectual Property.* For example, an orchestral piece in the public domain can't receive copyright protection just because it's sampled in a new song, and a discovery that a naturally occurring enzyme plays a role in mitigating the effects of Alzheimer's may not receive patent protection just because it's ground-breaking.

As discussed in *Patents,* only new (or novel), useful, and non-obvious machines, articles of manufacture, processes (methods), or compositions of matter can receive patent protection. Evaluating whether an idea is eligible for patent protection is the same thing as evaluating its patentability.

One of the steps in determining the patentability of an invention is in performing a prior art search. In a prior art search, the evaluator of an invention reviews existing public disclosures that may be used to show an invention is not new or is obvious. Although there are a variety of resources for prior art searches, two of the most well-known free resources are:

- Lens.org
  https://www.lens.org/lens/new-search

- Google Patents https://patents.google.com/advanced?scholar

For reasons discussed in the last chapter, evaluating whether an idea is patentable or eligible for IP protection could be one of the most important steps for sharing an idea with the world or deriving value from it.

If the idea can't be protected, perhaps it is best to come up with a new or refined idea, or share the idea with the world without protection. If the idea can be protected with IP, then there may be a viable path to commercialize the idea.

University Ownership of Intellectual Property

What is the Bayh-Dole Act and why is it important for ideas related to university research?

In 1980, Congress enacted the Bayh-Dole Act, a law which gave universities the ability to own the inventions produced by federal research. See *Intellectual Property* in *Creation & Invention* for more info on IP, generally.

The Bayh-Dole Act standardized the patent and intellectual property clauses in grants from federal agencies. These clauses provide for the research institution to own IP, and new regulations even *require* inventors to assign inventions to the University.

Accordingly, SDSU must own much of the IP produced through faculty research. The Bayh-Dole also impresses upon the university to commercialize the results of that research. The *SDSU Research Foundation* is the designated auxiliary to hold IP on behalf of the university through its operating agreement with the university and the CSU.

In addition the Bayh-Dole Act, why else must the university own IP?

In addition to compliance with the Bayh-Dole Act, there are many other reasons for the University to own IP. These reasons include: maintain the University's non-profit status, to abide IRS provisions against private inurement, to advance the University's mission of public impact through research, to protect the University's ability to perform research and use the results of prior research efforts, and many others.

It is the purpose of the *TTO* to commercialize inventions and creative works produced on campus through research, as discussed in more detail in the chapter on Creation & Invention.

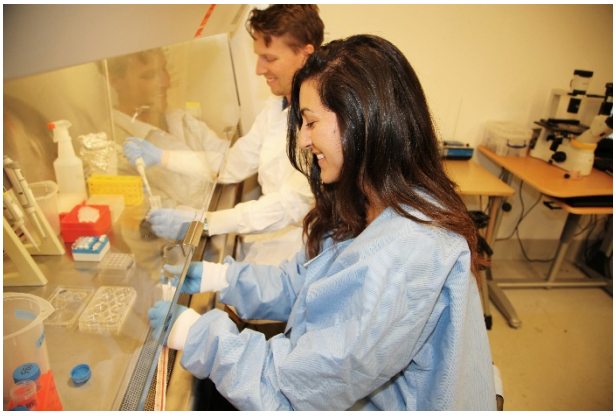
When does the university own intellectual property?

The *San Diego State University Research Foundation (SDSURF)* is the designated party to own IP related to research on behalf of the University.

The primary source for the University's policies on IP ownership are the SDSU University Senate Policy File sections on Patents and Copyrights, Trademarks, and Trade Secrets. These sections set out how the committee should interpret the level of institutional support for IP developed through use of University resources.

The general rule of thumb is that the University owns IP produced "through significant institutional support." Determinations of ownership are made by the *University Copyrights & Patents Committee,* which is composed of faculty peers and University staff.

There are specific exceptions when faculty retain IP they created for "traditional faculty developed academic works" such as books, articles, class notes, and syllabi.



Generally, the University does *not* own IP produced by students unless a student is directly participating in faculty-directed research.

Employment agreements and the terms of accepting funding from the Research Foundation supplement the Faculty Senate policy. These sources may make faculty responsible for knowing the relevant policies, disclosing inventions or creative works, or assigning works to the Research Foundation.

The University Copyrights & Patents Committee (UCPC)

The University Copyrights & Patents Committee (UCPC) is a neutral committee of 12 SDSU faculty and staff members that serves the interests of the faculty, the University, and the Foundation.

The UCPC's primary responsibility is to advise the Vice President for Research on ownership of IP created with institutional support at the University, or by faculty disclosing inventions and creative works to the TTO. The UCPC's other responsibilities include advising changes to University or Faculty Senate Policy, among others.

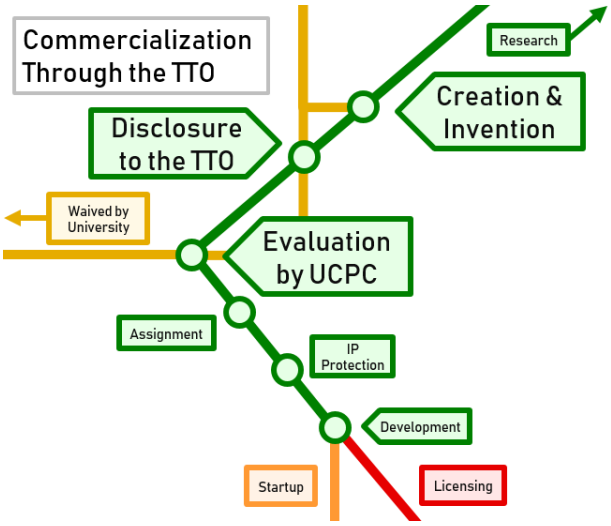
How does the UCPC determine whether the University should own IP?

The UCPC bases its determinations on a technical assessment (TA) prepared by the *TTO* containing facts from the disclosure, the level of institutional support, a patentability determination, an analysis of the market, and an evaluation of the commercial viability.

The TTO presents its finding to the UCPC, which then makes a determination on ownership after discussing the situation, interpreting Senate Policy, and any other relevant guidance. The UCPC generally meets on the first Tuesday of every month.

Read more about when to disclose IP in *Disclosures of Inventions of Creative Works to the TTO* in the chapter on *Creation & Invention.* For more information visit:

- Disclose an Invention through the TTO Inventor Portal: https://west.inteum.com/sdsu/inventorportal/login.aspx
- The Path to Commercialization through the TTO: http://research.sdsu.edu/tto/path-to-commercialization
- SDSU University Senate Policy Files: https://senate.sdsu.edu/policy-file.aspx
- The University Copyrights & Patents Committee: https://senate.sdsu.edu/copyrights-patents-committee.aspx



What happens after the UCPC makes a decision on ownership?

After a disclosure is presented to the UCPC, the committee makes a determination on whether it is proper for the University to exercise ownership to the IP.

If the UCPC determines the University should own the IP, that recommendation is given to the Vice President for Research, who may accept or reject the determination. If accepted, the TTO sends the relevant inventors and authors assignment and royalty share documents. Then the TTO may convene with the inventors or authors about the next steps for commercialization — see *Developing the Idea* for more.

If the UCPC determines the University should waive any applicable IP rights in the invention, and the Vice President for Research agrees, then inventors or authors are free to own the IP associated with the disclosure.

If the invention is associated with federal funding, the funding agency must be notified of the University's decision on whether to take title. The agency will then decide on its own whether to allow the invention to pass to the inventor.

ZIP Launchpad E-Track

The ZIP Launchpad has three different stages in its incubator programming to turn your big idea into a success.

Stage 1 is the ZIP Launchpad Experience Track (E-Track), an intensive 10-week series of workshops based on lean startup methodology. The goal of E-Track is to help participating teams evaluate whether they have a problem worth solving with their idea.

Entrepreneurs in E-Track will build empathy with customers, validate key assumptions about the problem and solution, and lay the foundation for a scalable business.

In E-Track, the ZIP Launchpad coaches teams on the key aspects of a business, and helps them plan the next steps to develop their idea so they can proceed with confidence.

- E-Track Program Overview: http://ziplaunchpad.sdsu.edu/program-overview
- Past E-Track Graduates: http://ziplaunchpad.sdsu.edu/e-track-grads
- ZIP Entrepreneur Insights: http://ziplaunchpad.sdsu.edu/entrepreneur-insights
- Apply to the ZIP Launchpad: https://www.f6s.com/ziplaunchpad/apply

The ZIP Launchpad provides the following resources for teams enrolled in E-Track.

- 24/7 Access to the ZIP Launchpad: Students can access the ZIP Launchpad's collaborative workspace and meeting space in the EIS Complex with their Red IDs.
- Prototyping Tools: The H.G. Fenton Company Idea Lab provides teams with equipment for Prototyping products and hardware, while mentors support the prototyping of software.
- Mentorship: Staff members mentor teams and successful teams are assigned mentors from experienced advisors from different industries.
- Legal Guidance: The ZIP Launchpad offers teams free legal guidance in the form of workshops and scheduled office hours from supporting law firms Mintz Levin and Troutman Sanders.

See the *ZIP Launchpad Launch Tracks* for more information on Stages 2 and 3 following E-Track, and *Business Planning & Lean Startup Methodology* for more on lean startup principles.

CSU I-Corps Site

The California State University (CSU) I-Corps Site is a program offered by *CSUPERB* and in tandem with SDSU.

The CSU I-Corps Site is funded by the NSF I-Corps (for "Innovation Corps") program, and teaches scientists to leave the laboratory to accelerate their ideas toward positive impact.

I-Corps helps teams verify that they have a problem worth solving with their idea, and make a go/no go decision on whether to proceed with the business model for the idea.

Who is eligible for the CSU I-Corp Program? What does I-Corps provide? When is it? How do I apply?

- Who: Faculty and students led by any CSU researcher at the 23 CSU campuses (3 team members plus 1 biotech industry mentor).
- What: A potentially protectable research idea related to the biosciences. See *Intellectual Property* for more information on ideas that may be protectable.
- What's Provided: teaching, mentoring, networking opportunities, and a microgrant of a thousand dollars or more to facilitate customer interviews and travel.
- When: fall and spring cohorts, as well as summer "sprint" programs.

Teams that receive a "Go" decision from the judges at the I-Corps Site level are eligible for the national I-Corps Node program, which provides $50,000 to help teams further validate their idea.

