

RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY

Faculty Start-up Guide

New Ventures Team (NV)

<http://orc.rutgers.edu/startups>

This guide is for Rutgers faculty and researchers interested in pursuing a University start-up company. In addition to this guide, you may find helpful the [guide on applying for SBIR/STTR awards](#). This guide has significant resources available only through hyperlinks. For the best user experience, this guide should be read in a digital format on a device with an active internet connection.



RUTGERS

This document was prepared by NV for informational purposes only. While we have endeavored to present the most accurate information possible, we cannot guarantee that this information is up-to-date. NV encourages the reader to contact a NV team member with any questions.

Introduction

The Rutgers New Ventures (NV) team is a group within the Office of Research Commercialization (ORC) that works with faculty, the ORC licensing managers and intellectual property (IP) teams, investors, experienced entrepreneurs, and industry to commercialize Rutgers technologies through start-up company formation. The NV team also supports student-led start-ups through mentoring and the I-Corps program.

This document was prepared for our Rutgers faculty as a step-by-step guideline in considering and forming a start-up. The document also explores questions each faculty should ask in determining whether a start-up is the best path forward both, for themselves and in commercializing their technologies. While faculty new to entrepreneurship will benefit most from this document, we encourage even experienced faculty to review the material as the NV team is continually updating this document for time-proven best practices.

To learn more about NV and what a start-up might entail for you, please visit our website <http://orc.rutgers.edu/startups> or contact us per the contact details below.

We look forward to working with you!

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Step-by-Step Guideline for Start-up Formation

Action Items*		PI	BF	NV/ ORC	Ref. Page
1	Visit the Rutgers New Ventures webpage and review information regarding University start-ups (http://orc.rutgers.edu/startups)	●			4-6
2	Review carefully the following IP and HR policies^ for Rutgers (50.3.1 , 50.3.7 , 60.5.8 , & 60.5.9) and legacy UMDNJ (50.3.14 & 50.3.15).	●			4-6
3	Consider the relevant intellectual property (may be multiple) for licensing and review its current prosecution status. Speak with ORC Licensing Manager.	●		●	4-6
4	Schedule a meeting with the NV team to discuss the opportunities, process, and resources available in pursuing a start-up company. (Yair Harel: yharel@otc.rutgers.edu or Luis Ahn: luis.ahn@rutgers.edu)	●		●	7-9
5	Inform your Department Chair or Unit Head of your interest in considering a start-up	●			--
6	Identify possible business founders (e.g., CEO). (Note: Rutgers policies prohibit full-time faculty to take fiduciary roles at a company for any extended period.)	●		●	7-9
7	Work with the business founder(s) to develop a business plan and assess start-up feasibility	●	●	●	7-9
8	Identify qualified legal and accounting counsel to assist with the formation, structuring and proper registration of a new legal entity (incorporation)	●	●		10
9	Incorporate the new start-up with support from proper counsel	●	●		10
10	Identify the lead negotiator to enter into a licensing agreement with Rutgers. Rutgers prohibits <u>PIs as lead negotiators</u> . The negotiator could be the business founder or third-party counsel representing the start-up's interests.	●	●		--
11	Enter negotiations for a licensing agreement with Rutgers		●	●	--
12	All Rutgers faculty and staff involved with the start-up should commence the Conflict of Interest (COI) and Conflict of Commitment review. The process begins by formally submitting a COI Questionnaire.	●		●	11-12
13	The start-up enters into a licensing agreement with Rutgers		●		--
14	Identifying and pursuing start-up funding	●	●	●	13-14
15	Maintain compliance with the licensing agreement		●		--

* Action item responsibilities for:

PI = Principle Investigator or Principle Inventor

BF = Business Founder or the start-up's CEO

NV/ORC = New Ventures and/or ORC team

Ref. Page = Page number in this document with more details

^ If individual links do not work, please go to the [Policy Library](#). You can search for the specific policy by using the Section/Policy identifier (e.g., 50.3.1) listed in this document.

I. University Policies for Faculty and Staff

A. Overview of Patent Policy

Please carefully review the following patent policies for:

- Rutgers: [50.3.1](#)
- Legacy UMDNJ: [50.3.14](#)
- *If the links above do not work on your device, please go to the [Policy Library](#). You will be able to search for the specific sections by Section (Section 50 in this case).*

The Rutgers patent policy outlines the ownership, royalty distribution and relevant processes concerning the disclosure and patent prosecution of university-derived inventions. In general, these policies do not apply to undergraduate student inventions unless they have been afforded extraordinary resources or otherwise bound by contract (employment) or agreement.

