

FLC LEARNING CENTER

## NIH Startup Challenge Model

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Federal technology transfer offices (TTOs) are increasingly motivated to proactively market federal discoveries and inventions to commercialization partners. These same TTOs face unique challenges in steering federal discoveries on a path to commercialization:

- regulations preventing federal inventors from forming companies;
- agency missions that differ from financial drivers of industry;
- a perception that government can be difficult to work with.

So what better way to address a challenge than to create one? A startup challenge that is; one that can mobilize multiple parties to put forward their best business plans and ideas for the opportunity to form a startup company centered around a federal invention.

In 2013, the National Cancer Institute (NCI), in partnership with the Center for Advancing Innovation (CAI), created a startup challenge model as a new way to move promising, early-stage NIH technologies to the market. Later that year NCI, CAI and a philanthropic partner, the Avon Foundation for Women, launched the Breast Cancer Startup Challenge (BCSC) – a first-of-a-kind, international, university-based competition. The idea arose from the need to address a fundamental problem: Since NCI technologies are typically very early stage, potential partners – generally large biomedical companies – are reluctant to form partnerships around early-stage discoveries because of lengthy developmental timelines and high financial risk. The BCSC

***The Startup Challenge Model is a technology transfer strategy with potential to help simultaneously advance multiple federal inventions from discovery to commercialization.***

was created to address this problem, focusing on creating startup companies to help develop and commercialize inventions. CAI, a nonprofit, together with NCI, analyzed the NCI patent portfolio and selected nine promising breast cancer-related technologies suitable for commercialization by startups. NCI and CAI designed a challenge framework targeted to university students, requiring the formation of multidisciplinary teams that included at least one seasoned entrepreneur and a mixture of students majoring in business, law, medicine, science, engineering, and computer science. Once accepted into the BCSC, teams created business plans to develop and commercialize NCI inventions. In March 2014, 12 challenge winners were announced, and finalists worked to incorporate their startups, raise funding and negotiate with the NIH Office of Technology Transfer for a license to their selected technology.

In view of the promising results from the BCSC, NCI and CAI applied the model to a second challenge in September 2014: the [Neuro Startup Challenge \(NSC\)](#). The NSC centered on 16 neuro-related inventions from multiple NIH Institutes and included a different philanthropic partner (the Heritage Provider Network); winners were announced in May 2015. Collectively, the BCSC and NSC provided 25 NIH technologies, created 34 startups and trained over a 1000 entrepreneurs. A third challenge, [Nanotechnology Startup Challenge for Cancer \(NSC<sup>2</sup>\)](#), centered on commercially viable nanotechnology cancer-related inventions. This challenge was launched in October 2015, and the winning startups were announced in July 2016. Beyond NIH, CAI partnered with NASA to launch the “[SPACE RACE](#)” in October 2015; the winners were announced in November 2016.

These challenges were designed to help advance development and commercialization of multiple NIH inventions, and created a new model with potential application to advance other federal inventions, through a public/private partnership and framework:

- a federal partner supplies technologies suited for commercialization by startups;
- a private-sector partner provides expertise and resources to manage and execute a challenge, and support and mentorship for teams;
- a philanthropic partner, working exclusively with the private-sector partner, provides challenge funding.

For each challenge, the private-sector partner assembled a team of judges with diverse, relevant industry expertise, finance, the federal government, nonprofit, and investment organizations. The

judges evaluated the participating challenge teams' business plans and sales pitches. Some judges also served as challenge team mentors.