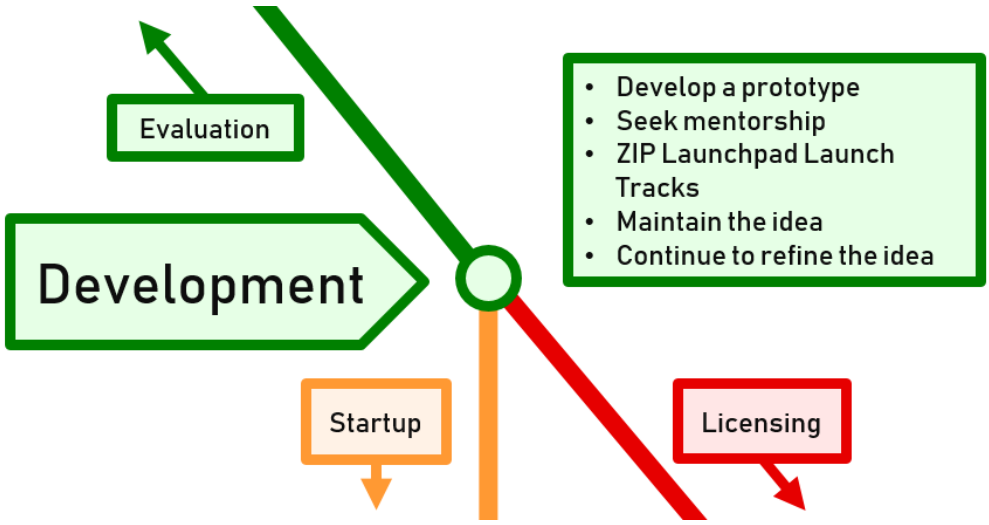
After participating in I-Corps, teams are more likely to receive funding from the *SBIR & STTR Programs*, as well as other translational research funding from the NSF.

Agencies other than NSF have adopted the philosophy of I-Corps, and the federal government will likely continue to emphasize the program's ideas to broaden the impact of research it funds.

- About The CSU I-Corps Site: http://www.csuperb.org/csuicorps/biosciences-site/about-us/.
- NSF Innovation Corps: https://www.nsf.gov/news/special_reports/i-corps/
- I-Corps Nodes: https://www.nsf.gov/news/special_reports/i-corps/nodes.jsp
- I-Corps at NIH: https://sbir.cancer.gov/programseducation/icorps

Developing the Idea

How to continue improving the idea and prepare for commercialization?



Now that you have evaluated the idea, verified some assumptions, and learned you have a problem worth solving, it is time to develop that idea further as you prepare to launch your idea out into the world by licensing it to others or forming a startup company.

If you need help making a model of your idea—physical or otherwise—so that others can see it or test it, read about *Prototyping* and the resources available to aid with that process.

If intellectual property is an important component of your idea and potential business venture, visit *Continuing to Protect the Idea.*

If your idea concerns University-owned IP as discussed in Developing the Idea, visit *Next Steps For University IP.*

If you need an experienced entrepreneur to provide valuable insights, intelligence, and guidance, read about *Mentorship* for help finding a mentor.

If you want to learn more about entrepreneurship from people in the community and put your idea to the test with other entrepreneurs, read about *Events* and *Competitions for Entrepreneurship & Innovation.*

If you need help laying the groundwork for your idea for launch, or with some of the ins and outs and administrative burdens of commercializing an idea such as compliance, legal help, and conflicts of interest, visit *Maintaining the Idea.*

ZIP Launchpad Launch Tracks

Teams that completed the *ZIP Launchpad E-Track* (in *Evaluating the Idea*), can apply for and enroll in the ZIP Launchpad Launch Tracks to continue forwarding their idea.

While the *ZIP Launchpad E-Track* focuses on determining whether there was a problem worth solving with the idea, Launch Track #1 focuses on verifying if there is a product worth building with the idea. In other words, Launch Track #1 focuses on developing a working prototype of the idea.

The results of Launch Track #1 determine if the idea is suitable for Launch Track #2, which focuses on whether the idea can support a successful business. Founders will learn how to pursue the *Funding* needed to push the idea forward and how to obtain admission to one of the *Incubators & Accelerators* in San Diego or elsewhere. These ideas and concepts are

discussed in more detail in the *Forming a Startup* chapter.

Teams participating in the Launch Tracks receive all the resources teams in the *ZIP Launchpad E-Track,* in addition to the following.

- Ability to apply for up to $5,000 in *Funding* from the *Zahn Success Fund*
- Introduction to mentors and domain experts
- Support for business competitions
- Paid attendance at SD Networking Events
- Access to Amazon Web Services
- Support from service provider partners
- One-on-one office hours with advisor
- Connections to ZIP Launchpad Advisory Board members
- Office hours with faculty in the SDSU Fowler College of Business
- Introductions to investors who could fund your idea

Prototyping

A prototype is a preliminary representation or model of an idea to design, test, or demonstrate the idea. Prototyping is a fundamental part of developing an idea, and the heart of refining a product for commercialization.

Prototyping can come in a variety of forms, depending on the idea. Sometimes it can be a crude representation of an invented product, or a beta app to test fundamental software features.

H.G. Fenton Company Idea Lab

The H.G. Fenton Company Idea Lab, provides a range of machines and resources that students use to build, test and iterate their products.

Entrepreneurs receive training in the latest rapid prototyping technologies available in the lab, and use the tools to quickly prototype and test their ideas. These resources help teams deliver an effective solution to their customers in the shortest time possible.

The H.G. Fenton Company Idea Lab has a 3D printer, a CNC router, a desktop mill, a laser cutter, and an electronics workstation. It is located next to the ZIP Launchpad in the EIS Building on campus.

- http://ziplaunchpad.sdsu.edu/hg-fenton-lab

build IT @SDSU Library

A great place to prototype and further develop an idea, build IT at the SDSU Library is a student-run makerspace designed to foster creativity and innovation. The build IT space provides a physical location where anyone can gather to explore, build, and learn through sharing resources and knowledge, working on projects, and networking. With its central location in the SDSU Library, access to build IT is available to *anyone* on-campus regardless of their discipline or expertise.

The build IT makerspace has a variety of machines for prototyping an idea including a 3D printer, a 3D scanner, a digital die cutter, a CNC milling machine, equipment for soldering and welling, and others. It also offers training sessions on its machines, project consultations, resources offered by the SDSU library, and other educational and training programs.

- build IT home: https://buildit.sdsu.edu/
- Training sessions on build IT equipment: https://buildit.sdsu.edu/home/learn/training-sessions/
- Reserve build IT equipment: https://buildit.sdsu.edu/home/equipment/reservations/
- SDSU library resources: https://buildit.sdsu.edu/resources/library-resources/

See the chapter on *Education* for more about the *SDSU Library* or prototyping tools available at the *San Diego Central Library.*

Other Prototyping Resources & Events

- Art + Design FLab at SDSU: a place for engaging with the tools of digital fabrication in pursuit of a wide range of creative endeavors. https://art.sdsu.edu/art-design-flab/
- Maker Faire San Diego: a venue for engineers, artists, and other makers to share experiments, projects, and hobbies. https://sandiego.makerfaire.com/about/

Ongoing Protection of IP

The *Creation & Invention* chapter discussed how intellectual property is a core part of the value of an idea. But the initial IP paperwork may only be the first part of an ongoing process of obtaining, maintaining, and enhancing IP protection for your idea.

It is important to continue thinking about IP and if or how it can provide value to your idea throughout the entire journey through the idea. Now that you have moved past *Evaluating the Idea,* ask yourself the following questions.

- Did I protect my original underlying idea?
- Do I need to protect my underlying idea or any new matter after *Evaluating the Idea*?
- Is there pending IP that needs to be managed?
- What are the next steps in the patent prosecution process, if any?
- How do I obtain the broadest IP protection as possible?
- Do I have a platform technology or creative work?
- Is there a specific application of the platform or underlying idea I should focus on commercializing or protecting?
- Are the potential costs of maintaining IP protection worthwhile for my idea or its market?
- What is my IP strategy going forward?

These questions should be revisited throughout the *Path to Commercialization,* including at the *Startup* and *Licensing* stages.

Continuing to Develop University IP

If SDSU owns IP as determined by the UCPC, then the next step is to ascertain a path forward to commercialization. What is the best way to move the idea to the market for the public benefit? How do founders turn the idea into impact?

Contact the TTO for consultation on the next steps in the commercialization process. The next steps could include one or more of the following:

- Setting technical or commercial milestones to strive for to improve the viability of the idea.
- Performing market research and developing market materials for potential investors or licensees.
- Participating in the *CSU I-Corps Site* or national I-Corps Node program.
- Releasing a software program via an open source license.
- Examining the inventors' or authors' network for subject matter experts or potential licensees.
- Identifying potential licensees and contacting them to assess interest and obtain feedback.
- Sharing or presenting the idea with local partners to obtain feedback or find a mentor (see *Mentorship through the TTO* for more information).
- Building a startup company around the idea.

For a review on when to disclose inventions or creative works to the TTO or when the University owns IP, visit *Creation & Invention* and *Evaluating the Idea.*

Mentorship

One of the most important ingredients to successfully developing and commercializing an idea is mentorship. Mentors provide advice and counsel to creators based on their own personal experiences and expertise.

The insights provided by mentors can be immensely valuable to aspiring creators, helping them figure out how to make the most of their idea while avoiding many of the missteps and pitfalls other creators face without guidance.

Mentorship through the ZIP Launchpad and Lavin

Both the *ZIP Launchpad* and the *Lavin Entrepreneurship Center* have programs and resources for mentorship.

The ZIP Launchpad has staff mentors for teams participating in its program. Teams are assigned a mentor from its network of community members and experienced entrepreneurs once the teams meet enough commercialization milestones.

All Lavin students are provided a mentor who is an experienced businessperson or Lavin alumni to guide them through Lavin's two-year program. (http://lavincenter.sdsu.edu/programs/Lavin-VentureStart/LavinStudentEntrepreneur)

- http://ziplaunchpad.sdsu.edu/team-resources

Aztec Mentor Program

The Aztec Mentor Program connects students with alumni and professional mentors to support them as they progress into their careers. Eligible to juniors, seniors, and graduate students of all majors, the experience can be immensely rewarding for both mentors and mentees.

The result of a partnership between SDSU Career Services and SDSU alumni, the Aztec Mentor Program has made over 10,000 matches to date and has grown every year since its inception in 2013.

- https://amp.sdsu.edu/about

Mentorship through the TTO

Faculty and students commercializing University IP can contact the Technology Transfer Office for help finding a mentor. The TTO can leverage their contacts and relationships with partners such as regional accelerator CONNECT to help researchers find a mentor to provide advice on how to further develop their idea.

Students participating in the ZIP Launchpad can seek a mentor through the Launchpad program, or use one of the following other resources for finding a mentor, especially in the San Diego region.

Other Resources for Finding a Mentor

-
- SCORE San Diego: A volunteer, non-profit organization offering mentors who provide free and confidential business assistance. https://sandiego.score.org/content/find-mentor-41
- Startup San Diego Mentor Program: Provides early-stage companies with access to experienced mentors to help them to develop and grow. https://startupsd.org/sign-up-for-mentorship-hours/?utm_source=greenrope&utm_medium=email&utm_content=8242&utm_campaign=4986626

Become a Mentor for SDSU Students and Faculty Creators

Do you have experience in industry, business, or entrepreneurship? Are you interested in becoming a mentor for SDSU student or faculty entrepreneurs?