1. Faculty and staff are required to disclose inventions to, for review by, the Office of Research Commercialization (ORC) before public disclosure. Forms and instructions on how to file an invention disclosure can be found [here](#).
2. All faculty and staff are required to assign to Rutgers the rights to their inventions. In some cases, these rights may be returned to the inventor at the discretion of ORC.
3. ORC shall decide if it is in the best interests of the University to pursue patent protection.
4. ORC can enter into specific licensing agreements to commercialize technologies.
5. Summary distribution of licensing income (PLEASE READ THE RESPECTIVE RUTGERS AND LEGACY UMDNJ **PATENT POLICIES** ([50.3.1](#) and [50.3.14](#)) FOR DETAILS AND PRECISE DEFINITIONS)
 - a. **Legacy Rutgers:**
 - i. Distribute the first \$5,000 of Gross Income to the inventor;
 - ii. then, deduct expenses directly assignable to the specific patent;
 - iii. then, distribute the Net Income as:

	First \$100,000	Above \$100,000
Inventor	25%	28%
University & ORED	25%	32%
Research Unit*	40%	30%
Department*	10%	5%
Dean/Director		5%

** A Research Unit is defined as Bureau, Center, Institute, or Department in which the research that resulted in the licensed invention was conducted and funded. In some cases the Research Unit and Department are identical. Thus, the distribution could result in 50% to a single unit.*

- b. **Legacy UMDNJ:**

	Inventor's Equity Interest and Election			
	<u>0%-10% Equity Interest*</u>	<u>>10% Equity Interest*</u>	<u>Elects Reduction in Personal Distributions</u>	<u>Elects All Personal Distributions to Support Research</u>
Inventor	35%	0%	17.5%	0%
University & ORED	15%	40%	15%	15%
Research Unit**	25%	30%	50%^	67.5%^^
Department***	25%	30%	17.5%	17.5%

* *Equity interest in the outstanding shares of a company that licenses the invention, determined at the time of licensing the invention.*

** *Distributions to be at the discretion of the pertinent Dean or Vice President.*

*** *Primary consideration in the allocation of the funds shall be given to the support of the inventor's research, with the approval of the pertinent Dean or Vice President.*

^ *Comprised of 32.5% to the inventor's research account + 17.5% to the inventor's department, with further allocation from the department subject to the discretion of the pertinent Dean or Vice President.*

^^ *Comprised of 50% to the inventor's research account + 17.5% to the inventor's department, with further allocation from the department subject to the discretion of the pertinent Dean or Vice President.*

B. Intellectual Property (IP) Assessment

The scope, defensibility, and uniqueness of intellectual property have a significant impact on a start-up's ability to raise funding from investors, and effectively commercialize a given innovation.

Therefore, first step in the formation of a University start-up is to identify specifically what IP should (and needs to) be licensed from Rutgers, for the short-, mid-, and long-term success of the start-up.

In some cases, a firm may want rights to multiple related patents to keep their opportunities broad. However, this typically leads to higher costs and management burden (e.g., patent prosecution, multiple progress and milestone requirements, and other considerations). The start-up needs to strike a delicate balance between developing an extensive IP portfolio that provides solid patent protection, and the allocation of resources to other aspects of the business-like technology de-risking, product development, and business development.

In other cases, you may identify patents that you wish to incorporate into your business at a future date (in accordance with your business plan and model). In the meantime, you could preserve your rights to them through mechanisms such as an option agreement.

If you are unsure about your IP status, or which technologies you may want to pursue, we highly recommend you contact your [Licensing Manager](#) or our [New Ventures](#) teams. Ultimately these types of decisions should be made in consultation with all stakeholders – your business founder, legal advisors, and Rutgers ORC.

Finally, **do not underestimate the value of know-how**. Know-how is the information, knowledge, processes and experience that allow the possessor (e.g., a licensee) to achieve practical results not achievable by someone without them. In the case of Rutgers start-ups, know-how might be contained within a faculty researcher or the lab, from which the original innovation is derived. If access to know-how involving your technology will be important to your company's success, you will want to include rights to this IP in the license agreement with your start-up.

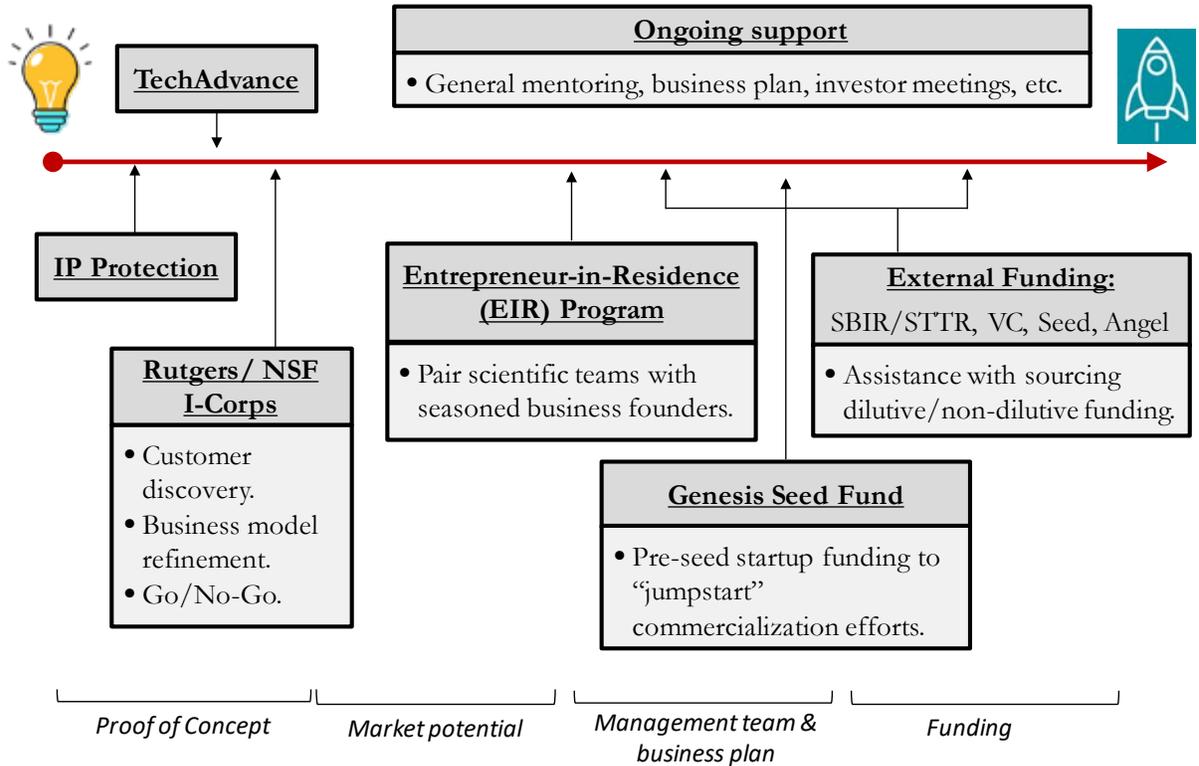
Additional IP assessment resources:

