The background of the cover is a dense, abstract pattern of bright green lines radiating from a central point, resembling fiber optic cables or a complex network. The lines vary in length and thickness, creating a sense of depth and movement.

CSU STARTUP COMPANY PRIMER

v.3.7

INNOVATION • INVENTION • IMPACT



Colorado State University



OVERVIEW

The objective of this primer is to provide useful information to you (faculty, staff, students or entrepreneurs) about commercializing Colorado State University (CSU) derived innovations. Commercialization is a general term used to describe the process by which innovations are developed into products or services, and are sold into the public markets. Within research universities this is most often accomplished by licensing the innovation to a startup company or to an existing corporation. The licensing transaction involves understanding, valuing and describing the innovation and associated intellectual property and knowhow so that it can be legally defined and made available to a commercial entity, and is generally referred to as ‘technology transfer.’ At CSU, technology transfer is done by CSU Ventures (CSUV) acting on behalf of CSU to promote innovation, research, industry partnering, and entrepreneurship through engagement of the CSU community, and to translate the creative works of faculty and staff into meaningful products and services that benefit the university, State of Colorado, and society. CSU Ventures is a 501(c)3 not-for-profit corporation that was formed in 2006 as a subsidiary of the Colorado State Research Foundation (CSURF).

It is important to keep in mind that the fundamental purpose guiding university technology transfer offices across the country is to ensure that state and federally funded research outcomes serve the public interest. While seeking to maximize the financial value of university-created intellectual property and innovations is expected, an overarching goal is making the world a better place by providing avenues for research discoveries to achieve societal impact, which most often happens through creation of products or services made available to the public by commercial entities. For CSU, it is important that the technology transfer objectives be aligned with the research, education and service missions of a land-grant university, and build on CSU’s 2016 designation by the Association of Public Land Grant Universities (APLU) as an Innovation and Economic Prosperity University (IEP). Startup companies based on CSU-licensed technology are an important contributor to economic development through job creation, and have many other benefits that enhance CSU’s reputation and student opportunities.

Because of the nature of federally funded research, many university startups are technology focused and thus much of this document addresses startup elements more particular to what are often referred to as ‘tech’ companies. If your product or service – the thing sold to someone – consists of applied scientific knowledge it most likely falls within the generally accepted definition of a tech company. That said, we don’t make a value judgment related to LAUNCHPAD support of a new startup company idea based on whether it is or is not a tech company. We work with all kinds of innovations. Recent examples are The Fairs App which markets an easy-to-use career fair mobile app built by non-faculty staff in CSU’s Career Center, and Sahti which markets dog food based on nutritional research at CSU. We also support both for-profit and not-for-profit startups.

This primer will walk you through the technology transfer process and terminology used by CSUV. It highlights the role of CSUV’s LAUNCHPAD which provides structured support and resources to prepare for the decision to form a startup based on your innovation and to assist the company as it moves forward to develop and commercialize its products or services.

We look forward to partnering with you to do great things that will benefit society, enhance CSU’s reputation as a research university, and give you career fulfillment.

TECHNOLOGY COMMERCIALIZATION AT COLORADO STATE UNIVERSITY

The starting point is your idea, discovery, or innovation. Most likely it is the result of your CSU employment and the research you are doing at CSU. As a CSU employee, you are obligated to disclose all “works” that may be eligible for protection and have apparent commercial application, as soon as possible, and prior to any form of public disclosure, e.g. podium or poster presentations, publications, or other unprotected communications. These creative works are owned by the university (with a few exceptions like textbooks), whether patentable or not. (The Academic Faculty and Administrative Professional Manual, especially Section J – pages 208ff, provides details on your obligations and rights related to creative works, and you may consult your College’s Research Dean or CSUV staff if you are not sure what might be covered or not.) The web link below connects you to the Professional Manual. www.webcms.colostate.edu/facultycouncil/media/sites/43/2015/03/colorado-state-faculty-admin-pro-manual.pdf.

Possible works, ideas and innovations that should be disclosed are anything defined as:

Novel – new and never before used or disclosed by others

Useful – there is a purpose or intended use known (there may also be others yet unknown)

Non-obvious to someone ‘skilled in the art’ – peers in the field would not readily identify the improvement, innovation, or new application/use

For most creative works to have commercial value, they must be protected in a way that provides appropriate incentives to invest in the innovation and expend the significant time and resources required to develop the associated commercial products or services. The benefits of protecting and licensing works and innovations include, but are not limited to:

- Resulting improvements in quality of life for individuals or industrial efficiency
- Local or regional economic development, e.g. job creation
- Earning royalty income and equity value for innovators, investors, and the university

- Attracting industry sponsored research
- Recruiting and retaining faculty and students
- Providing learning opportunities to graduate students and postdoctoral fellows

The World Intellectual Property Organization defines intellectual property (IP) as creations of the mind: inventions, literary and artistic works, and symbols, names, images, and designs used in commerce. There are different types of IP protection:



KROMATID (WWW.KROMATID.COM) PROVIDES GENOMIC STRUCTURE SOLUTIONS TO GENE EDITING, ONCOLOGY AND RARE DISEASE MARKETS USING ITS PROPRIETARY DGH™ PLATFORM.

Patents: A patent is an IP right granted by governments to inventors ‘to exclude others from making, using, offering for sale, or selling the invention’ throughout the country or territory where granted for a limited time in exchange for public disclosure of the patent application. In the US patent exclusivity is defined as 20 years from the filing date. In the US, and in most countries, there are three types of patents:

Utility Patent: granted to anyone who invents, discovers or improves any new and useful process, machine, article of manufacture or composition of matter, or any new and useful improvement thereof;

Design Patent: granted to anyone who invents a new, original, or ornamental design for an article of manufacture;

Plant Patent: granted to anyone who invents or otherwise produces any distinct and new variety of plant, often called a cultivar.



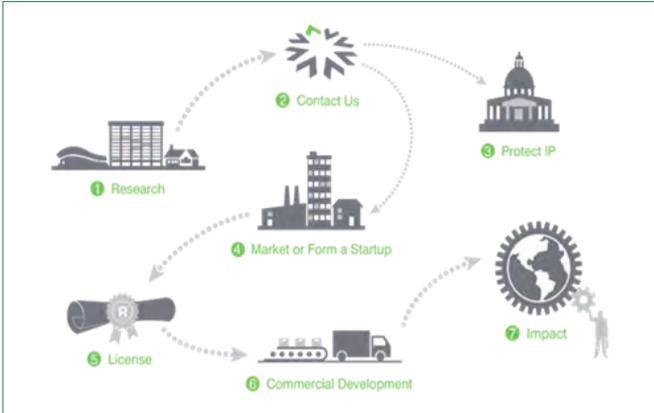
VETDC (WWW.VET-DC.COM) LAUNCHED THE FIRST EVER FDA-CVM APPROVED DRUG FOR TREATMENT OF CANINE LYMPHOMA IN 2017.

Copyright: protects works of authorship, such as writings, music, video games, and other works of art that have been tangibly expressed. The US Library of Congress registers copyrights in the US which last for the life of the author plus 70 years.