- Contact Erica Snider, Marketing and Operations, at the *ZIP Launchpad:* esnider@sdsu.edu
- Apply to become a mentor at the *Lavin Entrepreneurship Center:* http://lavincenter.sdsu.edu/programs/Lavin-VentureStart/LavinMentorEntrepreneur

- Reach out to the *SDSU TTO:* tto@sdsu.edu

Events

Events at SDSU and throughout the region are important to make connections, learn more about forwarding your idea, win prize money to support your idea, and further develop your idea and the pitch for it. They're also a great place to show off your idea or invention.

For instance, dozens of SDSU-affiliated innovators and entrepreneurs participated in *San Diego Startup Week* in 2018 alone.

- http://ziplaunchpad.sdsu.edu/sdsw_2018

ZIP Launchpad Events

The ZIP Launchpad has events throughout the year to pitch their ideas, learn about prototyping, and engage in design thinking.
http://ziplaunchpad.sdsu.edu/events

Other Important San Diego Events

- San Diego Startup Week: One of the premier events of the year in San Diego to share your idea, meet other founders, and learn run a startup company.
https://sandiegostartupweek.com/
- Other Startup San Diego Events: There are several events affiliated with the organization running *San Diego Startup Week,* including 1st Mondays, Convergence, and March Mingle.
https://startupsd.org/events/
- UCSD Office of Innovation and Commercialization Events Calendar: Calendar listing entrepreneurship and innovation events occurring at UCSD and other regional partners of SDSU.
http://innovation.ucsd.edu/events/
- SD Tech Scene: Calendar of technology and startup events throughout San Diego.
http://sdtechscene.org/

Competitions for Entrepreneurship & Innovation

Competitions for entrepreneurs and innovators are a great way to win money, further develop an idea, receive verification of a business model, excite investors, draw attention, and prove the mettle of your idea.

Even if you are not participating or pitching at a competition, such contests are great events to learn from entrepreneurs, further develop your pitch, and network with potential investors and community members.

Idea or Pitch Opportunities at SDSU

- ZIP Launchpad Review Panel: Pitch your idea to a review panel at the end of participation in *ZIP Launchpad E-Track* or *Launch Track* programs to receive feedback on your idea.
- ZIP Launchpad Competitions: ZIP Launchpad teams compete annually for approximately $10,000 in cash prizes to help grow their ideas
- VentureStart Competition: Student business model competition hosted by *The Lavin Center* and based on lean startup principles.
http://lavincenter.sdsu.edu/programs/VentureStart-Competition/Judging-Criteria
- CSU Annual Biotechnology Symposium: Event hosted by *CSUPERB* with poster presentations and awards for biotechnology innovation throughout the *CSU.*
https://www.csuperb.org/symposium/

Other Local Pitch Competitions & Contests

- San Diego Innovation Showcase: Exhibition of early-stage businesses originating from local research institutions for the entrepreneurial and investment communities. The SD Innovation Showcase is hosted by the *San Diego Innovation Council,* of which SDSU is a member, and usually occurs in October. SDSU innovators can contact the *Technology Transfer Office* about

participation as either a pitching company, sponsor, or poster presenter. http://sandiegoinnovationcouncil.org/showcase/

- Quick Pitch: Competition hosted by *Tech Coast Angels* and *San Diego Venture Group* pitting fundable startup companies against one another to compete for prizes, including a first prize of $50,000. https://quickpitchsd.com/
- EvoNexus Demo Day: Showcase of companies participating in local incubator Evonexus

Maintaining the Idea

Having a good idea is only the start of sharing the idea with the world. Beyond evaluating and developing the idea is the ongoing process of *Maintaining the Idea,* or performing the supplementary activities to ensure the idea remains legally and commercially viable. Maintaining the idea is not usually the most fun part of being a founder, but mistakes can be lethal to the idea's longevity.

Compliance

Compliance is the process of following and adhering to rules in the process of developing your idea. These rules come in many forms: federal laws, state laws, administrative regulations, sponsor award terms, agency guidelines, SDSU policies, and many others.

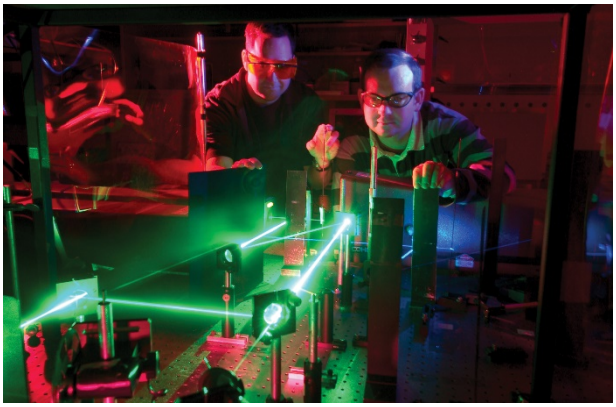
Grants often have requirements institutions and researchers must follow in order to fulfill the terms of the award, and refer to specific federal laws, regulations, and agency directives.

Compliance can refer to following rules in a variety of subject matters, many of which are discussed in more detail throughout this manual. Compliance generally can include, among other things:

- Conducting research with human subjects according to certain guidelines.
- Conducting research with animal subjects according to certain guidelines.
- Transferring or receiving biological materials, usually through *Material Transfer Agreements* (MTAs).
- Obeying safety policies and directives
- Disclosing conflicts of interest, particularly financial ones (see *Conflicts of Interest* for more).
- Following export control laws (see *Export Controls*).
- Disclosing intellectual property created in performing research under an award to either the TTO or the funding sponsor (see *Creation & Invention* for more).
- Licensing or optioning intellectual property created under an award.
- Receiving, handling, and administering the funds awarded in the grant.
- Submitting manuscripts for review prior to publication.
- Sharing or publishing data, software, and search results.
- Attributing the source of the funds in publications and other public appearances.
- Adhering to Export Controls (see *Export Controls* for more).
- Following other sponsored research contract terms.

The Division of Research Affairs (DRA) is the central SDSU office with oversight of research management, regulatory compliance, research assurances, and research promotion. Learn more at the following links.

- Research Affairs Home: http://research.sdsu.edu/research_affairs
- Animal Care: http://research.sdsu.edu/research_affairs/animal_care
- Biosafety: http://research.sdsu.edu/research_affairs/biosafety
- Material Transfer Agreements: http://research.sdsu.edu/research_affairs/biological_mta
- Human Subjects and Institutional Review Board (IRB): http://research.sdsu.edu/research_affairs/human_subjects
- Federal Aviation Administration (FAA) Drone Committee: http://research.sdsu.edu/research_affairs/faa_drone_committee



Responsible Conduct of Research: https://sdsuedu.sharepoint.com/sites/GRA/res/RA/RCR/SitePages/Home.aspx (SDSU Intranet access needed to access site)

Regulatory Approval

In addition to the other *Compliance* issues, regulatory approval is a specific type of compliance that ensures a product or service is complying with the law and can be offered to the public.

Although there are a variety of types of regulatory approval, one of the most important concerns products or services in biotechnology, where the U.S. Food & Drug Administration has requirements to ensure a product or service designed for humans is safe for public consumption. In the biotech sector, completing clinical trials to obtain this regulatory approval may be the single most important and significant hurdle to commercializing the idea.

- Learn more about FDA regulatory approval at https://www.fda.gov/Training/learningportal/default.htm

Help With the Law

Nearly every idea requires help from attorneys at some point along the way to navigate the legal hurdles faced taking an idea out into the world. Whether your business needs help forming as an entity, you need help securing patent protection for your invention, or you're an individual author who needs help dealing with a cease-and-desist letter from an alleged copyright holder, you could need legal assistance.

Legal Resources for the SDSU Entrepreneurship & Innovation Community

- Lavin Entrepreneur Advocacy Program (LEAP): The *Lavin Entrepreneurship Center,* the University of San Diego School of Law's Entrepreneur Clinic, and Duane Morris LLP, collaborate to provide legal assistance for Lavin Entrepreneur students and their startup businesses. http://lavincenter.sdsu.edu/programs/Leap-Program/
- ZIP Launchpad Legal Partners: Free legal basics workshops and scheduled office hours are furnished to teams participating in the *ZIP Launchpad* from firms Mintz Levin and Troutman Sanders. http://ziplaunchpad.sdsu.edu/team-resources

Conflicts-of-Interest (COI)

An SDSU faculty member must disclose "significant" financial interests that "may influence his or her institutional responsibilities or the conduct of the research activity" to the Conflict of Interest Committee.

If necessary, the faculty must enter a management plan approved by the Conflict of Interest Committee. The management plan will ensure that conflicts of interest do not impair University research. The Committee determines what, if any, conditions or restrictions should be imposed on the investigator or research protocol in order to manage, reduce or eliminate such conflicts of interest.

Many agencies and other sponsors have their own, independent conflict of interest policies.

- Learn more about the conflicts of interest policy at SDSU, individual federal agencies, and other sponsors, http://research.sdsu.edu/research_affairs/conflict_of_interest
- Contact the Division of Research Affairs to disclose significant financial interests, or ask questions about what constitutes a "significant" financial interest. dra@mail.sdsu.edu.
- Contact Rick Gulizia with questions about conflicts of interest and the Conflicts of

Interest Committee, rgulizia@sdsu.edu.

Export Controls

Export controls are a collection of laws and regulations that prohibit the sharing of information or transfer of specific items outside U.S. borders or to foreign nationals of some countries.

Some forms of export controls include International Traffic in Arms Regulations (ITAR), Export Administration Regulations (EAR), Department of Treasury regulations, and regulations from the Office of Foreign Assets Control.

Export control clauses are in many contracts, non-disclosure agreements, and sponsored research contracts. Many of the prohibitions concern defense and military-related technologies. Notably, there are several prominent export control exceptions related to basic scientific research that SDSU researchers can use to share their research.

Contact the campus Export Control Officer with questions about export controls and acceptable language regarding export controls in contracts.