- USPTO's IP awareness assessment tool to identify the types of IP that are important for your start-up's business model/plan ([URL link here](#))

II. New Ventures: Internal Resources for Start-ups

From idea and innovation...

...to a successful startup



A. TechAdvance Fund (techadvance.rutgers.edu)

- **Early stage technology development fund** created to advance technologies toward commercialization by bridging the gap between basic research and commercialization-readiness
- TechAdvance™/TechXpress™- grants of up to \$100K/\$10K, respectively, depending on the scope of work. Note, TechAdvance is designed for pre-startup funding; however, we encourage faculty considering start-ups to leverage this resource as a steppingstone towards commercialization.

B. Entrepreneur-in-Residence (orc.rutgers.edu/startups/entrepreneur-in-residence)

- Program designed to pair scientific teams (PIs) with **seasoned business founders**
- **Each EIR selects a specific technology**, teams up with the inventor(s), and becomes the management nucleus of the start-up
- Maximizes the probability of success of Rutgers startups
- Expertise of our current EIR pool span drug development, medical device, nutrition, personal care, and IT (mobile/cloud, general software, and others)

C. Genesis Seed Fund

- Early-stage **start-up funding** to jump-start commercialization efforts
- Works synergistically with our EIR Program
- Eligibility requirements are designed to ensure serious effort, commitment, and business development plan.
- Up to \$25,000 for qualified startups.

D. Rutgers / NSF I-Corps (oed.rutgers.edu/content/rutgers-i-corps-site)

- Customer discovery program with business mentoring and entrepreneurship training as well

E. Ongoing Support

- Assistance with business plans and investor presentations
- Assistance with sourcing both non-dilutive and dilutive funding
- General mentoring throughout the start-up process

F. Funding

- Please see a later Section “Identifying and Pursuing Funding for Start-ups” for more details.

III. Creating Investor Presentations & Business Plans

A. Start-ups in Life Sciences

- Life Sciences technologies—whether in therapeutics, medical device, or services—have a unique set of challenges and requirements compared to non-life sciences fields.
 - Investors in Life Sciences start-ups are particularly keen on regulatory (capital and time requirements) and intellectual property (patentability, patent life) matters.
 - Given the lack of publicly available resources designed for start-ups in life sciences, our NV team created a [template investor presentation](#), an abridged version of which is also available in the Appendix section.
 - While this presentation was created with Life Sciences faculty in mind, the framework of the presentation can be used for other fields as well.

B. Start-ups in non-Life Sciences

- In contrast, for non-life sciences start-ups, there exists a plethora of examples and information, available publicly, on how to prepare investor presentations and business plans.
 - You can find some of those resources in the middle to bottom sections of the following [link](#).

C. General Guidelines for Investor Presentations & Business Plans

- Whatever field the start-up is in, some key topics an investor presentation **must** address are:
 - What is the problem and **unmet market** need?
 - How is the company **solving** it?
 - Who is the company solving it for? (who **specifically are your customers**)
 - How is the technology **unique**? (discuss key metrics relative to existing solutions)
 - What is the **current stage** of development? (patent status, POC*, MVP*)
 - What do you plan to **accomplish** over the near-term? (be specific)
 - If you raise funding, **how exactly will you spend** it?
 - Ultimately, **how will the investor make money**?

* *Proof-of-concept: a research idea or innovation that has been reduced to practice.*

* *Minimum viable product: a product that has just enough features to satisfy early customers.*

- **Business model canvasses** are an increasingly popular tool to help refine a company's business development plan.
 - [Basics of a business model canvas](#) (Wikipedia)
 - [Various tools for start-ups](#), including business model canvas how-to's (Steve Blank)
 - Steve Blank is well regarded in the world of entrepreneurship, particularly in commercialization of lab research.
- Please also see the Appendix for a tool you can use on **Start-up Viability and Business Planning**.

IV. External Resources for Start-ups

A. Law Firms

The law firms below have practices dedicated to early-stage companies. Please note, the list below is **not an endorsement** by Rutgers. **It is for informational purposes only** and listed in alphabetical order. Each PI is encouraged to use their discretion. Click [here](#) for the list in downloadable form.