Trademark: protects words, names, symbols, sounds, or colors that distinguish goods and services from those manufactured or sold by others and to distinguish products from their competitors (e.g. iPhone®). Unlike patents, trademarks can be renewed forever if they are being used in commerce.

Knowhow (or trade secret): refers to detailed practical knowledge required to create a product or service which may not be patentable but may be critical to successfully manufacturing the product or delivering the service being commercialized. Often, knowhow links directly to knowledge gained in conducting the research that resulted in the innovation being commercialized, and is essential knowledge that has not been shared publicly or is confidentially understood only by the innovator. Knowhow is often considered the most valuable kind of IP because it may have an indefinite life if held as a trade secret. (Patent applications are published and a patent must be reducible to practice by others to be valid so if a derived product has value it is certain that others will use the patent to make and sell their own version of the derived product as soon as the patent expires, e.g. generic drugs.) More generally, if a commercialized product utilizes knowledge gained from CSU research we would consider it know-how that would be licensed to pursue commercialization of the know-how-delivered products.

Prior to passage of the Bayh-Dole Act (c. 1980) most patents resulting from use of Federal funds were assigned to the government, and it may not be surprising that the government was not able to fully realize the commercial potential of innovations, or invest in the development required to bring products or services to market. Prior to Bayh-Dole, the US government had accumulated more than 28,000 patents but fewer than 5% had been licensed to industry. Bayh-Dole fundamentally changed the way America develops innovations, enabling small businesses and non-profit organizations, including universities, to retain ownership of discoveries made under federally funded research programs. Because of the importance of Bayh-Dole to American competitiveness, there are Federal reporting and licensing requirements which CSUV manages to insure CSU maintains ownership rights to the creative output of its employees, and makes those rights available through licensing to private entities.



Unless a researcher discloses and protects their innovation, their work rarely makes it to market where it can have societal impact. CSUV works with many CSU employees each year to help them protect and license their innovations. CSUV has field-specific and experienced licensing professionals to provide individualized support and leadership in the process of protecting and moving your innovation to market. (To illustrate both the process and the considerable experience CSUV offers CSU innovators see the above diagram of the technology transfer process, and the table below of CSUV metrics reported to the Association of University Technology Managers - AUTM - <http://www.autm.net>). AUTM is also a benchmarking resource for CSUV to assure it is following best practices related to licensing university technology and university startup formation.

TEN YEARS OF TECHNOLOGY TRANSFER RESULTS FOR CSU VENTURES				
	<i>FY2016</i>	<i>1997 to 2007</i>	<i>2007 to 2016</i>	<i>change</i>
Invention Disclosures	105	426	1064	150%
Patent Applications	149	529	1381	161%
License Agreements	46	124	369	198%
License Revenue	\$2.4M	\$8.3M	\$18.9M	127%
Startups	5	18	49	172%

FIRST STEPS

Disclosure of an Innovation or Invention

We want to hear about research discoveries that may represent innovations with commercialization potential as soon as possible. You can do this by contacting CSU Ventures directly or by submitting your disclosure online (www.csuventures.org/for-csu-innovators/processes/submitting-an-innovation). A Licensing Director will be assigned to contact you to discuss the disclosure and make sure we understand the innovation and possible linkages to co-innovators within or outside of CSU. We may want to determine if a confidentiality or non-disclosure agreement (CDA or NDA) should be executed to protect conversations you may be planning with academic colleagues or individuals from industry, or if you plan a public disclosure (e.g. a conference presentation, seminar, or journal publication) which may necessitate an expedited patent filing. We are sensitive to career and academic enterprise needs for public disclosure, and will work closely with you to be sure they are not unnecessarily compromised. Additionally, you may wish to share materials (e.g. biological reagents) linked to your innovation with research collaborators. This transfer of material should be covered by a Material Transfer Agreement (MTA). The MTA or NDA/CDA will involve CSU's Office of Sponsored Research but a good starting point is CSUV where we can help navigate the situation and be sure your innovations are protected.

Once disclosed, CSUV staff will begin to research the patentability and commercial potential of your innovation to determine the best course of action.

IP Protection

CSUV has relationships with many patent attorneys who have technology-specific expertise. We will work with you to identify the best fit for your innovation. In many cases, an expedient 'provisional patent application' is filed with the United States Patent and Trademark Office (USPTO – www.uspto.gov) knowing there is often need for additional data or information before filing a full patent application. A provisional application is often useful to establish the 'priority' date on the invention, and to allow public disclosure. It is not examined by the USPTO.

The patenting process is complex, lengthy, and expensive (see Appendix A). The value of a patent is highly dependent on the strength of its individual claims, and understanding the likely value of issued claims is an essential factor in making decisions to protect an innovation and in determining the potential commercial value. For a startup company financing the research required to support patent claims and the legal expense of preparing and prosecuting patent applications is often a substantial burden. Just having an issued patent is not necessarily useful or worth the cost.

CSUV will typically pay for the initial patent filing costs (pre-license), and record those payments as a recoupable expense against disbursements made following receipt of income from the license of the innovation to a commercial entity. Once licensed, patent costs are the responsibility of the licensee. For startup companies, CSUV will continue to pay patent filing costs for provisional and non-provisional applications for the startup for up to 2 years. CSUV does not cover prosecution and filing costs on foreign filings. If patent filing costs become significant, CSUV may choose to recognize this company debt as a loan that is convertible to equity when the startup reaches a specific financing milestone, or upon other mutually defined terms. In the startup world, this 'convertible note' mechanism is generally considered 'friendly' to future investors and the startup company, because it is a tangible demonstration of CSUV's appreciation of the discovery's inherent commercial value.

NEXT STEPS

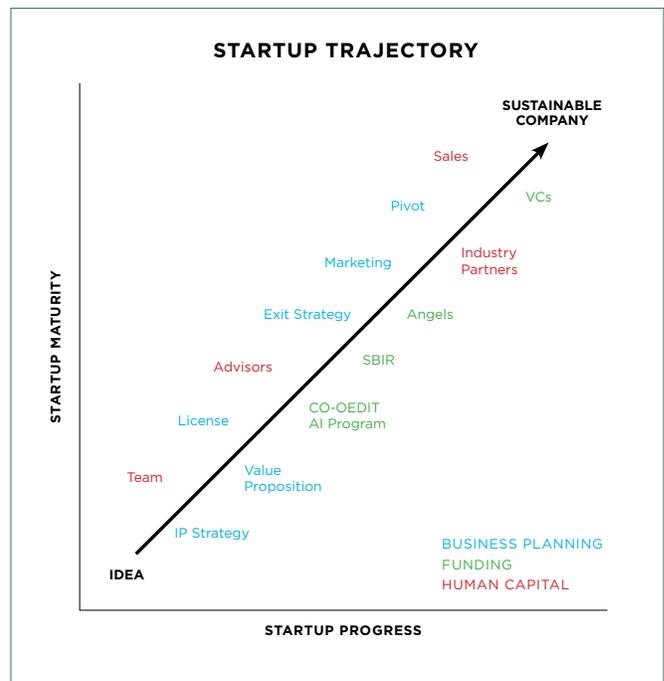
Licensing – Startup vs. Existing Company

CSUV manages ownership rights of your innovation for CSU. A license to your innovation grants the licensee the right (usually exclusive) to use the innovation for specified commercial purposes. Most often, it is best to license to an established company with resources to invest in product development and commercialization, and CSUV's Licensing Directors are prepared to work with you to identify optimal licensee companies.