## *How It Works*

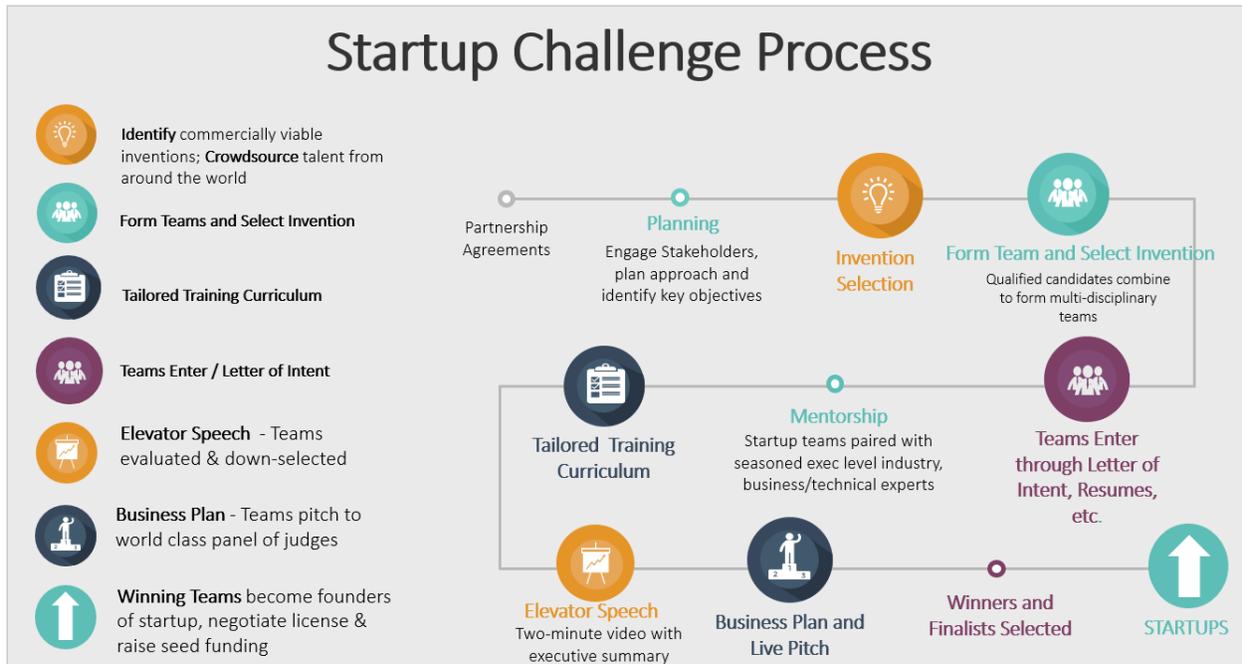


Figure 1. Startup Challenge Process

## *Results*

### *Breast Cancer Startup Challenge (BCSC)*

- METRICS
  - 10 inventions offered in challenge (9 NCI, 1 Avon Foundation)
  - 46 teams competed
  - 12 startups created
  - 460 entrepreneurs trained
  - 1 active startup as of October 2016
- NOTABLE RESULTS
  - Successful startup:
    - Oncolinx: Winner of several competitions post-BCSC, including \$1M prize winner of 43North competition. Featured in Forbes. In Phase 1 development

and actively conducting research. Team has raised more than \$2M and is working collaboratively with the NCI inventor

- General Accomplishments:
  - Created new model to advance federal inventions
  - Provided unique opportunity to train next-generation of scientist-entrepreneurs
  - Winner of HHS Innovates Award; Challenge.gov: “Best in Business Plans/Entrepreneurship”; Federal Laboratory Consortium (FLC) Mid-Atlantic Region Excellence in Technology Transfer Award; Highlighted by the White House

### *Neuro Startup Challenge (NCS)*

- METRICS
  - 16 inventions offered in the NSC (3 NCI, 1 NIDA, 3 NICHD, 1 NIA, 7 NINDS, 1 NINDS/NIST)
  - 71 teams competed
  - 22 startups created
  - 720 entrepreneurs trained
  - 13 active startups as of October 2016
- NOTABLE RESULTS
  - Successful startups:
    - Angio360 Diagnostics - Team has raised \$72K
    - AngioClast - Team was finalist at Oxford BioStars and at Pitch@Palace by Mass Challenge
    - Cogentis Therapeutics - Team has received a scholarship from Cydan Development, an orphan drug accelerator. Named one of the “Most Promising Startups” Mass Challenge.
  - General Accomplishments:
    - Neuro Startup Challenge featured in InformationWeek
    - Neuro Startup Challenge highlighted by the White House
    - Featured in “Profiles In Success” by Bernhardt Wealth