Law Firm	Website	Contact	NJ Location	Bio
Chiesa, Shahinian & Giantomasi (CSG)	http://www.csglaw.com	Sean M. Aylward	West Orange	http://www.csglaw.com/?r=biographies/sean-aylward
		Roger J. Breene	West Orange	http://www.csglaw.com/?r=biographies/roger-breene
		Michelle A. Schaap	West Orange	http://www.csglaw.com/?r=biographies/michelle-schaap
Day Pitney	https://www.daypitney.com/	David M. Waizer	Parsippany	https://www.daypitney.com/professionals/W/Waizer-David-M
		David P. Doyle	Parsippany	https://www.daypitney.com/professionals/d/doyle-david-p
		Lori J. Braender	Parsippany	https://www.daypitney.com/professionals/b/braender-lori-j
DLA Piper	https://www.dlapiper.com/	Andrew Gilbert	Short Hills	https://www.dlapiper.com/en/us/people/g/gilbert-andrew-p/
		Rene Veloso	Short Hills	
DrinkerBiddle	http://www.drinkerbiddle.com	James Biehl	Princeton	http://www.drinkerbiddle.com/people/attorneys/biehl-james
		James M. Fischer	Florham Park	http://www.drinkerbiddle.com/people/attorneys/fischer-james-m
		Ian P. Goldstein	Princeton	http://www.drinkerbiddle.com/people/attorneys/goldstein-ian-p
Giordano, Halleran & Ciesla	http://www.ghclaw.com/	John A. Aiello	Red Bank	http://www.ghclaw.com/Bios/index.cgi?uniquePerson=49&bioStat
		Kurt E. Anderson	Red Bank	http://www.ghclaw.com/Bios/index.cgi?uniquePerson=50&bioStat
		Paul T. Colella	Red Bank	http://www.ghclaw.com/Bios/index.cgi?uniquePerson=44&bioStat
K&L Gates	http://www.klgates.com	Frank L. Politano	Newark	http://www.klgates.com/frank-l-politano/
		Stephen A. Timoni	Newark	http://www.klgates.com/stephen-a-timoni/
Laberee Law	http://labereelaw.vpweb.com/	Peter W. Laberee	Medford	http://labereelaw.vpweb.com/About-Us.html
McCarter & English	http://www.mccarter.com	Matthew E. Uretsky	East Brunswick	http://www.mccarter.com/Matthew-E-Uretsky/
		Jared M. Sorin	East Brunswick	http://www.mccarter.com/Jared-M-Sorin/
		David J. Sorin	East Brunswick	http://www.mccarter.com/David-J-Sorin/
Morgan Lewis	http://www.morganlewis.com	Steven M. Cohen	Princeton	http://www.morganlewis.com/bios/scohen
		David G. Glazer	Princeton	http://www.morganlewis.com/bios/dglazer
		Alan B. Leeds	Princeton	http://www.morganlewis.com/bios/aleeds

B. Affordable and No-Cost Legal Services

- **Rutgers School of Law:** For more information about the Newark and Camden clinics, please visit the [Legal Clinics Webpage](#).
- [Rutgers University Student Legal Services](#) (RUSLS) provides eligible Rutgers University students with professional legal advice and assistance at no cost by attorneys licensed to practice in the State of New Jersey.

V. Conflict-of-Interest (COI) Review

A. Overview of COI Policy

Please carefully review the [COI guidelines](#).

Rutgers University faculty and staff have a **fundamental obligation to act in the best interests of the University** and not let outside activities or outside financial interests interfere with that obligation. Full time Rutgers employees involved with starting a new company while maintain their University position must manage potential conflicts-of-interests and conflicts-of-commitments.

- Faculty members may not represent or negotiate for outside organizations (including start-ups) connected with contracts, grants, applications, cause, proceeding, or other matter pending before the University
- Faculty members may not act on behalf of the University in any matter involving an outside organization in which they have a direct or indirect financial interest and must disclose of any outside financial interest
- Faculty members may not use their positions at the University to secure inappropriate privileges or advantages for themselves or others
- Full-time faculty members whose outside employment averages five (40 hours) or more days a month shall report such employment to their Department Chair or unit head
- Faculty involved with Rutgers start-ups must undergo a conflict-of-interest review
- **Please review the [COI guidelines](#) and fill out the [COI Questionnaire](#). A Department Chair Letter of Support must also accompany the COI Questionnaire submission (template).** If you have any questions, please contact a [NV team member](#) or a member of the [COI committee](#) directly.

B. Strategies to Manage Conflicts

- **Be aware** of situations and circumstances that may lead to conflicts
- All faculty and staff should **inform their Chairs/Unit Heads early** on about their intentions to pursue a start-up.
- **Communicate openly** with your department chair and the ORC team
- Keep your company **activities separate and distinct** from your Rutgers employment and teaching activities. You may want to use separate email addresses and phone numbers and avoid use of University resources and facilities when conducting company activities

C. Examples to Consider

(Continued on next page)

Examples to Consider

No perceived conflict	Appearance of conflict	In conflict
<ul style="list-style-type: none"> • Use Rutgers equipment via a contract; said equipment must be available for use by any external company. • Serve as a non-voting board member or advisor. • Assign new IP rights to Rutgers according to Patent Policies. • Hire former university affiliates (students, postdocs). 	<ul style="list-style-type: none"> • Involving students who are taking a leave of absence. • Using University equipment, even for a fee, in ways not available for use by outside companies. 	<ul style="list-style-type: none"> • Involve current students in your company. • Use University facilities or equipment without a contract. • Not disclose new intellectual property. • Negotiate with Rutgers on behalf of your start-up. • Make decisions for Rutgers involving your company.