However, if your innovation requires substantial proof of concept or product validation prior to achieving the maturation necessary to make it attractive to industry, it may be a good strategy to license the innovation to a newly created company (startup or newco) in which you would then be a 'founder'. Another reason to consider a startup is if your innovation represents a 'platform' technology, i.e., there are many potential applications (products or services) that could be derived from the protected innovation and its derivatives, and maximal value may be realized by having a startup pursue several of those applications to a more advanced proof of concept stage. At that time, allowing an existing company to acquire the improved assets may be more financially rewarding to the company (and its founders) than would have been achieved by licensing the technology prior to the proof of concept work done by the startup. Alternatively, commercializing those applications may be best pursued by the newco because in some cases there is not a company marketing products in the application space envisioned. Furthermore, it may be the case that proof of concept requires substantial capital beyond the scope of research funding within the innovator's university laboratory or department, and that access to alternative funding is the only way to advance the innovation. For example, a legally established commercial entity is required to apply for funding from US Government SBIR/STTR grant programs. Alternatively, early stage capital may be available from private (seed stage) investors.

CSUV may initially grant an Option to License to a newco (vs. a Full License). If executing on product development or commercialization is dependent on raising funds, recruiting key personnel, cross-licensing IP, or other milestone-determining factors, it may be best for everyone to postpone a Full License until certain milestones are achieved.

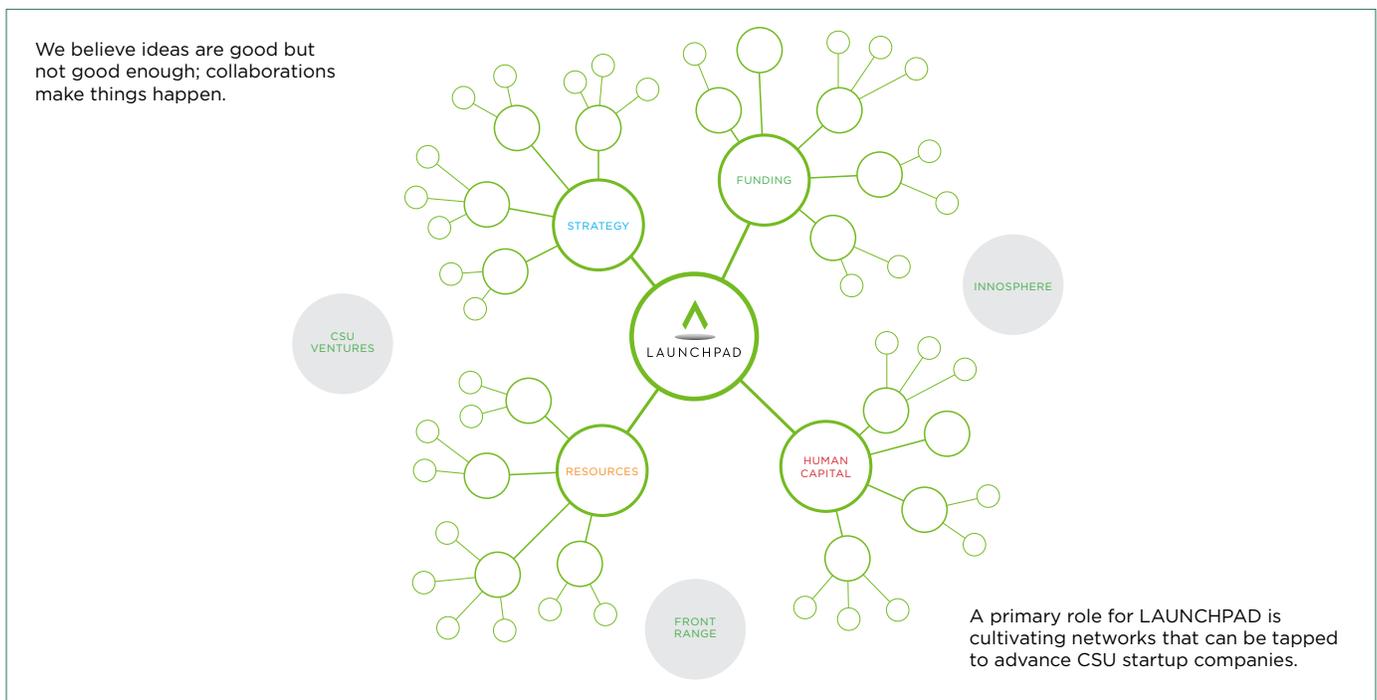
CSUV's LAUNCHPAD staff and your Licensing Director will work with you to jointly evaluate the licensing options, and proceed to a startup decision if that is the best path forward to commercialization.



CSUV's LAUNCHPAD

The starting point for engagement with CSUV's LAUNCHPAD is for the Licensing Director to obtain a signed Memorandum of Understanding (MOU) from the CSU innovators (founders) and any non-CSU founders acknowledging:

- You have read the CSUV's LAUNCHPAD Startup Primer.
- You understand that the works (inventions, ideas, materials, data, knowhow, and other creations resulting from CSU employment and/or use of university resources) that are the foundation of the contemplated startup company are the result of your CSU employment, and CSU will have ownership rights to those works. Thus, the startup company will need a license to commercialize products or services resulting from those works. CSUV is CSU's designated agent to handle licensing transactions and has ultimate responsibility to protect and commercialize CSU works. The assignment of rights to your work and the disposition of financial proceeds from it are detailed in the CSU Employee Manual, Section J, and found on the CSU website at www.webcms.colostate.edu/facultycouncil/media/sites/43/2015/03/colorado-state-faculty-admin-pro-manual.pdf.
- You understand that CSU and CSUV requires you to file or update your Department's Conflict of Interest or Commitment Form and Management Plan prior to starting this process. If no Management Plan is in place, one must be completed before any formal action to create a startup company based on your innovation. The Management Plan should specifically address three aspects of your anticipated roles in the company: a) your equity ownership in the company, b) your potential role as a paid employee or paid consultant with the company, and c) the potential for the company to do Sponsored Research with CSU, particularly with you and/or your CSU laboratory. Given the complexities involved in assessing and managing potential conflicts of interest or commitment, you may be asked to meet with CSU administrators outside of your department or college, e.g. Provost or General Counsel Offices, to tailor an appropriate plan.