- Zena Hovda, Export Control Officer: zhovda@sdsu.edu
- Export Controls at SDSU: http://research.sdsu.edu/research_affairs/export_control

Taxes

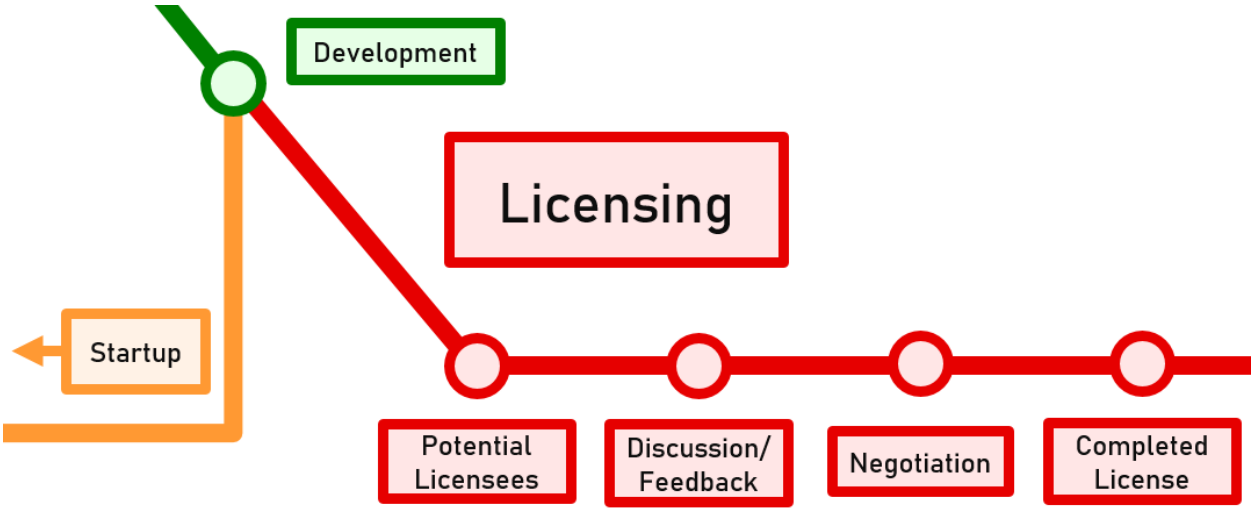
Business owners, managers, and employees are responsible for paying taxes on the income generated by the business or received as compensation for working for the business.

A startup company founder or employee must be responsible for paying taxes and adhering to IRS requirements. The taxes from licensing royalties are generally more straight-forward, as they may be treated purely as personal income.

Tax attorneys and other professionals are helpful in determining when to pay and how much to pay in taxes. Read *Income from Licensing* and *Forming a Startup* for more information on how some of those items can impact the taxes related to income from an idea.

Licensing Intellectual Property

What is licensing and how can it be used to share the idea?



Although it is not exactly a binary choice, most ideas from university settings are commercialized in one of two ways:

1. Licensed to an existing company; or
2. Created as the core idea of a new startup company. Determining which path is more appropriate is one of the most important decisions a creator must make.

If your idea has an intellectual property component that could be licensed, read about *Licensing vs. Forming a Startup,* as well as the rest of this chapter.

If your idea has no IP component and nothing to license, then read about *Forming a Startup.*

If you need to learn more about intellectual property, go back to *Creation & Invention.*

Licensing vs. Forming a Startup

Making the decision whether to license or form a startup may be the most important decision made in the life cycle of an idea. There are pros and cons to each path.

Licensing is only a viable path if there is an intellectual property component to the idea—there has to be something to license—be it a patent, copyright, trademark, or trade secret.

Licensing generally requires less initial work and investment than building a company from scratch. Licensing an invention or creative work to an established company can result in immediate royalties and a long-term royalty stream that requires minimal work from the inventor or creator. Ideas could also be licensed non-exclusively to multiple companies in different fields. However, licensing may not be an appropriate business model for some ideas or technologies.

Forming a startup company is more appropriate than licensing when there is a disruptive technology that the current market is not prepared to serve, or if the idea would threaten the market.

However, forming a startup may take extraordinary time and effort, have a slim probability of success, and require substantial funding to take the idea to maturity or market viability.

There are also hybrid approaches, such as forming a startup around one application and licensing others; forming a startup and sublicensing; and

forming a startup initially and licensing further down the path of commercialization.

Weigh the pros of cons of licensing the idea or starting a company, and make the best educated decision as possible with the information available. The *Development* stage should have provided much of the information necessary to make this decision. Founders whose ideas are affiliated with the University can talk to *the TTO* about which path is more appropriate.

What is a *License?*

A license in the broadest sense is permission to do something. A license to intellectual property is permission to take advantage of the rights associated with that IP. A licensor (such as the IP owner) grants permission to use the IP to the licensee (the party receiving permission to use the IP).

Licenses generally need to be in written, contract form. For software, the terms may be in an end user license agreement (EULA) or a legally binding terms of use (TOU).

Finding a Licensing Partner

It may be easy to find a licensing partner when someone has expressed interest in your technology or creative work, or the underlying intellectual property was developed in tandem with an existing company. But what about when it hasn't?

One way to find a licensing partner is to leverage your existing connections. Do you know someone in charge of licensing or development at an existing company? Is there anyone you have interacted with at a conference or trade show who works with similar technologies? Does your mentor have contacts in an industry relevant to your idea?

If you don't have any existing relationships that can connect you with a licensee, there are other options to license your idea. Consider finding a potential licensee by identifying existing companies working in the same industry as your idea; researching who owns or licenses patents you have seen in a prior art search; or performing market research in an industry where a potential application of your idea may be licensed.

After identifying some potential licensees, consider whether any of your existing relationships have a connection with any of these licensees or if any of them are local to the region. If not, you can try checking if there are licensing or business development individuals at those companies who could review your technology.

Are there *no* licensees for your licensee or creative work? Then perhaps the only way to take your idea forward is to build a company around the idea. Continue to the section on *Forming a Startup* to learn more about creating a company around your idea.

Marketing, Business Development, and Licensing with University IP

One of the benefits of having the core intellectual property owned by SDSU is that owners can take full advantage of the resources of the TTO.

Licensing a university-owned invention or creative work is much more likely to be successful with significant assistance from the inventors or authors, even at the world's most prominent research universities.

If you are an SDSU inventor or author, consider what relationships you already have. Would a research sponsor be interested in what you created under a grant? Are you uniquely connected to companies in your research field due to your interactions with collaborators? Do one of your former research mentors or mentees work for a potential licensing partner? If so, you can connect them with the SDSU TTO or have the SDSU TTO reach out to them to assess their interest in licensing university IP. If there is interest, the TTO can negotiate a license.

In any event, the TTO can help with marketing and business development efforts for a technology or creative work. These efforts can include the following.

- Discussing the market, industry, and applications of a technology or creative work with inventors and authors.
- Evaluating patentability and feasibility of commercialization (see *Evaluation* for more).
- Preparing informational flyers to explain a technology or creative work to companies and potential partners.
- Performing market research related to a technology, industry, creative area.
- Compiling of potential licensees related to a technology or creative work.
- Contacting potential licensees or partners to assess licensing interest, obtain feedback, or develop relationships.

Once a potential licensee has confirmed interest in licensing the inventor's or author's idea, the TTO can negotiate a license to the technology or creative work. That process includes much of the next several sections in *Negotiating a License.*

If you are a student or other founder unable to take advantage of the TTO's services for marketing or business development, you may need to identify potential licensees yourself or hire someone to your startup to help you do so. If so, go to *Marketing & Business Development* in the chapter on *Forming a Startup Company.*

Negotiating a License

Negotiating a license to intellectual property can be a challenging and complex process, depending on the technological or creative area. Negotiations begin with an offer of by one party, followed by a counteroffer and further discussion until a mutually agreed upon set of terms are reached.

There are industry-specific conventions and comparable royalty rates that serve as good starting points for a licensing negotiation. These comparable royalty rates may be found on the internet, in existing publically available licenses, in trade journals, and in existing market conventions.

Terms of a License to Intellectual Property

Exclusivity

The exclusivity of a license for intellectual property may be the most important term in a license to intellectual property. Exclusivity describes whether the permission to use the IP extends only to that party licensing it, or if other parties may obtain permission to use the IP as well.

Exclusive Licenses vs. Non-Exclusive Licenses

An exclusive license is a license in which the licensee is the *only* party who can make use of the invention. This means that the licensor will not grant permission to anyone else to use the IP. Often an exclusive license is very important and valuable, such as with startup companies built around a specific technology.

A non-exclusive license is a license in which the licensor can grant permission to other parties to use the intellectual property. Because the licensee is not the only party who can take a license in a non-exclusive situation, the terms may be much more favorable to the licensee.

A company's entire value proposition may rely on being an exclusive licensee. Because exclusivity can be very valuable, the terms and compensation in an exclusive license could vary greatly from the terms of a non-exclusive license.

However, depending on the party and business opportunity, a non-exclusive license may be unattractive if competitors and other parties can also take a non-exclusive license from the IP owner.

The "Rights"

As explained in *Creation & Invention,* intellectual property is ownership of the set of rights associated with an idea.

A patent grants an owner the right to use, make, sell, offer for sale, and import an invention. A copyright owner holds the right to duplicate (copy), publish, and use the subject creative expression, among other things.

The "rights" section in a license sets out the permissions the licensee receives to the IP. In some cases the licensee will receive all associated rights, while in others (such as a software license)

the permission may be limited to the right to use IP associated with the program.

Options

An option is a contractual period during which the holder can evaluate the IP to determine whether to pursue a more long-term license.

Normally, the party granting the option is not permitted to license the IP while the option holder evaluates the technology or creative work.

Options are often included in sponsored research agreements or other IP agreements to allow a party to decide if they want to license or purchase a technology or creative work while maintaining its availability. An option may include permission to the rights associated with the IP, such as a license to use the IP to test it internally or assess its technical viability.

Field of Use

A field of use is the technical, market, or application area to which the permission in a license is limited.

Often, exclusivity in one field of use will be sufficient for a founder or company's purposes. In such cases, the licensee would be the only party with permission to use the intellectual property in its business area, and thus could maintain its competitive advantage.

For example, a company that produces airplanes may only be interested in licensing a patented manufacturing process for the aerospace field of use, allowing the IP owner to license the technology for production of automobiles to another party.

IP Protection Terms

A license, inter-institutional agreement between joint IP owners, or cooperative research agreement may set out how the parties will navigate the patent prosecution process described in *Creation & Invention.*

For example, the IP protection terms may describe who will file a patent application; how documents will be shared between the parties; and the timeline for providing input on patent decisions, among other things.

Patent Costs

Patent costs are the expenses to apply for, obtain, and maintain patent protection incurred during and after the patent prosecution.

For inventions with pending patent applications, terms for sharing patent costs may be one of the most important items in the license. For an exclusive license, it is typical for a licensor to require the licensee to pay for all the past and ongoing patent costs associated with an invention.

License Duration

The license duration describes the length of time the permission to use the IP lasts. An option with license terms may be as brief as a few months, while an exclusive license may last for the life of a patent or copyright.

Termination

A license will often set out ways to terminate (end) the license before the duration of the license has elapsed, such as in the case of a material breach or bankruptcy. A termination clause will state the mechanism for ending the license (such as how to alert the other party and the timelines), and whether there is a right to fix or cure a breach. A license may be at will, meaning either party can cancel at any time either with or without notice.

Sublicensing

One of the most important terms of a license may be the right to sublicense. Sublicensing is the

ability of a licensee to license the IP further downstream to other parties (called sublicensees).