D. Use of University Resources

Pending any conflict of interest review, there are opportunities that would allow a faculty start-up to subcontract work and use of equipment in a Rutgers research lab or center. These opportunities are structured as contract requests, which are reviewed and agreed to by Rutgers' Office of Corporate Contracts. Their website and instructions for submitting a proposal can be found at <http://ored.rutgers.edu/corporate-contracts>.

It is important to emphasize that no Rutgers resources should be used related to an outside organization without an approved agreement in place. Agreements will require a statement of work from Rutgers if you plan to use the University as a subcontractor. This process will take time, so reach out to the Corporate Contract Office as soon as possible. IDC/F&A may be required to be included in contract costs.

For those interested in the subcontracting process for SBIR/STTR awards, please view [this flow chart](#).

VI. Identifying and Pursuing Funding for Start-ups

While this is the most sought-after topic from Researchers as it relates to start-ups, the New Ventures team **strongly suggests that all aspects of this Guide be considered first**, before seeking funding. Indeed, investors (as well as non-dilutive grants focused on commercialization, such as the SBIR) want to first see, among other things, strong IP protection, a seasoned management team, a convincing business case/market opportunity, and clear milestones **before putting any money into a venture**.

Below are several funding opportunities. The list is not meant to be exhaustive. Please contact our [New Ventures team](#) with any questions.

A. Rutgers Internal Funding

** Denotes funding **not directed for start-ups specifically**. However, these are intended to be useful resources for faculty considering commercialization of their research.*

- [TechAdvance*](#)
 - Early stage technology development fund to bridge the gap between basic research and the point at which the technology is ready for industry or as a stand-alone start-up.
 - TechAdvance™ offers grants of up to \$100K for a 12-month project.
 - TechXpress™ offers grants of up to \$10K for smaller, 6-month projects.
- [Busch Biomedical Grant Program*](#)
 - The Busch Biomedical Grant program is designed to enhance health-related research at the University and to strengthen the competitive position of faculty members who seek external research funds.
 - The grant supports research projects up to \$40,000 in total for up to a two-year period.
- [Genesis Seed Fund](#)
 - Early stage start-up funding to jumpstart operations and/or commercialization pathway.
 - Eligibility requirements are designed to ensure serious effort, commitment, and business development plan.
 - Up to \$25,000 for qualified startups.

B. External Non-Dilutive Funding

- [SBIR/STTR](#) (Small Business Innovation Research & Technology Transfer Research)
 - Also known as America's Seed Fund, the SBIR/STTR programs provide over \$3 billion in grant funding to small businesses each year. The grants are meant for technologies with **commercialization potential** in all fields of study.
- [NSF PFI: AIR-TT](#)
 - Similar in focus and scope to the SBIR/STTR programs, but must have NSF funding lineage (this includes the NSF I-Corps program).

- [NSF PFI: AIR-RA](#) is a separate but related track for translation of research through partnerships between multiple agencies, institutions, and/or academic fields.
- [QED](#)
 - The QED Program, sponsored by the [University City Science Center](#), seeks technologies in the **life sciences** field with high commercial potential. QED provides business guidance, funding, and access to industry and investor representatives.
 - \$200K grant, half of which is a match by partnering institutions (i.e., Rutgers).
 - Rutgers applicants must review the [Rutgers guidelines](#) before applying.

C. Other External Funding Sources *(dilutive and non-dilutive)*

- [Phase 1 Ventures](#) (P1V)
 - Also sponsored by the Science Center, P1V is an accelerator partnering with academic inventors and institutions, specifically for launching a start-up.
 - Initial seed investment of up to \$25,000.
 - Guidance and help with finding and a business founder.
 - Potential steppingstone for SBIR Phase 1 grant.
 - Subsequent investments possible:
 - Up to \$150,000 in follow-on investment (e.g., to hire researchers, further validate IP); and \$300,000 in a final phase (e.g., manufacturing).
 - Steppingstone for SBIR Phase 2.
- [Foundation Venture Capital Group](#) (FVCG)
 - In conjunction with the New Jersey Health Foundation (NJHF; parent of FVCG), FVCG provides pre-seed and seed funding to life sciences-related companies in NJ.
 - Innovation grants of up to \$100,000 to further the technology (i.e., pre start-up; follow-on grants of \$100,000 possible).
 - Investments of up to \$500,000 in seed capital to launch a start-up.
- The Rutgers NV team partners with other VCs, Angel investors, and institutions.
 - Institutions that sponsor pitch competitions with various prizes (cash or otherwise):
 - [NCET](#), [MABA](#), [BioNJ](#), [AUTM](#), [NJTC](#), [TechLaunch](#), and many others.
 - Some investors sponsor a “Rutgers Day” where select Researchers or start-ups can pitch their technology in hopes of obtaining grants and/or investments.
 - Please contact the [New Ventures team](#) with any questions.

When ready to present to prospective investors, please see Appendix 3 for a “Do’s and Don’ts of Convincing Investors to Bet on Your Technology”.