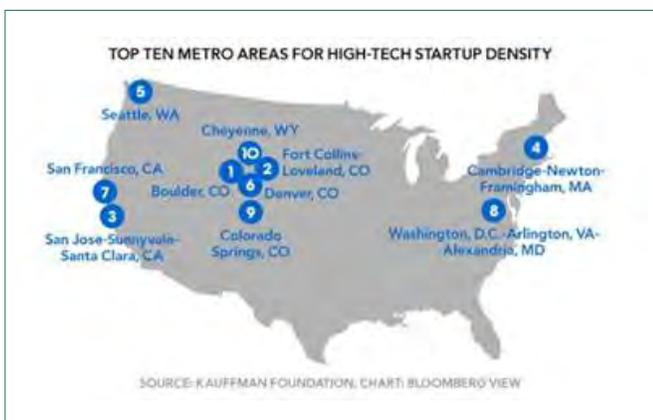


There are two primary phases to Launchpad engagement:

- **Evaluation:** take the time necessary to gain an adequate understanding of the product-market fit. This often involves ‘customer discovery’, which will help to define the product development path, milestones, resource needs, IP protection strategy, funding needs, time to market, and legal entity best suited to the opportunity, i.e., the skeleton of a business plan, and,
- **Support:** Launchpad will partner with the startup to access community resources needed to address specific newco needs. In Fort Collins and Front Range we have exceptional access to entrepreneurial resources far beyond what CSUV could offer on its own, so we actively leverage our community networks to support CSU startup companies.

Company Formation

Prior to executing a license to the innovation, a legal entity must be formed to act as the licensee. There are several legal entity types used for new business formation. Entity considerations can be complicated and it is a specialized area of law, so we recommend a knowledgeable attorney be involved. CSUV works with several experienced attorneys and will provide introductions, as needed. If you choose one of our recommended attorneys, CSUV will cover the incorporation costs and record those costs as a recoupable expense against future Section J distributions (see below - Distribution of Net Income from Innovations).



Some of the questions to which answers will help determine the optimal legal entity are:

Will the company be a not-for-profit or a for-profit enterprise?

Do you plan to build and sell the company, or have it be a ‘lifestyle company’?

Will the company need to raise substantial investor capital?

Will the company use forms of stock ownership to compensate employees?

How big do you anticipate the company to grow to be?

What is the tax liability or benefit to you as an owner?

In most cases, for-profit newcos are incorporated as either a C-Corporation or a Limited Liability Corporation (LLC), and both provide similar protections to owners/employees. A C-Corp is the classic business structure for growth companies that will require capital from serious investors. C-Corps provide the most liability protection and non-tax benefits. The major difference is that the C-Corp is taxed and must file a tax return. For an LLC, the profits (or losses) flow through directly to the owners and taxes are paid by the owners as personal income. LLCs can be converted to a C-Corp later. The conversion can be painful and costly. While it is sometimes expedient to do an “online LLC” to quickly create a legal entity that qualifies for a pitch competition, or qualifies to apply for SBIR/STTR grants, we discourage the use of this path because in almost all cases it will not be adequate to support the business needs going forward, and CSUV will not execute a full license until the licensee has an appropriately structured legal entity.

What role might the founder/innovator play in a startup?

Joining a startup company involves significant risk and commitment. Success rates for startups are sobering – more than 90% of tech startups fail. CB Insights recently compiled a list of top 20 reasons for tech startup failures based on 232 case studies (www.cbinsights.com/research-reports/The-20-Reasons-Startups-Fail.pdf). Every startup is different and the reasons for failure are rarely just one thing. That said, the items on the CB Insights list, and other lists like it, for the most part tie poor outcomes to leadership failures. While there are always exceptions to the rule, you will find a consensus among university tech transfer offices and venture capital firms that finding an experienced entrepreneur or business driver to partner with university innovators is much more likely to produce a successful startup than when the university faculty or staff person chooses to run the company. It is rare that a faculty or staff founder would give up their university position to run a startup company because of the generous benefits of university employment, effort required, and probable need to defer cash compensation as the newco invests all available capital in product development. Trying to do both also has significant potential to negatively influence decision making related to time, effort, personnel, and other things that may pit company interests against academic career priorities and university employment expectations. In short, the inherent difficulties and conflicts are often too great to overcome. That said, meaningful founder engagement is essential to its success, and we encourage it. Most faculty founders continue to support their startup as an advisor, perhaps as a Chief Technical Officer (part-time employee) or Scientific Advisory Board member, or through conduct of sponsored research back to their university lab funded by the newco.

An interesting complication may emerge where a faculty founder's postdocs or graduate students choose to join the startup as employees. While this may be important for the knowledge transfer required from laboratory research to product development, the interpersonal dynamics around definition of roles and responsibilities, career interests, personal incentives, and other factors should be addressed proactively.



GROWCENTIA (WWW.GROWCENTIA.COM) MARKETS MAMMOTH P™ AS AN ORGANIC BIOSTIMULANT TO IMPROVE PLANT PHOSPHOROUS UPTAKE AND CROP YIELDS.

Choosing the right management team and advisors is critical to success. Fortunately, we live in an exceptionally good entrepreneurial ecosystem. Launchpad has developed strong relationships in the Colorado entrepreneurial community to access resources and to work with startup founders to identify those with appropriate expertise and knowledge to address the unique needs of each startup. Pairing your strengths with those of an effective business driver will likely pay significant dividends for the newco. The following is a list of business driver experiences or characteristics that may optimize the newco's success:

- executive experience – strategic/operational
- established entrepreneurial and business network
- relevant market or technical background
- success in raising funds – angel and venture
- willingness to defer cash income

In addition, the business driver should be passionate about the innovation, and its commercial potential, be willing to commit substantial time and personal resources, and have the interpersonal skills to partner with you and network effectively in the community and market place. Launchpad will work with you to recruit the right person, and to support them through the startup's early life.

MILKEN INSTITUTE 2016 STATE TECHNOLOGY AND SCIENCE INDEX
 COLORADO RANKED 2ND OVERALL *

	Rank
Human Capital: The skill levels of the current and projected future workforce.	1st
Technology Workforce: The concentration of technical members of the workforce often described as STEM.	3rd
Technology Concentration: Technology growth in essential industry categories and sub-categories.	3rd
Research and Development: The State's ability to secure R&D funding and commercialize technology.	3rd
Risk Capital & Infrastructure: The availability of risk capital and means to commercialize new technology.	3rd

* <http://statetechandscience.org/statetech.taf?page=state&state=CO>

Finally, CSU, CSUV and Launchpad are partnered with Innosphere, the City of Fort Collins' technology incubator (www.innosphere.org), which focuses on high-growth potential companies in digital health, life sciences, software/hardware, energy, and advanced materials. Innosphere has a formal incubation program that gets companies investor ready, connects them to experienced advisors, helps them design and implement strategies to scale, and makes introductions to corporate and strategic partners. It also created the Innosphere Fund and Innosphere Investor Network to assist its client companies with funding needs, and operates an extensive advisor network which can provide companies with important expert business or technical advice to address challenges they may be facing. We strongly encourage CSU startups to 'onboard' as a Innosphere client company. Innosphere's formal onboarding program provides an intensive evaluation of the commercial potential of your innovation, your business plan, and your team.



Where will your company be located?

It depends. Some companies can be virtual. Others will need significant infrastructure to support specialized research, development and manufacturing needs required to commercialize your innovation or deliver your services. Growth companies will likely go through several stages of space, equipment, and personnel needs.