Many licenses forbid sublicensing, while in others sublicensing is a material term and the licensee's entire business model revolves around being able to sublicense to other parties.

Research License

Research licenses are exemptions to other terms of the agreement that grant special research permission. A research license may apply to either a licensor or a licensee.

For example, a university may retain a license to use a patent or copyright to avoid imperiling their mission to perform research. On the other hand, a licensee may be permitted to use IP for internal research purposes without paying a royalty to the licensor.

License Consideration

The license consideration is the compensation, financial or otherwise, provided by a licensee in exchange for the permission to use the IP in the agreement.

Consideration for a license can be structured in a number of ways. Some of these ways are straightforward (e.g. "5 percent of net sales"), while others are more complex (deferred compensation in the form of a convertible note).

Free and open-source licenses may have no financial terms, but may put limitations on the rights available to the licensee, such as requiring attribution, limiting permission to non-commercial use, or forbidding alterations to the underlying IP in exchange for free use.

Royalties

Royalties is a term encompassing many forms of license consideration, most often a percentage of a measureable factor such as net sales, license revenue, profits, or units sold. Royalties are often the primary form of consideration provided for a license, and paid by a licensee at recurring intervals throughout the life of a license.

License Issuance Fee

A license issuance fee is an initial form of compensation to obtain permission to use IP. License issuance fees can accompany other types of ongoing royalties or license consideration.

Equity

Equity is an ownership stake in a business enterprise, and may be provided in exchange for the permissions in a license.

Equity is a common form of license consideration when a startup company is built around the licensed technology or creative work or has limited upfront capital. In accepting equity instead of other consideration, the licensor takes a risk that the company may fail and never pay royalties for the right to use the IP.

Milestone Payments

Milestone payments are sums provided to a licensor when important events or developmental landmarks occur in the life of the agreement.

Common milestones include net sales targets, an important commercialization or developmental event, and completion of a specific phase of regulatory approval. A bonanza clause is a milestone payment in which the milestone is a lofty, probably unattainable goal that triggers a substantial payment.

Minimum Annual Royalties

A minimum annual royalty is the smallest amount a licensee may pay to maintain a license in a given year.

A licensor will require a licensee to pay a minimum annual royalty even when sales fall below the parties' goals to make the license worthwhile or commercially justifiable. This helps mitigate risk in the event the company is unsuccessful or slower reaching market than anticipated.

Income from Licensing

See *Terms of an IP License* to see how to obtain income from IP licensing.

Licensing can be just as lucrative as creating a company around an idea, or manufacturing and

selling goods based on a piece of IP. Many successful, large companies have business models built on licensing IP. In the software realm, a form of licensing is the most viable or only way to commercialize the idea.

Does a creator or inventor receive income from licensing if the IP is owned by the University?

Yes. If the IP is owned by the University as a product of research, the inventors or authors receive 50 percent of the net royalties received by the Foundation. That 50 percent of royalties is distributed amongst the creators according to a royalty sharing agreement between the creators and the University, usually in proportion to each creator's inventive or creative contribution.

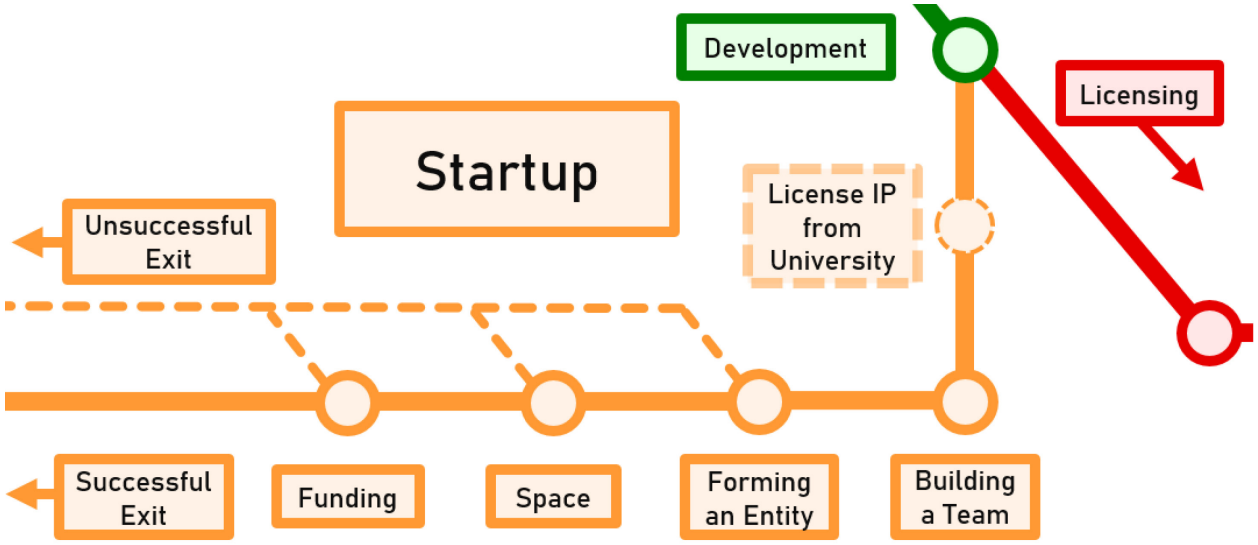
Fifty percent of royalties for creators is a generous portion compared to royalty policies at most public institutions and virtually all private corporations. Furthermore, 25 percent goes to the creators' college and is expected to further their research. Royalties are distributed according to Distribution of Royalty Guidelines developed by the *UCPC,* and administered by the *TTO.*

Do I have to pay taxes on royalties?

Royalties from licensing are treated as personal income for tax purposes. Consult a tax attorney or accounting professional for more help on taxes on royalties.

Forming a Startup

How to create and build a company around the idea?



The previous chapter explained how most ideas are commercialized by either licensing the idea to an existing company, or building a startup company around the idea, and also how to make a decision between *Licensing vs. Forming a Startup.*

If you want to review the advantages and disadvantages of each approach, read about *Licensing vs. Forming a Startup* in the last chapter.

If your idea involves research at SDSU, read about *Licensing IP from the University* in this chapter, or go back to *Creation & Invention* to learn about the basics of *Intellectual Property* or *Evaluating the Idea* to learn about *University Ownership of Intellectual Property.*

If your idea does not involve University research, continue with this chapter to learn about *Building a Team, Forming a Business Entity, Space for a Startup Company, Funding,* and *Exits.*

What is a "startup" anyway?

A startup is any organization trying to turn an idea into a viable business model, usually under conditions of great uncertainty.

Unlike other ideas, small businesses, and entrepreneurial ventures, startups generally require the formation of a formal business entity and an influx of capital to scale up. Founders usually intend to grow their startups into large ventures,

Revisit Licensing vs. Forming a Startup in the last chapter to contrast this path with licensing the idea to a third party, and keep reading this chapter to learn more about just a few of the steps to forming and running a startup company.

Licensing IP from the University

In cases where SDSU owns the IP related to an idea resulting from *Research,* the potential startup company must license the IP to obtain permission to use the idea and build a company around it.

Contact the *TTO* to discuss licensing IP from the SDSU and the potential terms of such a license. While a license to a startup will contain many of the terms discussed in *Licensing Intellectual Property,* a license to a startup will often provide a

small amount of equity to the University because of startup's lack of available capital and the risk taken by the University that the company will not succeed in commercializing the idea.

It makes sense to contact the *TTO* before building a team or forming an entity to verify the availability of the IP for a startup, and discuss potential terms.

Revisit *University Ownership of Intellectual Property* in the chapter on *Evaluating the Idea* to review when SDSU should own the IP associated with the idea.

Business Planning & Lean Startup Methodology

Although there is no one-size-fits-all approach to business planning, the following free resources and affordable books teach the basics of a few business planning methodologies popular in the startup community.

- *The Lean Startup,* by Eric Ries: http://theleanstartup.com/
- Lean LaunchPad master video library: https://venturewell.org/i-corps/llpvideos/
- The Business Model Canvas, by Alex Osterwalder: https://strategyzer.com/canvas/business-model-canvas
- *Value Proposition Design,* by Alex Osterwalder, Yves Pigneur, et al. https://strategyzer.com/books/value-proposition-design

A traditional business plan contains a strategy for how and when the idea will return a profit to investors. Typical contents of a traditional business plan include an executive summary, a mission statement, a description of the product or service offered, a marketing plan, an analysis of the competitive landscape, an operation plan, and financial projections for the company.

Many of the above resources espouse lean startup methodology, a process to build a company by eliminating uncertainty about the idea through quick and continuous building, learning, and testing of the idea in an iterative fashion. The programs at both the *CSU I-Corps Site* and the *ZIP Launchpad* utilize aspects of lean startup methodology.

The Business Model Canvas is a chart that serves as a tool to describe how a company creates, delivers, and captures value. The Business Model Canvas demonstrates the value of the idea through fields such as value propositions, customer relationships, and key resources.

Items like the Business Model Canvas may serve as an alternative to a traditional business model. Investors in innovation sectors such as software and technology may prefer to see a completed Business Model Canvas rather than a traditional business plan when deciding whether to fund an idea—at least in the early stage of a company.

Building a Team

Often, building a strong team around an idea is the most important part of starting a company. In addition to those providing *Mentorship,* a company's team may include a Chief Executive Officer, Chief Financial Officer, Chief Technology Officer, engineers, scientists, developers, marketing or salespeople, advisors, and other employees.

Even startups built around world-changing ideas need skilled and capable managers to bring the idea to market and lead the company to long-term success.

Many investors view the strength of a startup team as the single most important factor in deciding whether to invest in a company. Good science and creativity are not enough to guarantee commercial success. For this reason, it is essential to build a strong business team around your idea.

Help Building a Team

Members of your company team can come from a variety of sources. Often, a mentor found while *Developing the Idea* will mature to a team member as the idea progresses further, or serve as a connection to other prospective team members.

For students starting a company, fellow students can be great sources of inspiration, collaboration, and team membership. The *ZIP Launchpad* can

also provide introductions to potential team members for students participating in its E-Track or Launch Track.

For researchers, team members could come from the PI's laboratory. Doctoral and other graduate students have the technical understanding required to share the idea with others, and often the desire and enthusiasm to help drive the idea forward.

Startups built around SDSU IP can contact the *TTO* for help finding team members. The TTO can leverage its network and relationships with local partners such as *CONNECT* and *Tech Coast Angels* to identify, contact, and facilitate relationships with potential team members. Also, participation in programs like the *CSU I-Corps Site* can lead to interactions with potential advisors and team members.

Other events, partners, and resources in this manual may serve as pathways to meet team members for a startup built around your idea.

Forming a Business Entity

The business entity is the legal form a company takes that permits it to do business with the rest of the world. Formal legal entities often provide limited liability, a limit to personal financial and legal obligations provided in exchange for paying taxes, meeting governmental requirements, and providing the greater economy with jobs, products, and services.