VII. Appendix

Appendix 1: Start-up Viability and Business Planning

A start-up **may**, or **may not**, be the best commercialization vehicle available for a given technology or invention. For start-ups with significant required capital investment, overhead costs, limited market, or long lead-time to commercialization, a licensing deal with an existing company may be more appropriate.

Start-ups, on the other hand, creates significant value opportunity for the founders and investors of the business. Start-ups also enable the management team to direct a specific business model (whether product specification, targeted customer segment, pace of development) that they think is most attractive.

Researchers need to consider that a **start-up creates additional significant responsibilities**: taxes, legal work, meetings, management, and others. Even with having a seasoned business co-founder, **nurturing a start-up will require some time commitment by the PI inventor. Also consider, that just because you think you have a great technology (and you indeed may), does not mean that you will automatically have access to funding.**

A. Differentiating Good Science versus Good Business

When faculty members consider pursuing a start-up company, it is important for them to make the **distinction** between the value of good science and the market value of any given invention or technology. One challenging question is to ask a researcher to translate his or her work into a vision of a product or service that **specific customers** are willing to buy.

- Indicators of **Good Science** can be predicted by the number of publications, presentations, awards, prizes and research grants.
- Good Science typically leads to new theories, models, laws, systems, equations, and so forth.
- Indicators of **Good Businesses** can include strength of intellectual property (know-how, trade secrets, copyrights, marks and patents), strong management team, wide market opportunity, and long runway for growth.
- Good Businesses lead to customer acceptance, profits, and return on capital.

B. Technology Assessment for a Start-up

As mentioned previously, the development of a technology from a concept into a market-ready product can be very time consuming and expensive. If a technology is too early, creating a start-up to commercialize it may not be feasible. If this is the case, we recommend that faculty seek additional basic or translational research funding to advance their work.

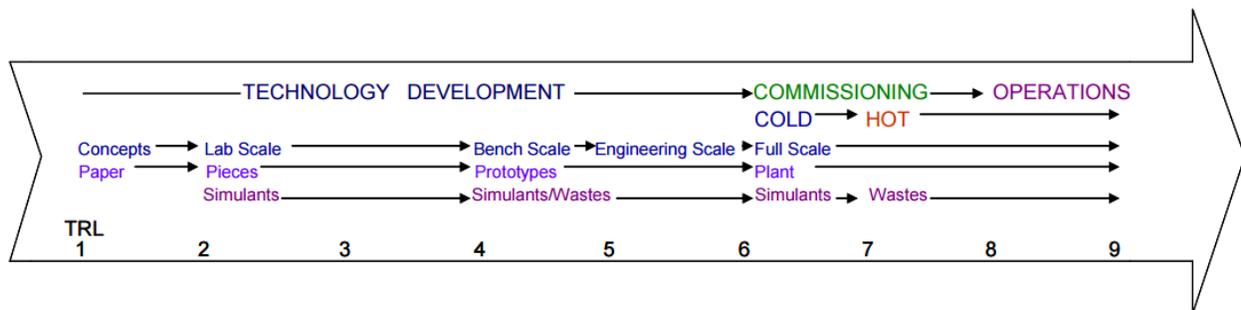
In some cases, sponsored research with existing companies may be a good option. There may also be potential for SBIR/STTR Phase I and FastTrack awards (to SBIR/STTR Phase 2), or a business model that allows for early positive cash flows that can be reinvested into product development.

Key for a technology assessment is to identify what the derived **minimally viable product** would be. **You can then work backwards to assess how much development (funding, resources, time) is required** to get to the final product from where you are currently.

C. Technology Readiness levels *(more applicable for physical sciences and software)*

Technology Readiness Levels (TRL) was designed by NASA in the 1980s as a tool for reducing technical risk and minimizing technology driven cost. It has since been adopted in some form by many government agencies. It is a metric-based assessment scale of the maturity of a technology from concept to fully operational.

- **DOE Technology Readiness Levels Schematic**



[Click here](#) to view a PDF of the scale.

Definitions and descriptions of each level and term is available in [this PDF document](#).

In general:

- Determination of patentability can begin as early as level 2, but not usually till level 3
- Technology assessment for a potential start-up can begin as early as level 4
- Start-ups are usually considered at **TRL 5 or TRL 6**
- SEED stage funding may be available as early as level 6
- VC funding available as early as level 8
- Level 9 – product in the market. Sales data may allow for follow-on funding.

You can calculate your TRL with AFRL Transition Readiness Level Calculator ([Excel Worksheet v2.2](#))

Additional Technology assessment resources:

- NASA's TRL for hardware and software definitions ([1 page PDF](#))
- DoE TRA/TMP 2013 guide ([76 page PDF](#))
- DoD TRA Deskbook ([129 page PDF](#))

D. Target Product Profile (TPP) *(helpful for Life Sciences)*

The Target Product Profile (TPP) is a template that was recommended for adoption by the FDA in 1997 with the goal of improving communications concerning the drug development process. It is essentially a summary of a drug's labeling concepts.

For Rutgers researchers considering a start-up involving a compound or biologic with potential clinical applications, a TPP can help them focus their pre-clinical efforts (help identify which assays and models to use) and assist with any future FDA filings (is part of a proprietary Investigational New Drug file).