For university startups, it is not uncommon for the newco to be run out of the founder's laboratory for a time but this is not desirable except as an interim solution. Such an arrangement requires a legal agreement between the company and the university that details the space leased by the newco, payment terms, and how the company may purchase university services used by the company. CSU has worked to facilitate startup activities and has templates available to create the necessary agreements, with approvals from local management, e.g. Department Chair. In addition, CSU has designated commercial space within certain buildings. The Research Innovation Center (<http://csu-cvmb.colostate.edu/academics/mip/facilities/Pages/Research-Innovation-Center.aspx>) within the Infectious Disease Research Complex on the Foothills Campus has a floor of the building designed to support life science startups (~9200 sq. ft.) with access to BSL-2 and BSL-3 labs, as well as GMP infrastructure. The Energy Institute's Powerhouse (www.energy.colostate.edu/the-powerhouse) has designated space (~11,000 sq. ft.) for energy companies who are partnering with faculty associated with the Energy Institute or are using the Engines Lab facilities.

Outside of CSU, Innosphere has space (~30,000 sq. ft.) available for lease for its client companies. The real estate division of CSURF has properties that may also be suitable tech company space.

Funding your company

It may be possible to self-fund your startup if the capital requirements are small and you have an opportunity for early revenue, e.g. if your newco is primarily a consulting services company. For capital-intensive companies, there are usually two types of funding to consider – dilutive and non-dilutive – which are not mutually exclusive sources. Dilutive capital refers to investors purchasing equity in the startup, i.e., the original owners (founders) are diluted by addition of new investors who now own a piece of the company. Dilution is not necessarily a bad thing since new investment shows confidence in the company and its commercial opportunities, and is used to advance product development toward commercialization, both of which may increase the overall value of the company. So, while you may own a smaller percentage of the company, the ‘dilution’ probably increased the value of what you do own beyond your pre-dilution value.

Non-dilutive funding is typically from federal or state government grant programs designed to advance innovation for the country, state or region, and to result in significant economic development. Because the funding is provided as a grant to the company, no equity is exchanged to receive the funding so no dilution occurs. The Federal SBIR and STTR programs (www.sbir.gov) are the largest and most well-known types of non-dilutive funding. The program is run by the Federal Government’s Small Business Administration, in partnership with many Federal Agencies, and dates to the Small Business Innovation Development Act in 1982. Each Federal agency with an extramural budget for R&D more than \$100M must participate in the Small Business Innovation Research (SBIR) program and reserve a minimum of 3.2% (2017 allocation) of their “extramural” R&D budgets for awards to small business concerns. A similar program, the Small Business Technology Transfer Program (STTR), uses a similar approach to the SBIR program to expand public/private sector partnerships between small businesses and nonprofit U.S. research institutions. The main difference between the SBIR and STTR programs is that the STTR

program requires the company to have a partnering research institution (usually a university) which must be awarded a minimum of 30% of the total grant funds. As of 2014, Federal agencies with external R&D budgets over \$1B were required to fund STTR programs using an annual set-aside of 0.40% of their research budget. For example, in FY2016 NIH awarded nearly \$470 million in SBIR/STTR awards with an average award success rate of 15.3%.

The State of Colorado’s Advanced Industries program operated by the Office of Economic Development and International Trade (OEDIT) also provides grants to companies (www.choosecolorado.com/wp-content/uploads/2016/07/AIA-ESC-Fact-Sheet_2016.pdf) of up to \$250K but does require company matching funds. The same program provides ‘proof-of-concept’ (POC) grants to Colorado research institutions to support translational research with clear commercialization potential. CSUV administers the OEDIT POC funds allocated to CSU each year by having an open request for proposals, assembling qualified experts to augment CSU staff to evaluate proposals, and to make funding recommendations to the State. Applications from principal investigators clearly intended to advance product development for patent pending and/or technologies licensed to Colorado companies receive preferential treatment because the State’s primary goal for the program is economic development and job creation in the State of Colorado. CSUV’s FY2018 allocation allowed for funding 6-7 grants of \$70K each, excluding the 1:3 match required from the PI’s funding stream or industry collaborators.

Dilutive funding generally involves raising money from private sources. Investors come in many types. They could be friends and family but more typically are experienced angel investors or venture capital firms (VCs). A typical angel investment round may be \$250-750K. Because angel investors are often the first serious investors, they assume the greatest amount of risk and expect very high returns (i.e., they will only invest in companies with high-growth potential and a clearly articulated plan for future liquidity).



We have a strong angel community in Colorado, and one of the better angel investing groups in the nation – Rockies Venture Club (RVC - www.rockiesventureclub.org). In addition to coordinating company-angel meetings, RVC offers many educational opportunities for investors and entrepreneurs. LAUNCHPAD has partnered with RVC to offer some of its services to CSU startups.

Larger funding needs (millions of dollars) are typically the domain of VCs. Because VCs usually establish a circumscribed ‘fund’ with specific strategic interests and time constraints, it is important to understand the fund’s investment objectives and determine if it is a good fit for the company. Most VC firms will want to control a significant ownership share in the company and will require a seat on the company’s Board of Directors. Many will want to bring in their own management. This may sound overbearing and something to avoid, but the capital, input, management expertise, and industry relationships they can provide may be the difference between failure and success.

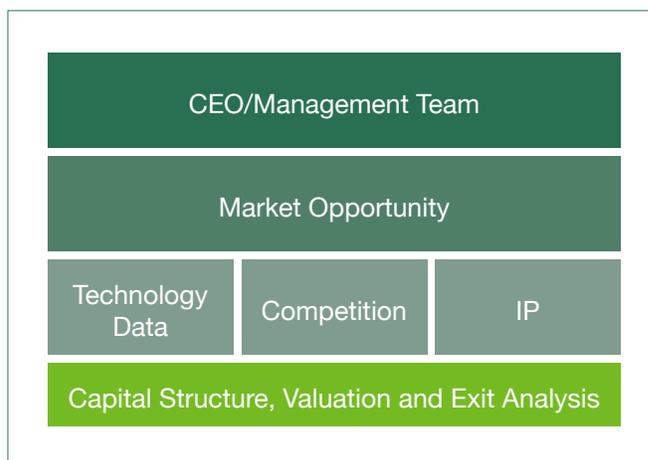
Both angels and VCs will do extensive diligence prior to making an investment which emphasizes the need to have a strong, experienced business driver leading the company. Keep in mind that in most cases investors do not receive any return on their investment until there is a liquidation event where their equity (shares of stock) can be exchanged for cash. There are different forms of investment used by angel and professional investors, e.g. convertible notes or preferred stock, and these come in many varieties with pros and cons for the company, and require the thoughtful work of the company’s executive leadership and board to navigate the best funding solutions for the company.

It may be obvious but investors do not invest in not-for-profit companies since there is unlikely to be a way for them to get a financial return on their investment. Philanthropists, foundations or government agencies are a better source of funding for these companies.

The team trumps all other elements

Building a strong management team is necessary to create a successful startup. Most investors say they invest in the team more than they invest in the technology. The figure below is adapted from a 2017 presentation from Osage University Partners, a VC firm that primarily invests in university startups. As you see, the CEO/Management Team is the most important factor in making an investment decision. The Technology and associated IP is a third-tier consideration behind the team and the market opportunity. A great innovation without a good team will probably not be successful.