Consult an attorney or other service provider to determine which business entity to form as your startup company, and to help form that business entity. Factors to consider are the limits of liability, the ability to take on funding, and the tax implications of the entity.

Sole Proprietorships

A sole proprietorship is an enterprise operated by one person informally as an individual. A sole proprietorship has none of the legal protections of limited liability available to other entities. For this reason, an entrepreneur may want to consider one of the other following business entities.

Partnerships

A partnership is an association of two or more persons (partners) to carry on as co-owners of an enterprise for profit.

A general partnership exists when parties run a business as co-owners, which may be inferred form the conduct of the parties (such as before a business is formally created). A limited partnership (LP) exists when there is a partnership with at least one limited partner (a co-owner with limited liability).

Generally, LLCs and corporations are more desirable than partnerships because they can provide limited liability to all owners of the enterprise.

LLCs

A limited liability company (LLC) is a hybrid entity between a corporation and a partnership in which the owners have limited liability but are taxed as if income "passed through" to the members as individuals.

To form an LLC, an entity must file articles of organization with the secretary of state of the entity's home state. LLC owners may be classified as "members" (default) or "managers," with differing roles based on who runs the business.

An LLC is desirable for small businesses where the owners want to limit liability and save cost at formation, but are not sensible long-term for businesses that need to raise significant amounts of capital. The formal structure of a corporation is much better for raising the large amounts of money many startup companies need to grow, and changing an LLC to a corporation can be a cumbersome process.

- Tips for filing a Limited Liability Company a California: https://www.sos.ca.gov/business-programs/business-entities/filing-tips/filing-tips-llc/#llc1
- California LLC forms: https://www.sos.ca.gov/business-programs/business-entities/forms/#llc

Corporations

A corporation is a business entity in which the owners — who may be many in number — have

limited liability. Corporations are divided into units called shares. The owners of a corporation are shareholders whose stake depends on the number of shares owned, and participate in the corporation by voting in important decisions and selecting directors.

The board of directors oversees a corporation, while corporate officers manage the day-to-day operations and business activities as delegated by the board of directors.

Close corporations or private companies are corporations owned by a relatively small numbers of shareholders who do not trade shares publicly. On the other hand, publicly-traded companies sell shares openly in markets or on a stock exchange.

To form a corporation, a company must file articles of incorporation with the secretary of state in the entities home state, as well as bylaws setting out the management of the corporation. The articles of incorporation set the authorized shares available for sale, and whether there are different types of shares.

Compared to LLCs and partnerships, there are more legal requirements and procedures that need to be followed by corporations. However, because of the ability to sell shares and reorganize, the corporate structure is necessary to raise the large sums of money needed to grow an enterprise. For that reason, many startups begin as corporations registered in their principal state of business or in Delaware, a state with favorable laws for corporations.

While founder should seek a professional for more information on the tax consequences of different business structures, founders should be aware that corporations may be taxed separately from the owners (a C corporation) or have the taxes pass through to its shareholders like in an *LLC* (an S corporation).

Managing the Business and Scaling Up

The day-to-day activities of running a business can include hiring and firing employees, budgeting, accounting for profits and losses, making payroll, providing employee benefits,

developing products, managing administrative duties, paying taxes, and planning for long-term success.

While these activities may be manageable for a small group of people at the beginning of a startup's life, they grow in complexity as companies produce more revenue, increase output, and hire more people. Managing this process of growth, or scaling up, poses challenges and requires a strong team, so don't hesitate to bring in experienced managers when appropriate.

Common Types of Agreements

There are many common agreements that are necessary to effectively run a business. Some templates are easy to find and adapt, but others may require the help of legal counsel or another service provider.

- Employee Agreement: A contract between an entity and its employees that set out the legal terms of the working relationship, such as compensation, an assignment of IP, a promise to keep proprietary information secret (see *NDA*), and stock options.
- Agreement with Contractor: A contract similar to an *Employee Agreement,* but for independent contractors that are not employees. Terms for assigning IP and clarifying that the contractor is not an employee are vital in such agreements.
- Non-Disclosure Agreement (NDA) or Confidential Disclosure Agreements (CDA): Agreement to not share confidential information, proprietary information, *Trade Secret,* and other potential intellectual property with other

parties. The TTO has signatory authority on NDAs related to University research.
- Lease: Agreement with an incubator or landlord setting out the cost and terms for allowing a company to rent a space.
- Term Sheet: Summary of agreement setting out the terms of an investment from an investor to a startup company.

Space for a Startup Company

Even as much of running, operating, and managing a business has moved to cloud computing, mobile communication devices, and wireless computing, all business entities require a physical presence of some kind.

A business's physical presence may be a simple as a post office box to receive correspondence with the government and an address for an agent to serve with legal documents. More often, companies have needs such as laboratory space with specific capabilities, special equipment, office space for business and administrative activities, meeting space, server space, network capacity, security requirements, and others.

How do I know what kind of space I need for my business?

All founders should evaluate the needs of their business to determine what kind of physical office or laboratory space to pursue. Considerations for space may include the following:

- Is designated Research & Development space necessary? Is a laboratory needed? What unique capabilities are necessary? How many benches for R&D work? Is wet lab space for chemical or biohazards needed? Fume hood? Refrigeration? Hazardous waste disposal? Electrical power requirements?
- What is the level of commercialization support required? Is an incubator or accelerator appropriate? Is a coworking space or traditional office setup sufficient?
- What other types of support does the startup need? Printing? Network capacity? Access to conference rooms?
- Is the network important? Access to other startup companies dealing with similar challenges? Professionals in similar technical or creative areas? A potential network of investors?
- What is the ideal geographical location? Will an undesirable location hinder the startup's ability to recruit employees? Is access to partners important? Is it worth paying substantially more for a desirable location?
- What are the cost constraints? Is the startup willing to relinquish equity for space in a desirable incubator?

What help is there for SDSU students or faculty to find space for a startup?

For SDSU students, enrolling in the *ZIP Launchpad* provides access to the shared space and resources in the *William E. Leonhard Entrepreneurship Center* on the first floor of SDSU's Engineering and Interdisciplinary Sciences (EIS) building, as well as the *H.G. Fenton Company Idea Lab.* ZIP Launchpad participants can access the center by swiping their SDSU Red ID.

SDSU faculty and staff can contact the *SDSU Research Foundation* about obtaining space at one of their facilities on- and off-campus.

Incubators & Accelerators

What is the difference between an incubator and an accelerator? What about coworking spaces?

Definitions of incubators and accelerators vary based on the source, but most sources tend to agree that each has the following attributes. There is often significant overlap between incubators and accelerators, depending on the offerings of each program. For this reason, characterization of an incubator or accelerator can be hazy.

Incubators

- Physical locations and services with square footage, office space, conference rooms, shared equipment, and other support.
- Focused on incubating innovation until ideas are ready to scale or survive on their own.

- No set duration—the relationship may continue indefinitely.

Accelerators

- Programming and curriculum to scale businesses.
- Focused on growth and raising money.
- Set duration (usually 3-to-6 months).

Some accelerators are similar to the programs discussed in the chapters on *Evaluation* and *Development,* so revisit them for more information.

Coworking spaces are traditionally more hands-off than accelerators and provide less designated space for an individual company than an incubator. They are similar to traditional offices, but allow all member startups to make use of the space with a desk, cubicle, or individual office. Coworking spaces usually offer internet, printing, conference space availability, and other support.

Lab Space

One of the most important aspects of forming a startup built around an idea originating from *Research* at SDSU is to distinguish the startup's lab space from a faculty member's lab space on campus.

While a faculty member's lab may be sufficient for furthering intramural research, a startup needs extramural lab space to further proof-of-concept, prototype production, translational research, and IP development while keeping what belongs to the company and what belongs to the university distinct and different. Extramural lab space is essential to maintain the integrity of research at the University and to pass due diligence review by potential investors.

Lab spaces available for startup companies in San Diego available including the following, among others.

- BioLabs: Coworking space for life science startups. https://www.biolabs.io/_documents/BioLabs-San-Diego-Brochure-Web.pdf
- JLABS @ San Diego: Lab space and incubator launched by Johnson & Johnson. https://jlabs.jnjinnovation.com/locations/jlabs-san-diego#paragraph-116

Accelerators

Accelerators and accelerator-like programs in San Diego include the following, among many others.

- Ad Astra: Accelerator focused on women founders. https://adastra.ventures/
- CONNECT Springboard: Business accelerator program built on extensive entrepreneur-in-residence and mentor network that lasts 3-to-6 months. http://www.connect.org/entrepreneur-experience
- Founder Institute: Pre-seed startup accelerator. https://fi.co/s/san_diego
- Hera Hub: Coworking space and business accelerator focused on women entrepreneurs. https://herahub.com/
- San Diego Sport Innovators (SDSI): Mentoring, accelerator programming, and networking for companies in the sports industry. http://www.sdsportinnovators.org/accelerator-program/

Incubators

Incubators in San Diego include the following, among many others.

- ZIP Launchpad Launch Track: SDSU's on-campus incubator with programming to help evaluate or build a company around the idea. Learn more about the ZIP Launchpad throughout this manual, including *"I Have an Idea!"* and *Developing the Idea.*
- EvoNexus: Incubator for technology companies. https://evonexus.org/
- CyberHive: Incubator for cybersecurity and tech startups. http://www.ihive.org/uncategorized/heading-into-monday/

Coworking Spaces

- Deskhub: Coworking space in Little Italy. http://www.deskhub.com/san-diego/
- Downtown Works: Coworking space in downtown San Diego. https://www.downtownworks.com/
- WeWork: Coworking space with locations in both UTC and downtown San Diego. https://www.wework.com/l/san-diego--CA
- Other Coworking Spaces, Incubators, Accelerators, and Shared Office Spaces: http://sdtechscene.org/resources/

Funding

Funding, in the context of this manual, is financial support to help an idea reach the market, reach commercialization, or otherwise achieve success. The term capital is often used interchangeably with funding to denote a company's financial assets, including an investment in a startup company when used in the context of raising money to support the startup.

This chapter focuses on concepts related to funding to support a startup company built around an idea. Many founders taking advantage of this manual may not require external funding.

There is no one path to raising funding for a startup, but most accelerators help founders create a pitch deck of slides to present to potential investors. Some ideas need much more financial support than others. A software app may be able to reach market with only a few thousand dollars of investment, while a life science therapeutic requiring FDA approval may take billions of dollars in funding to reach market.

Evaluate your idea's funding needs, and identify the best path to achieve those funding goals.

Generating Investor Interest

What things do investor look at when deciding whether to invest in an idea or a startup?