Additional Target Product Profile resources here:

- TPP simple worksheet ([1 page PDF](#))
- FDA 2007 TPP Guidance ([25 page PDF](#))

E. Available Courses and Lectures on Start-ups

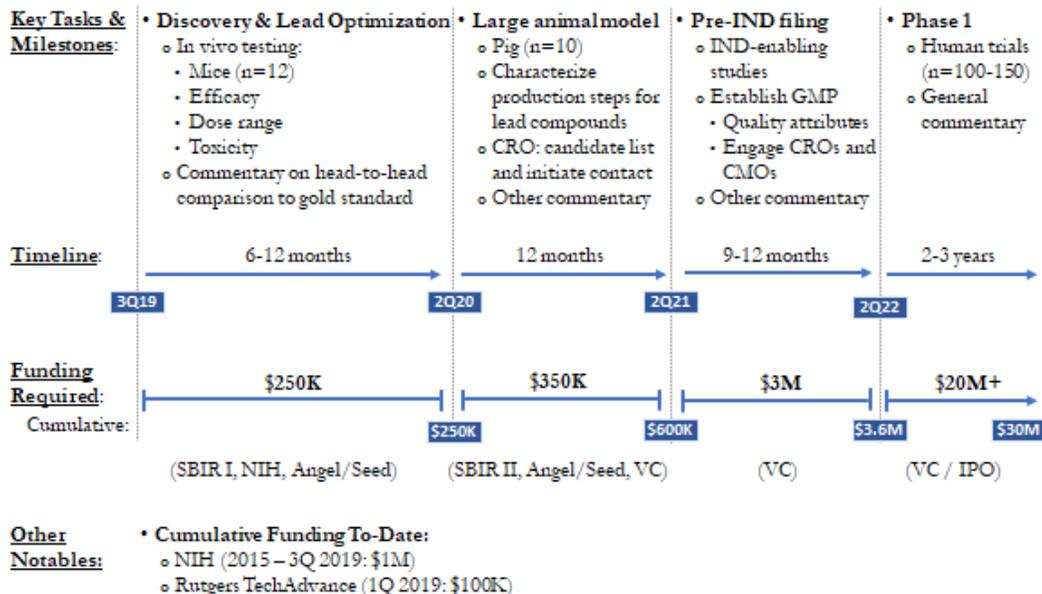
- “How to Build a Startup – The Lean LaunchPad” free course on Udacity taught by Steve Blank. View the course at <https://www.udacity.com/course/ep245>.
- Customer Discovery
 - “How to Do Customer Discovery” <http://vimeo.com/87302754>
 - Pre-Planning: Contacts <http://vimeo.com/87303446>
 - Customer Interview Dry Runs <http://vimeo.com/87302981>
 - Pass/Fail Experiments <http://vimeo.com/87302754>
 - Conducting a Customer Interview <http://vimeo.com/87302479>
 - Looking for Insights <http://vimeo.com/87301695>
 - Death By PowerPoint <http://vimeo.com/76171146>
 - Understanding the Problem <http://vimeo.com/76173388>
- Osterwalder Business Canvas
 - Site with instructions and videos on how to create a business model canvas <http://www.alexandercowan.com/business-model-canvas-templates/>

Appendix 2: Template Investor Presentation (for Life Sciences; for full PPT click [here](#))

- **Slide 1: Cover Page**
 - Title of your technology (or company name) with a 1-line, non-technical description
 - Your name, title, affiliation
 - Other team members name, title, affiliation (if appropriate)
- **Slide 2: Introduction**
 - Elevator pitch / mission statement: a simple paragraph, no more than 2-3 sentences that encapsulates:
 - What your technology is / how it works, in “plain English”;
 - What specific problem it looks to solve;
 - How the technology is unique and superior; and
 - Who actually uses the product (if appropriate).
 - A picture or diagram of your technology is usually helpful.
 - This slide should be crafted for a **generalist / non-scientist**.
- **Slide 3: Problem & Market Need**
 - What is the unmet market need?
 - What is the problem you are trying to solve?
 - What is the estimated market size **specific** to your technology?
 - “We are targeting a \$180B market for oncology” is unrealistic, too broad, and comes across as not being thoughtful.
- **Slide 4: The Innovation – Summary**
 - **Visual display** of your product and service
 - What does it do?
 - How does it solve the market need?
 - **Compare** and contrast to current solutions / current **gold standard**
 - How is your solution unique?
 - What are the advantages?
 - What are the risks and dis-advantages?
 - Typically, a short and small table comparing **key metrics** (no more than 3-4) works well
 - **Avoid saying ‘there is no competition’**. There is always current or future competition, or even substitutive products/services. Presenting to savvy investors that ‘there is no competition’ comes across as uninformed.
- **Slides 5-7: The Innovation – Details**
 - Section to talk in more depth about the technology.
 - For each slide (limit to 3 incremental slides), describe **one specific aspect** or improvement that your technology offers.