Only 1 in 100 companies seeking VC funding gets funded. Recent analysis says that around 65-75% of VC invested companies fail completely or return a loss to investors. The other companies must be hugely successful to provide a significant return to VC fund investors. The stakes are high and thus the importance of addressing investibility factors early should be obvious. The numbers do not tell us how many companies fail to even get into due diligence with investors because the management team is not prepared or is not credible. Certainly one wants to avoid the tragic fate of many good ideas and technologies that suffer in a non-funded purgatory long enough that the innovations are eclipsed by others with a better team and plan.



INVESTOR DUE DILIGENCE FACTORS

Assembling an effective group of executives, advisors and board members, and partnering with your entrepreneurial community is imperative. This element is often a major challenge to university startups because of the innovation's early stage of development and associated risk. It is also highly personal – any one individual may have outsized positive or negative influence on the newco due to the small team nature of the enterprise. There are community resources which provide pro bono access to advisors which may be extremely helpful and provide temporary solutions that could evolve into long term employees or advisors. We hope you will see CSUV as partners in your startup adventure, and that you will use our team to enhance and help to build your newco team.

An additional facet of Launchpad is access to professionals that work with teams to facilitate effective communication, role definition, and leadership development based on maximizing individual strengths and behavior styles. Effective use of each team member's skills is critical to success and given the small team size and precarious financial footing of most newcos, there is little margin for error in creating the right team formula for effective working relationships, roles and responsibilities.

Exit Strategy

For everyone who owns a share of the newco the only way to translate those shares into cash is for the newco to create an opportunity to sell those shares to someone else. If it is a 'lifestyle' company and can create enough free cash to provide a comfortable living or side-interest for the founders, there may be no need to ever sell the company or liquidate shares in the company. However, most technology companies anticipate scaling to a significant valuation or being acquired by a larger company, and founders/investors will expect a return on their investment which generally requires sale of their shares. This opportunity to sell is usually defined as the 'exit'. For most companies, this means your investor pitch and business plan must recognize the anticipated timing and milestones for an exit upfront and articulate a robust case for how the company will scale and grow revenues to provide a financially attractive exit opportunity. Your business driver will need to have this eventual event in mind as he/she drives product development and commercialization, and manages investor expectations.

Of course, building a company to grow revenues and scale to sustainability does not require it be sold, and there may be alternative ways to provide returns to investors, such as dividends. Regardless, strong growth prospects will provide exit opportunities or create a cash position that creates alternatives for investor returns. A 'we'll figure it out as we go' strategy is not likely to attract serious investors, or be an effective strategy to build a successful company. Whether looking to achieve a successful exit or build an enterprise with long-term sustainability a trajectory to profitability is essential.

The Pitch (Business Model)

The working business plan for a startup is often best represented as a pitch presentation, that details how you will create, deliver, and capture value. The pitch is a way that you communicate with investors or potential strategic partners (or philanthropists, foundations or government agencies if you are a not-for-profit) the value proposition represented by the innovation being developed and commercialized by the newco. Critical elements will be communicating the strength of the team, the core elements of the innovation, differentiating aspects of the products or services (value proposition), and an investor prospectus. The pitch may also be an essential tool for communicating to newco employees the strategic and tactical elements they must understand to fully contribute to the newco's success. A useful format has been created by the Stanford Research Institute (SRI) and is built around the NABC tool:

N for Need. *N is the most important factor in the method. An idea without a practical need for it remains just what it is: a good idea and nothing more.*

A for Approach. *A tells how you will address N, and is usually a point of departure for most activities, but with the NABC method, A always comes after N.*

B for Benefit. *B stands for the innovative elements of an idea or technology, in other words that which constitutes its uniqueness.*

C for Competition. *C stands for a study of the competition existing in the area concerned. C is often mistaken for N. C, however, focuses on the reality within which a concept must function or demand customer attention.*

A simple illustration from SRI is:

I understand that you are hungry (the need). Let's go to the SRI Cafe (the approach). It is close, the food is good and it is quiet there so we can continue working (the benefits). The alternative is McDonald's, which is noisy at lunchtime (the competition or alternative).

A good pitch is brief and uncomplicated. The lower the slide number and the fewer the words on each slide, the better. Consider the pitch to be a teaser and not an encyclopedic summary – something that will bring members of the audience back for more in-depth discussion because of the excitement it generates. It is a process to create, refine, and iteratively adapt a pitch as one learns more about customer needs, technical feasibility and cost elements of final product development. Iteration is essential. One must continuously assess customer interest and competition to create a compelling proposition that will pave the way to product sales or future funding. Appendix D contains more information on SRI's NABC method and a link to an online resource with more details on pitch format and philosophy. You may also find many other pitch formats or examples online. Choose one, get started, and keep iterating!

Distribution of Net Income from Licensed Innovations

Finally, if your innovation is successfully commercialized by a licensee (whether it is an established company or a startup you founded), any revenues obtained from that license are usually distributed per Section J of the CSU Academic Faculty and Administrative Professional Manual (www.facultycouncil.colostate.edu/faculty-manual). All revenue received by CSURF/CSUV from the licensed innovation is treated as 'net income'. (License-derived income may be from upfront fees, royalties on sales of product and services, product development or commercialization milestones written into the license agreement, or sale of CSUV-owned equity in your startup). Net adjusted income subject to distribution is calculated as total income less recoupable expenses made by CSURF/CSUV in direct support of intellectual property protection, e.g. patent application and prosecution expenses, entity incorporation fees, or any payments made by CSUV on behalf of the newco. License proceeds received by CSURF/CSUV are distributed per the following formula:

- 35% to innovators
- 10% to innovators' home College
- 15% to CSU OVPR
- 40% to CSURF/CSUV

For a CSU employee founder of a startup company based on CSU-licensed technology, the founder will also have founder equity in the company, and may receive subsequent cash and/or equity for services performed on behalf of the startup company, e.g. compensation received for services rendered in an advisory role. A successful exit or sale of the company would result in the founder receiving cash for the value of the equity they hold in their name. In addition, they (the CSU employee founders collectively) would personally receive (share) 35% of any equity value held by CSURF, and would have received 35% of any company revenue received from sales of products or services derived from the CSU-licensed technology. Note that if CSUV invests directly in the company or converts company debt against CSUV payments made on the newcos behalf, any resulting equity held in CSUV's name would not be subject to Section J distribution.



ACCESS SENSOR TECHNOLOGIES (WWW.ACCSENSORS.COM) MANUFACTURES AND SELLS UPAS (ULTRASONIC PERSONAL AIR SAMPLER) FOR ASSESSING AIR QUALITY TO INDUSTRIAL HYGIENE AND RELATED MARKETS.