Investors look at many factors when deciding whether to invest in an idea or a startup company, but these are some of the most crucial factors:

- What are the team's qualifications? See *Building a Team* for more information.
- What is the size of the market opportunity and potential to reach customers? See *ZIP Launchpad E-Track* and the *CSU I-Corps Site.*
- Revenue: is there any and how much is it?
- Is there demonstrated growth or the prospect of future growth for the company?
- Innovation: how creative, revolutionary, or disruptive is the technology or creative idea?
- Is there a clear path to the market?
- Is the idea in an industry the investor or fund focuses on?
- Has the startup already raised funding, in particular non-dilutive funding? See *Traditional Grant Funding* and the *SBIR & STTR Programs* for more information.

Funding Stage vs. Funding Form

When discussing funding in a startup company, there are two primary things to discuss with each investment: the stage of funding and the form of funding.

For example, an award from one of the *SBIR & STTR Programs* from the Department of Energy is early-stage funding in the form of a non-dilutive grant. On the other hand, a Series C round in the form of a venture capital investment is going to require equity in the company and dilute the founders' share.

Forms of Funding

Non-Dilutive vs. Dilutive Funding

All the forms of funding are classifiable as either non-dilutive or dilutive. Non-dilutive funding is an influx of money that does not lessen the percentage stake of the company's current owners. Dilutive funding, on the other hand, is capital that may be necessary to help a company grow but comes at the cost of reducing the percentage of the company held by the current owners.

While startup companies that need to grow substantially or raise vast sums of money nearly all need dilutive funding at some point, non-dilutive funding — especially for a young company — can be doubly valuable by furthering the idea while preserving the owners' current share in a company. Non-dilutive funding may also come with fewer sacrifices regarding management, and thus is desirable when moderate sums of money will suffice.

Traditional Grant Funding

While normally several steps removed from commercialization, basic research funding provides the foundation for the inventions and creative works of the future. Thus, traditional grant funding for an idea is the first investment made in a company, and a valuable asset. See the *Research* chapter for more information on finding and winning traditional grant funding.

Beyond funding for basic research, there are many grants and programs that focused on translational research and small businesses. Increasing numbers of federal programs have commercial objectives that provide funding without diluting the value of an idea or startup. Some of those opportunities, such as the *SBIR & STTR Programs,* are described in greater detail in the following sections.

Crowdfunding

Crowdfunding is the practice of funding a project or venture by raising small amounts of money from a large number of people, typically via an internet platform dedicated to that purpose.

In exchange for a crowdfunding contribution, entrepreneurs often provide contributors a special benefit depending on the amount provided: such as earlier access to the eventual product, unique features, or special recognition. The terms of crowdfunding can be favorable for entrepreneurs in exchange for sharing a percentage of the money raised with the crowdfunding platform.

Each crowdfunding platform has its own benefits, drawbacks, mission, and typically supported projects. Popular crowdfunding platforms include:

- Kickstarter: https://www.kickstarter.com/
- GoFundMe: https://www.gofundme.com/
- Indiegogo: https://www.indiegogo.com/

Equity

As discussed in the *Licensing* chapter, equity is simply an ownership stake in a business enterprise. In addition to a form of consideration in license agreements, providing equity to an investor is usually implicit in substantial investments.

While startup founders would like to maintain their ownership share and thus their percentage of the value of the company, relinquishing some percentage of equity is necessary to raise the large sums of money often required to grow a startup.

The percentage of ownership obtained by an investor depends on the amount invested and the value of the company at the time of the investment. A valuation refers to the monetary worth at which a company is apprised, and can be done using a variety of approaches. A valuation occurs at the time of every significant investment.

Debt

Debt is merely borrowed money expected to be repaid in the future (with interest). Borrowing money (taking on debt) is one way to satisfy capital requirements without relinquishing ownership in a company. Debt may come in the form of a promissory note (basically an I.O.U.), or another instrument.

However, because startup companies usually have no revenue and limited assets to serve as collateral, they are viewed as poor credit risks and loans are unavailable or carry significant interest rates. Although exceptions exist, debt is seldom a

realistic long-term financing tool for startup companies.

Convertible Notes

A convertible note is a form of short-term debt that converts into equity, typically in conjunction with a future financing round. In effect, the investor loans money to the startup and instead of a return in the form of principal plus interest, the investor receives future equity in the company.

The primary advantage of issuing convertible notes is that it does not prematurely force the issuer and investors to determine the value of the company when there are not many activities or assets on which to base a valuation—the company may still be primarily an idea.

The valuation for converting a note will occur in later funding rounds, when there is more data off which to base a valuation.

Stages of Funding

Proof-of-Concept Funding

Proof-of-concept funding describes monetary support to verify an idea. Unlike traditional research, the idea is beyond the hypothesis stage, and the inventor or creator needs funding to develop a prototype, create a beta program, or demonstrate the idea's viability.

Proof-of-concept funds are usually modest investments ($50,000 or less) meant to take an innovative idea to a fundable concept. There is a lack of available proof-of-concept funds for ideas originating at universities, so many universities have created their own proof-of-concept funds.

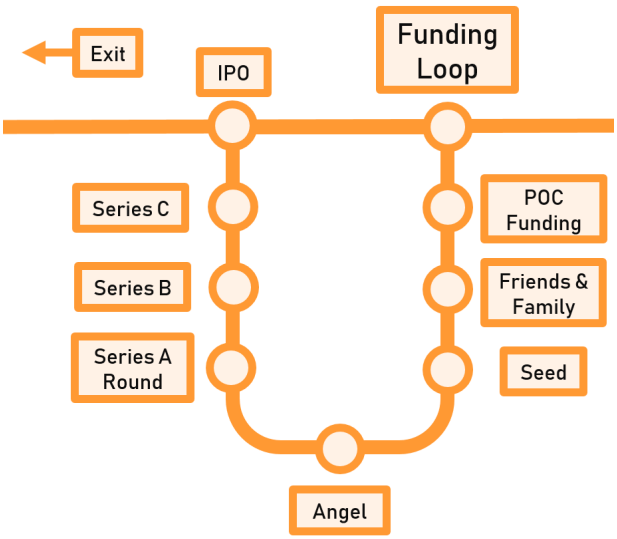
Friends & Family Funding

Many first investments come in the form of friends and family funding: pre-seed monetary investments from those the entrepreneur knows personally and who are willing to take a chance on the entrepreneur's business idea.

While friends and family funding may be the only source of capital available to get a company up and running on favorable terms, funding from friends and family comes with the risk of straining those important relationships.

An entrepreneur must be forthcoming and honest with friends and family about the risks of investing in the founder's company. The company founder should explain the business plan that the money will help fund, and put the investment and its terms in writing. Friends and family often comes in the form of debt or a convertible note.

Seed Funding



Seed funding is an investment occurring at an early stage meant to help "start" a company, for all intents and purposes. The intent of seed funding is to support the startup until it can generate revenue or attract further investment.

Most seed funding requires some equity in exchange for the investment. The "seed round" may overlap or be an alternative to crowdfunding, friends and family funding, and angel funding.

Angel Funding

Angel funding is financial support from an affluent individual who provides capital in exchange for a convertible note or ownership equity in a startup company.

Angel funds—pools of money created by a group of angel investors who invest together—and super-angels—individuals who invest $250,000 to more than $1 million in a single deal—are

increasingly common in regions with significant startup and investment activity.

See *Help Finding Funding* for information on potential investors such as *Tech Coast Angels* and other funding resources.

Venture Capital Funding

Venture Capital (or VC) financing is a large private investment for equity that is provided by firms or funds to small, emerging companies that are deemed to have high growth or potential for a significant return on investment (ROI). Growth is measured using the number of employees, revenue, market share, or some other measure.

Venture capitalists take on the risk of financing risky startups in the hopes that some of the firms they support will become largely successful. While normally large investments, VC financing usually comes at the cost of a large ownership share or control of the company.

VC investors often seek stock with certain benefits called preferred stock. Multiple rounds of VC financing may be needed before a company can go public in an initial public offering (IPO), and these rounds are normally labeled the Series A, Series B, Series C, and even Series D rounds based on the series of stock after common stock.

NSF I-Corps

The *CSU I-Corps Site* provides microgrants exceeding $1,000 in funding to help scientists leave the lab to interview customers and demonstrate that the idea solves a fundable problem. The subsequent national NSF I-Corps Node Program provides $50,000 to further verify the idea.

The funds available through NSF I-Corps can operate as *Proof-of-Concept Funding.* Read more about these programs and funds they provide in the section on the *CSU I-Corps Site.*

The SBIR & STTR Programs

What are the SBIR & STTR Programs?

The Small Business Innovation and Research (SBIR) and Small Business Technology Transfer (STTR) programs provide competitive federal awards focused on the commercialization of technology to small businesses and research institutions. There are several participating federal R&D agencies associated with each program.

The SBIR and STTR programs tout themselves as "America's Largest Seed Fund" and have the following goals:

1. Stimulate innovation in technology;
2. Facilitate technology transfer of inventions produced through federal funding;
3. Foster collaboration between small businesses and research institutions.

Both programs are administered in phases.

- Phase I-Feasibility & Proof-of-Concept: Awards normally do not exceed $150,000 in total costs over six months (SBIR) or one year (STTR).
- Phase II-Research/ Research & Development: Awards normally do not exceed $1 million in total costs over two years.
- Phase III-Commercialization: Continued development with third-party funding, aided by advantages for Phase I & II recipients.

How are the SBIR and STTR programs different?

The SBIR and STTR programs are similar and have complementary objectives, but differ in where the work occurs and where the PI may be employed.

The SBIR program is a competitive program that encourages domestic small businesses to engage in federal R&D that has the potential for commercialization. The SBIR program permits and encourages research partnerships, but the majority of the work must be completed by an incorporated small business entity. The research institution can complete up to 33 percent of the total effort for a Phase I award, and up to 50 percent of the total effort for a Phase II award.

Also, the PI in an SBIR award must be primarily employed (spend more than 50 percent of his or

her work time) with the small business at the time of award and for the duration of the project.

The STTR program requires that the small business formally collaborate with a non-profit research institution. The small business must perform at least 40 percent of the work and the research institution must perform at least 30 percent. The remaining 30 percent of the work may be distributed to either party or an additional third party.

In the STTR program, the PI may be primarily employed by either the small business or the collaborating non-profit research institution.

Tips for writing a good SBIR/STTR proposal include the following.

- Choose the topic and agency wisely.
- Select an appropriate topic.
- Select a competitive team.
- Convey big ideas.
- Think like a reviewer.

Read about grant funding in the *Research* chapter. To learn more about SBIR/STTR opportunities and pursuing funding for translational research, contact *Research Advancement* or visit the following links.

- About the SBIR Program: https://www.sbir.gov/about/about-sbir
- About the STTR Program: https://www.sbir.gov/about/about-sttr
- National Science Foundation (NSF) Specifics: https://seedfund.nsf.gov/
- National Institutes of Health (NIH) Specifics: https://sbir.nih.gov/
- Departments of Energy (DOE) Specifics: https://science.energy.gov/sbir/
- The SBIR/STTR Road Tour: http://www.sbirroadtour.com/dates.php

How does my small business work with the University on R&D under an SBIR or STTR award?