- **Slide 8: Current Stage of Technology**
 - What is the IP / patent status, if appropriate.
 - How defensible is your technology?
 - Other than Rutgers, are there other institutions or co-owners of the technology?
 - What is the current stage of technology?
 - i.e., “Where are you today”?
 - For example:
 - “We achieved...”; or “We discovered that...”
 - “We have a working prototype that does...”
 - “Our lead compounds exhibit...”
 - “We are ready to manufacture components of...”
 - “Our customer discovery process suggests...”
 - The more **tangible** your descriptions, the better the investor reception will be
 - This section should include a combination of the above, and serves as a natural segue to the next slide.
- **Slide 9: Goals & Milestones**
 - Near-term **goals**:
 - What are next steps to validate commerciality?
 - For example, additional experiments, customer discovery exercises, etc.
 - Gaps to be addressed with the current round of funding
 - What will this funding help you achieve? (must be a specific goal, not “how will you spend the funds”)
 - What meaningful results do you expect to generate?
 - What aspect of the technology are you de-risking? (for example: toxicity, efficacy, etc.)
 - Outline a multi-year timeline of product/business development to commercialization.
 - What key research needs to be done at each stage?
 - How do you define each stage (milestone-based)?
 - **Given the difficulty faculty (especially in the Life Sciences field) typically have with this slide, please find below an example slide. This is a general template and ALL numbers and comments are no more than placeholders. (slide on next page)**

Development Timeline & Funding Requirements



- **Slide 10: The Ask**

- What amount of funding are you seeking?
- How specifically will you be spending the funds?
- Break out **use of funds by milestones**
 - Even if investors commit to funding, for early-stage start-ups, disbursement is typically staggered and depends on achieving stated milestones.
- Try to include an “exit path” for investors: how will investors ultimately make a return?
 - Are there large companies that would be interested in acquiring/licensing the tech?
 - Is this a company that could go public (IPO)?

- **Slide 11: The Team**

- Include pictures of team members, if appropriate
- Highlight skillsets that are complementary
- An ideal team would have: Scientific expertise, Clinical expertise, Commercialization expertise (very few teams will have the full suite of expertise at an early stage).

- **Slide 12+: Thank You and Appendix**

- Always include a Thank You note or slide.
- You could include an Appendix section with further details on the technology.

Appendix 3: Getting Ready to Pitch to Investors ([link to full PDF](#))

The do's and don'ts of convincing investors to bet on your technology

Do's	Don'ts
<ul style="list-style-type: none"> Remember that investors' main goal is to maximize their Return-on-Investment. Show them you understand that. Show them you realize that while in your world it's 'all about the data', in the investment world it's about both, the data and financial upside. 	<ul style="list-style-type: none"> Don't come across as being 'in love' with your technology, even if you are. No matter how interesting or fancy your technology is, if it will not make money, investors will not invest. And the more in love you are with your technology, the less likely you are to listen to constructive criticism that may help make it commercially successful.
<ul style="list-style-type: none"> Be a good listener. While investors may not know your technology as well as you do, they usually have much more experience in commercializing technologies. Even though you feel/know that no one understands your technology and its potential as well as you do, go into the meeting with the mindset that investors know what they are talking about when they ask tough questions. They usually do. 	<ul style="list-style-type: none"> Don't argue with investors. Address their questions calmly and to-the-point. The goal is to answer their questions, so they feel more comfortable and more likely to invest in your technology. The goal is NOT to show them that you are smarter (even if you are). If you need to disagree, make sure you do it in a way that does not make you disagreeable.
<ul style="list-style-type: none"> Constantly keep in mind that investors are evaluating you as a person, not just your technology. During your presentation and Q&A, investors subconsciously ask themselves 'Would I be able to work effectively with this researcher for the next several years? Would I enjoy working with this researcher?' 	<ul style="list-style-type: none"> Do not alienate investors with a 'know-it-all' attitude. Since investors are constantly and subconsciously evaluating you as a potential partner, try to build chemistry with them. Don't be negative and don't be argumentative.
<ul style="list-style-type: none"> When you first start explaining your technology, use words and terms that even your grandmother would understand. Be concise. Then let the investors lead you with their questions into the 'nuts and bolts' of your technology. 	<ul style="list-style-type: none"> Don't start explaining your technology in a complicated way and using terminology that only people in your field understand. It will likely make investors uncomfortable and may even cause them to become subconsciously antagonistic.
<ul style="list-style-type: none"> If you pitch as a team, make sure that the team comes across as a cohesive and productive group. Support each other during the presentation and demonstrate that the team is synergistic and delivers more than the sum of its members. 	<ul style="list-style-type: none"> If you pitch as a team, don't contradict or argue with your team members in front of the investors. Investors prefer to invest in a cohesive team and not in a disjointed one. A disjointed team raises a red flag as to its ability to work productively.
<ul style="list-style-type: none"> Always mention the current and potential competition. It demonstrates that you know the territory you are operating in, and therefore less likely to be surprised and more likely to commercialize the technology in a competitive way. 	<ul style="list-style-type: none"> Never say 'there is no competition'. There is always current and/or future competition. Saying to savvy investors that 'there is no competition' comes across as naïve and uninformed.
<ul style="list-style-type: none"> Tell a story, not just cold facts and figures. Investors use both their brains and their guts when making investment decisions. A compelling story about your technology/startup sets the gut to move the brain in the right direction. 	<ul style="list-style-type: none"> Don't prepare an investor presentation like a grant application. It is more important to weave a credible and investable 'story' than to cram all the technical facts and data into a sprawl of slides.
<ul style="list-style-type: none"> Do dry-runs of your presentation. Remember that 'practice makes perfect'. Practice presentations in front of people who can provide constructive input regarding the content, as well as the delivery, of your pitch deck. This will make your interaction with investors more effective. 	<ul style="list-style-type: none"> Avoid walking into an investor meeting unprepared. You have only one chance to make a 'first impression'.