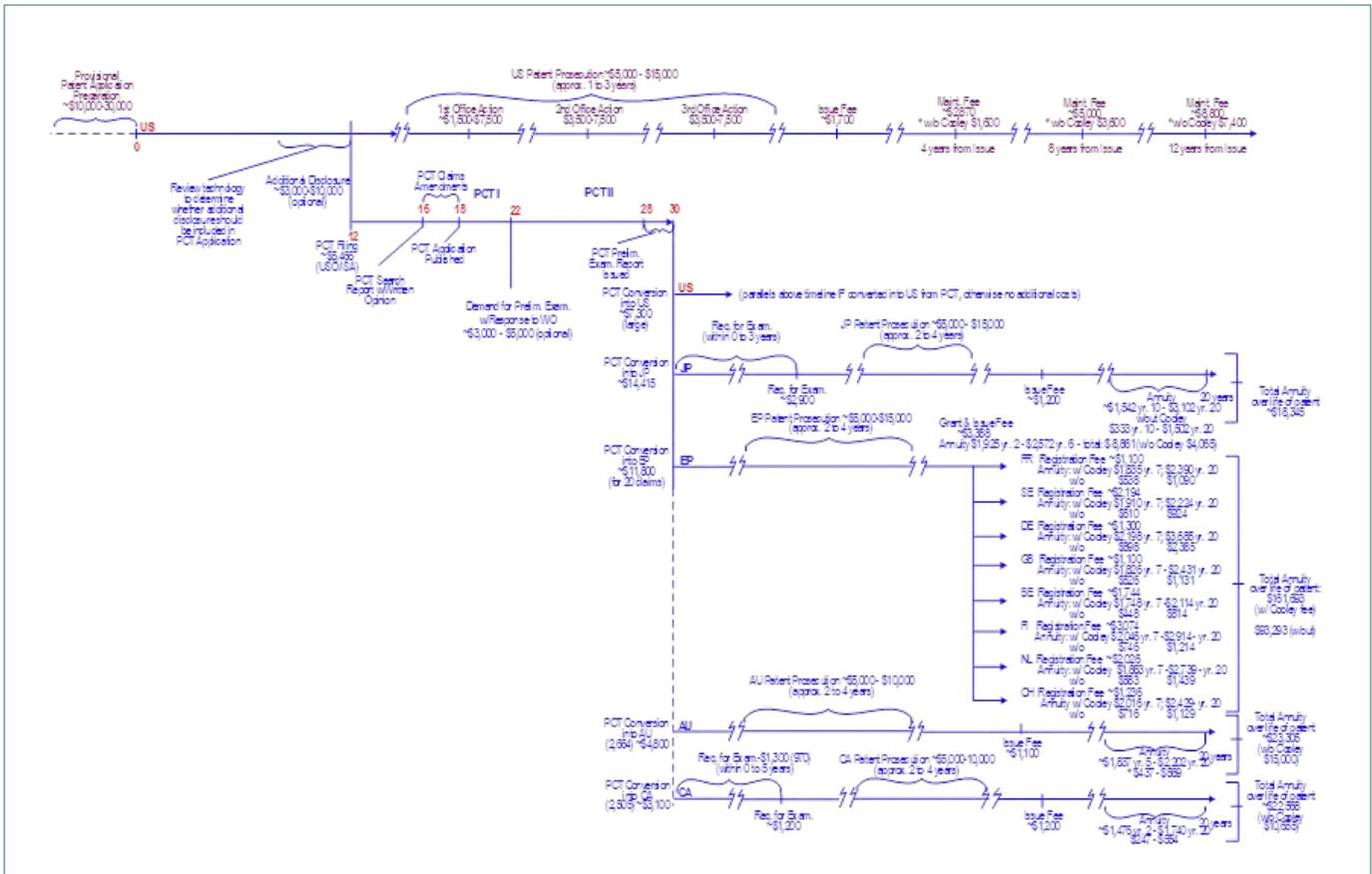
CONCLUSION

We hope this primer answers many of your questions about starting a company based on innovations resulting from your creative works as a CSU employee. We know that there are likely to be remaining questions and that every case has unique elements, and thus we stand ready to answer your questions. Please feel free to contact anyone at CSUV to start the conversation but look first to the Licensing Director most familiar with your research.

Onward and Upward!

APPENDIX A

Appendix A: Estimated Patent Filing and Prosecution Costs and Timing



APPENDIX B

Appendix B: CSUV Launchpad Technology Readiness Level Tool

It is important that CSUV staff gain an accurate understanding of the stage of development of the technology to be licensed. To accomplish this, CSUV adapted a version of NASA's Technical Readiness Level (TRL) construct. This tool helps define an objective score of the readiness level of the technology in its current iteration and is critical to help identify appropriate diligence milestones that will be included in the license. Your Licensing Director will work with the you and the other company principals to come up with an agreed-upon level that is appropriate for the technology in question.

TECHNICAL READINESS LEVEL (TRL)	
Readiness level	Technology Readiness Parameters
1	Basic scientific principles of underlying technology have been observed and reported. (Foundational Scientific principles highlighted)
2	Basic scientific principles have been formulated into a technology concept and/or application. (Proposed match of scientific principles and application stage)
3	Analytical studies identify the appropriate fit between the demonstrated scientific principles and the proposed technology application. (theoretical proof of concept fit stage)
4	Proof of concept validation at lab scale. Scientific principles are directly tied to the technology application at a basic functionality stage. (Proof of concept demonstration stage)
5	Technology proof of concept validated in relevant environment and/or conditions. Validation still at lab scale, but real-world constraints are now introduced into proof of concept testing. (Proof of concept- real world demonstration stage)
6	Technology validated in operational environment and conditions. Validation is moved out of lab scale and into an operational environment and all critical scaling issues have been addressed. Technology performance is assessed in the actual operating environment. (Operational environment testing stage)
7	Technology is combined and tested with other applicable systems required in fully operational product or service.
8	Technology is fully incorporated into a retail product.
9	Technology fully incorporated into a retail product with active sales. (active sales stage)

The agreed upon TRL at time of License is: _____

The mutually agreed upon near term (18mo) Diligence Milestones are:

- a)
- b)
- c)

APPENDIX C

Appendix C: CSUV Launchpad Startup Evaluation Tool

CSU STARTUP EVALUATOR				
Technology or Product (15%)	<i>Does Not Meet Expectations (1-2)</i>	<i>Moving Toward Expectations (2-4)</i>	<i>Meets Expectations (4-6)</i>	<i>Exceeds Expectations (6-7)</i>
Licensed IP	Novelty and FTO unclear Invention Disclosure only	Defensible Novelty & Likely FTO Provisional or US/PCT Filed	Defensible Issued Claims US and Major Ex-US Markets	IP portfolio of broad enforceable claims protecting product value
Technology Status	Suggestive data but limited	Data driven optimization underway	Definitive proof of concept	Product ready for market
Development Risk	Still conceptual - lots of variables & unknowns; High regulatory hurdles; challenging competitive landscape	Technical Feasibility Issues Identified; Regulatory path defined; clear competitive advantages	Product or prototype meets Target Product Profile criteria; market need is clear	Regulatory risk removed; industry partner identified to co-develop/manufacture/sell etc.
Maturation Cost	>\$1M to value inflection milestone, or commercial launch	<\$500K to value inflection milestone, or commercial launch	<\$100K to value inflection milestone, or commercial launch	<\$50K to value inflection milestone, or commercial launch
Maturation Time	>3yrs to value inflection milestone, or commercial launch	2-3yrs to value inflection milestone, or commercial launch	1-2yrs to value inflection milestone, or commercial launch	<1yr to value inflection milestone, or commercial launch
Team (25%)	<i>Does Not Meet Expectations (1-2)</i>	<i>Moving Toward Expectations (2-4)</i>	<i>Meets Expectations (4-6)</i>	<i>Exceeds Expectations (6-7)</i>
Inventor or Founder	Inventor unavailable. Lab has no research funding.	Unresponsive; difficult to schedule; limited research funding	Engaged; responsive; Well-funded research aligned with startup product development needs	Credible industry connections; prior successful startup experience
Business Driver	There isn't one.	Inventor is it, or one identified does not have relevant experience	Driver in place with relevant technical, financial, and commercial market experience	Record of success as an entrepreneur; well connected to industry and funding
Team	There is no team.	Lack of role/responsibility definition or understanding; faculty, postdocs and students	Team is functional; clear roles and responsibilities; team includes non-university personnel	Team has no near term gaps; Demonstrated entrepreneurial success; fully committed to newco
Advisors	No advisors identified	Advisors engaged but serious gaps in expertise exist	Engaged advisors that cover Team's technical and business gaps	Evidence the Team uses the Advisors to make decisions