Small businesses working with SDSU as the research institution under an SBIR/STTR award subcontract work under the award to the university.

Generally, the small business receiving an SBIR/STTR award may own the resulting IP it and its employees develop, including patents. However, if subcontracting with the University, the terms of federal awards require that the University retain IP rights in inventions and creative works the University develops.

The TTO negotiates IP terms under all sponsored research awards, including SBIR/STTR awards. Read more about receiving and managing awards generally, as well as whom to contact, in *Receiving, Finalizing, and Managing Research Awards* in *Research.*

See *Conflicts of Interest* for more information on how to handle conflicts of interest related to small businesses and other companies.

Help Finding Funding for SDSU Students & Entrepreneurs

Research Funding & Other Non-Dilutive Funding

As explained earlier in this chapter, traditional grant funding is often the first investment in an idea. Revisit the *Research* chapter and talk to *Research Advancement* for help finding non-dilutive funding opportunities that can be used to help forward you idea.

Funding from the ZIP Launchpad & Lavin Center

The Lavin Entrepreneurship Center Startup Fund is a supply of money to create viable companies founded by SDSU student entrepreneurs. The program provides funds for students experimenting with a startup company or commercializing an idea. Purposes for awards from the Lavin Startup Fund may include prototyping, web or app development, brand marketing, legal services, travel for competitions and trade shows, and other commercialization activities.

The ZIP Launchpad can connect teams to different awards from $200 to $5,000 to build a prototype or grow their startup. Teams in the *ZIP Launchpad Launch Tracks* may apply for up to $5,000 from the Zahn Success Fund.

- Lavin Entrepreneurship Center Startup Fund: http://lavincenter.sdsu.edu/programs/start-up-fund/
- Lavin Early Seed Startup Fund: https://www.f6s.com/sdsuentrepreneurshipcenterfunds2019/apply
- All Funding Opportunities through the ZIP Launchpad: https://ziplaunchpad.sdsu.edu/funding
- ZIP Launchpad Prototyping Fund: https://ziplaunchpad.sdsu.edu/funding
- Zahn Success Fund: https://www.f6s.com/ziplaunchpadsuccessfund/apply
- Aztec Cooperative Fund: https://www.f6s.com/azteccooperativefund/apply
- Prebys Entrepreneurship Endowed Scholarship: https://studentaffairs.sdsu.edu/faodad/webss$getScholarshipDetail?p_account_no=A21946&p_ss_year=2019&p_req_id=1

Funding Help from the TTO

The TTO can help startup companies built around intellectual property owned by SDSU find funding opportunities by leveraging its network of contacts, working with community partners such as *CONNECT* and *Tech Coast Angels,* and helping founders prepare to pitch in front of experienced investors at events such as the *San Diego Innovation Showcase.*

Other Funding Resources & Partners

- San Diego Venture Group (SDVG): Organization providing networking and events to further San Diego as a region for entrepreneurship and venture funding. Merged with CONNECT in 2019. https://sdvg.org/about-sdvg/
- Tech Coast Angels (TCA): Network of investors funding startup companies throughout Southern California. https://www.techcoastangels.com/
- CONNECT: Network of experienced entrepreneurs and inventors with its Springboard accelerator programming and events. Merged with San Diego Venture Group in 2019. https://www.connect.org/events

Company Exit

Eventually, in one way or another, a founder or investor is going to have to exit a venture: to leave the startup company, such as through the sale of all remaining equity.

When the price of an exit is significantly higher than it was when the founder started or the investor invested in the company, this is known as a successful exit. Other times, when the startup built around the idea has lost value or the company has simply run out of funding, the exit is less successful.

But successful ideas are not measured by their financial value alone. Some of the most innovative and disruptive ideas changed the world without resulting in financial gains, or before or long after the founder exited the company. Eventually another great idea may come along—and then it's time to go back to Chapter 1 and start a new journey with an idea all over again.

Other Organizations, Resources & Service Providers in San Diego

- Biocom: Organization "to drive public policy, build an enviable network of industry leaders, create access to capital, introduce cutting-edge workforce development and STEM education programs, and create robust value-driven purchasing programs."
  https://www.biocom.org/s/about-biocom

- CleanTech San Diego: "San Diego Regional Energy Innovation Network (SDREIN) is a free program for startups that are developing solutions to help California meet its energy goals."
  http://cleantechsandiego.org/sdrein/

- Co-Merge Workplace: Coworking space in Downtown San Diego.
  https://www.desktimeapp.com/405-co-merge-workplace

- CONNECT: Partner with Springboard accelerator program, extensive mentor and entrepreneurship-in-residence network, coworking space, and educational events for founders.
  https://www.connect.org/

- Entrepreneurs' Organization (EO) San Diego: Global network of business owners to help other entrepreneurs.
  https://www.eonetwork.org/sandiego/.

- Hatch: Magazine and weekly newsletter about innovation activity in San Diego.
  http://www.hatch-mag.com/

- I2020: Accelerator for drug discovery platforms and other therapeutic candidates.
  https://www.i2020accelerator.com/

- JLABS @ San Diego: Lab space and incubator launched by Johnson & Johnson.
  https://jlabs.jnjinnovation.com/locations/jlabs-san-diego

- Lab Fellows: Lab management solutions for compliance, inventory, and procurement.
  https://www.labfellows.com/solutions

- LaunchBio: A nonprofit organization that counsels, identifies, and supports life science and biotech startup companies.
  https://launchbio.org/about

- MetroConnect: A program from World Trade Center San Diego to help small- and medium-sized companies engage with international markets.
  https://www.sandiegobusiness.org/wtcsd/metroconnect/

- Mission Edge: Provides operational services and fiscal sponsorship to social interest organizations.

    - Home: https://www.missionedge.org/

- MIT Enterprise Forum: Local chapter of Massachusetts Institute of Technology (MIT) Alumni Association organization producing "events, activities, and workshops annually to inform,

connect, coach and inspire technology entrepreneurs, business leaders and enthusiasts." http://mitefsd.org/about/

- New Media Rights: Non-profit organization in San Diego providing free and low-cost legal services, educational resources, and public policy advocacy for creators, entrepreneurs, and internet users.
    - Home: https://www.newmediarights.org/
    - Legal Guide for Small Businesses and Creative Professionals: https://www.newmediarights.org/book
    - Legal How-To Guides: https://www.newmediarights.org/legal_how_to_guides_for_citizen_media_creators_online_publishing
- San Diego & Imperial Valley Small Business Development Center (SBDC): Network to provide no-cost and low-cost consulting and events to small businesses and entrepreneurs. https://www.sdivsbdc.org/about-us/
- San Diego Biotechnology Network (SDBN): Organization "addressing the need for more high quality, face to face networking among Biotech professionals in the greater San Diego area." https://sdbn.org/about/
- San Diego Entrepreneurs Exchange: A "nonprofit 501(c)(3) organization run by local entrepreneurs for entrepreneurs and pre-entrepreneurs interested in life sciences, biotech, pharma, medical devices, tech and alternative energy." http://www.sdentrepreneurs.org/
- San Diego Innovation Council (SDIC): Organization convening "the region's premier research institutions to promote a shared vision for growth through innovation, entrepreneurial activities, and education." SDIC's Innovation Showcase in October is a prime opportunity for researchers at the pre-company phase to present their technology to investors and potential partners. http://sandiegoinnovationcouncil.org/
- San Diego Public Library (SDPL): 35 branches that provide spaces, resources, tools, and programs to help make an idea a reality. https://www.sandiego.gov/public-library/about-the-library
- San Diego Regional Economic Development Corporation (EDC): Nonprofit providing services to local companies to accelerate growth. http://www.sandiegobusiness.org/services/helpingcompanies
- SDSU TTO: Office commercializing inventions and creative works produced on the SDSU campus through research.
    - TTO Home: http://research.sdsu.edu/tto
    - Path to Commercialization: http://research.sdsu.edu/tto/path-to-commercialization
    - Background on IP: http://research.sdsu.edu/tto/background-ip-law
    - Disclose an Invention or Creative Work: https://west.inteum.com/sdsu/inventorportal/login.aspx

- ScaleMatrix Launch Center: Accelerator and coworking space for life science and tech businesses.
  https://www.scalematrix.com/launchcenter
    - Social Enterprise Accelerator and Impact Lab (SAIL):
      https://www.missionedge.org/labs/
- Startup Leadership Program San Diego: Fellowship to mentor startup entrepreneurs on how to launch, grow, and scale a company.
  http://www.slpsandiego.com/
- Startup San Diego: Network of founders, innovators, mentors, investors, and students responsible for San Diego Startup Week (SDSW) and other events throughout the year.
    - About: https://startupsd.org/
    - Events: https://startupsd.org/events/
    - Resources: https://startupsd.org/resources/
- Torrey Pines Investment: A life science investment fund based in San Diego.
  http://www.torreypinesinv.com/AboutUs.htm
- UCSD Office of Innovation & Commercialization (OIC): Office to commercialize inventions and creative works originating from UCSD.
  http://innovation.ucsd.edu/
- Union Cowork: Coworking company with access to several locations throughout San Diego.
  https://unioncowork.com/
- ZIP Lauchpad: Incubator with programming for student, faculty, and student startup entrepreneurs.
  http://ziplaunchpad.sdsu.edu/

More Resources for Founders on the Web or Outside the Region

- Cooley GO: Online repository and generator of important legal documents.
  https://www.cooleygo.com/documents/
- Creative Commons: Provider of standardized and easy-to-use copyright licenses and search engine for other works under a Creative Commons license.
  https://creativecommons.org/
- Lean LaunchPad® Master Video Library:
  https://venturewell.org/i-corps/llpvideos/
- Steve Blank, Blog, Slides, and Videos: https://steveblank.com/slides/.

- Talking to Humans, by Giff Constable et al: Book to assist founders with customary discovery and learning how to better understand their customers. https://s3.amazonaws.com/TalkingtoHumans/Talking+to+Humans.pdf

- The Business Model Canvas & Other Resources: https://strategyzer.com/canvas/business-model-canvas

- U.S. Food & Drug Administration, FDA Learning Portal for Students, Academia, and Industry: https://www.fda.gov/Training/learningportal/default.htm

- Udacity "How to Build a Startup: The Lean Launchpad": https://www.udacity.com/course/how-to-build-a-startup--ep245

- Univ. of Michigan, Engineering, Videos on Intellectual Property: Source of videos introducing the basics of patents, copyrights, trademarks, and trade secrets. http://keeplearning.engin.umich.edu/intellectual-property/all-videos/

SAN DIEGO STATE UNIVERSITY

FROM THE SDSU ENTREPRENEURIAL EXPERIENCES WORKING GROUP

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