## *Nanotechnology Startup Challenge in Cancer (NSCC)*

- METRICS
  - 12 inventions entered in challenge (5 NCI, 1 NHLBI, 2 NIBIB, 4 third-party inventions)
  - 29 teams competed
  - 10 startups created
  - 510 entrepreneurs trained
  - 10 active startups as of October 2016

### ***Feedback From Startups Created as a Result of a Startup Challenge***

#### *Entrepreneurship*

MotionCorrect - “Before entering the Neuro Startup Challenge during 2014, my co-founders and I had never met each other before, and I had never created a company from scratch. Since then we have worked hard together to nurture a new startup, and we have met great people at local hospitals and research center hoping to make a difference. Our team has learned about the importance of customer validation from our mentors, observed MRI examinations first hand, and formulated an innovative business strategy. Our team benefited greatly from this opportunity and I would encourage fellow aspiring entrepreneurs to join the next cohort. Good luck everyone!”

#### *Networking*

RNAissance - “We particularly enjoy the plethora of webinars on all aspects of business development, which have turned the competition into a highly immersive experience. The opportunities to directly reach out to the speakers and discuss our individual concerns greatly accelerated our efforts. Likewise, having been able to engage with stakeholders such as clinicians, pharma representatives, and policy makers provided us with invaluable insights into desirable features of novel therapeutics.”

#### *Academic*

EncepHeal - “The Neuro Startup Challenge originally offered us an avenue to learn of Biotechnology and Small Businesses through a hands on experience. We were able to apply our different backgrounds to start a business. However, by the end, the challenge offered us something so much more. With their mentoring and relationships, the Neuro Startup Challenge gives EncepHeal Therapeutics the

opportunity to help over 22 million people affected by substance abuse, many of which, do not have options when it comes to FDA treatments.”

### ***Lessons Learned***

- Require competing teams to have at least one seasoned entrepreneur, at least one member with a background in the industry related to the invention, and a minimum of three members on the team.
- Require winning teams to provide feedback and regular progress reports for 2-3 years post-competition.
- Include a robust training and mentorship program (an accelerator) that teams are required to complete. This program should include training on the licensing process for your agency and may also include training in business plan development, delivery of marketing and fundraising pitches, and understanding of intellectual property. This training program serves as a high-value, non-monetary incentive for teams to participate.
- When agencies consider issuing a license to a startup challenge winner, they should consider developing licensing terms supportive of a startup company, and should be prepared to work with entities that may have little experience and funding.
- It is important to recruit numerous judges to ensure coverage at all stages of a challenge and to minimize the time commitment of the volunteering judges.
- Winning teams should maintain a high engagement with advisors and other supporters throughout the challenge. These supporters can be great resources to the startups in the future.
- Funding is a critical factor for firmly establishing the startups. Therefore, the federal lab should consider more funding as part of the Challenge award for future startup challenges.

### ***Conclusion***

Because the desired outcome of a startup challenge is the creation of startups, the challenges offer the potential to make an economic impact. The training provided helps accelerate translational research, development and technology commercialization, and provides an opportunity for students to prepare business plans around relevant inventions with advice and mentorship from industry executives. NCI realized that the startup challenge model can offer a unique opportunity to obtain an additional market perspective and valuable feedback about federal inventions and their current development needs.

There is potential for other federal agencies to adapt a startup challenge model to their needs and utilize it as another tool to spur invention commercialization. The entrepreneurial training and engagement of industry mentors in a startup challenge can facilitate new bonds that connect industry and the research community – enabling more effective technology transfer. The potential positive outcomes support the national initiative to advance important technologies from the government labs to the public benefit.

### ***Startup Challenge Websites***

- [Breast Cancer Startup Challenge](#)
- [Neuro Startup Challenge in Cancer](#)
- [Nanotechnology Startup Challenge in Cancer](#)
- [Space Race](#)

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### *Notice*

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