APPENDIX C

Market Validation (20%)	<i>Does Not Meet Expectations (1-2)</i>	<i>Moving Toward Expectations (2-4)</i>	<i>Meets Expectations (4-6)</i>	<i>Exceeds Expectations (6-7)</i>
Customer Discovery	No evidence of meaningful customer engagement	Some customer engagement; early adopters identified	Extensive (>25) customer interviews conducted/analyzed.	Purchasing decision defined on product performance, price, etc.
Market Analysis	There isn't one.	Assumptions on market adoption used to create revenue proforma	Assumptions supported by direct market research (non-syndicated)	Addressable market segmentation and sizing supported by top-down and bottom-up analysis
Market Size	<\$10M	\$10 - 50M	\$50-500M	>\$500M
Market Growth	Zero or negative.	Growing in step with economy	Growing faster than economy	Explosive market
Industry Landscape (10%)	<i>Does Not Meet Expectations (1-2)</i>	<i>Moving Toward Expectations (2-4)</i>	<i>Meets Expectations (4-6)</i>	<i>Exceeds Expectations (6-7)</i>
Partnership Channel	No meaningful industry relationships	Potential industry partnerships/channels identified but no evidence of engagement	Evidence that industry/channel partner relationships are being actively cultivated	Industry or channel partnership agreements in place.
Incumbent's Power	Incumbents often stifle startups in this industry - buy or crush	Powerful incumbents sometimes stifle innovation. Value chain is slow to accept newcomers.	Opportunity for startups to innovate in this industry - openness to adopt innovation.	Incumbents depend on startups for innovation. Incumbent-startup partnerships common.
Regulatory Path	Required to commercialize, but no plan in place.	Required to commercialize; plan and personnel to address in place.	Low bar; progressing toward meeting requirements.	No regulatory oversight; or all regulatory requirements met.
Reimbursement (if healthcare)	Requires reimbursement. No evidence of CPT code acquisition.	Requires reimbursement. Making progress on CPT code acquisition.	Requires reimbursement. CPT code pending.	Does not require reimbursement or CPT coding.

APPENDIX C

Business Model (20%)	<i>Does Not Meet Expectations (1-2)</i>	<i>Moving Toward Expectations (2-4)</i>	<i>Meets Expectations (4-6)</i>	<i>Exceeds Expectations (6-7)</i>
Company Economics	No financial projections.	Unrealistic financial projections. Assumptions not well supported.	Credible financial projections for costs and revenue.	Financial projections convey comprehensive understanding.
Scalability	Difficult, perhaps impossible, to scale – at best a life-style business.	Incomplete scaling plan but seems possible.	Feasible but unproven scaling plan in place.	Validated scaling strategy. Successful analogs exist
Downstream Value	No value analysis. Cannot say how customers/partners will profit.	Incomplete analysis. End-user ROI or margins described.	Clear understanding of customer value issues and ROI expectations.	Proven downstream value, and strong-evidence of high ROI.
Customer Acquisition	No strategy. (“product will sell itself”)	Sales/marketing plans not credible but target customers identified.	Credible customer acquisition strategy & feasible marketing plan.	Validated strategy that is scalable; demonstrated customer success.
Funding Strategy	No detailed understanding of funding need. Multiple rounds likely.	Value inflection milestones defined but inadequate funding plan.	Well defined funding plan linked to valuation milestones.	Relevant recent exit multiples provided; investor ROI clear.

APPENDIX C

Investibility (10%)	<i>Does Not Meet Expectations (1-2)</i>	<i>Moving Toward Expectations (2-4)</i>	<i>Meets Expectations (4-6)</i>	<i>Exceeds Expectations (6-7)</i>
Funding Readiness	Unattractive to investors – will not be able to raise money.	Investor interest but business plan, team, technology readiness, and or other issues need to be addressed.	Attractive to investors but significant effort to raise necessary funds.	Highly attractive; lead investors identified. Full funding likely.
Pitch	There is none.	Draft pitch demonstrates basic understanding of essential pitch elements but a lot of work required.	Clear, logical and compelling pitch that addresses investor/ partner needs in 12 slides or less.	Persuasive, professional delivery. Pitch format is professional, clean, and low word density. Practiced.
Executive Summary	There is none.	Draft summary created but needs a lot of work.	One page summary clearly defines problem and solution; key elements of technology and company; investment proposition.	Summary has yielded investor or partner responses; different versions created to address specific audience needs.
Exit Strategy	No plan.	Plan to grow company to position for exit by acquisition, but >5yrs required to achieve milestones.	Product development, revenue or other milestones position company for an “early exist” (<3yrs)	Engagement with potential acquires, or direct investment from strategic venture funds

Composite Score: _____

APPENDIX D

Appendix D – Stanford Research Institute’s NABC Method

Need: What are our client’s needs? A need should relate to an important and specific client or market opportunity, with market size and end customers clearly stated. With DARPA, for example, we are required to state a critical Department of Defense (DoD) need. The market should be large enough to merit the necessary investment and development time.

Approach: What is our compelling solution to the specific client need? Draw it, simulate it or make a mockup to help convey your vision. As the approach develops through iterations, it becomes a full proposal or business plan, which can include market positioning, cost, staffing, partnering, deliverables, a timetable and intellectual property (IP) protection. If we are developing a product, it must also include product specifications, manufacturing, distribution and sales. DARPA usually demands paradigm-shifting approaches that address a specific DoD need (e.g., a 10-times improvement).

Benefits: What are the client benefits of our approach? Each approach to a client’s need results in unique client benefits, such as low cost, high performance or quick response. At DARPA, the benefit might be an airplane that turns faster, goes higher, costs less or is safer. Success requires that the benefits be quantitative and substantially better - not just different. Why must we win?

Competition/alternatives: Why are our benefits significantly better than the competition? Everyone has alternatives. We must be able to tell our client or partner why our solution represents the best value. To do this, we must clearly understand our competition and our client’s alternatives. For a commercial customer, access to important IP is often a persuasive reason to work with us. At DARPA, our competition is usually other research laboratories and universities across the United States. But, whether to a commercial or government client, we must be able to clearly state why our approach is substantially better than that of the competition. Our answer should be short and memorable.

See this link for more information on the NABC method - <https://nielschrist.wordpress.com/2012/07/13/the-nabc-method-standford-research-institute-sri>.