

Competition aims to revive languishing breast cancer inventions

The US National Cancer Institute's massive portfolio contains roughly 1,800 inventions, but many of those new therapies and technologies aren't improving the lives of patients with cancer. Ethics rules prevent NCI researchers from launching companies to develop new products, and existing biotech firms often aren't willing to take risks on such early-stage research. In an effort to propel more of those inventions out of the lab and into the clinic, the NCI partnered with two nonprofits—the Avon Foundation for Women, the philanthropic arm of the New York-based beauty company, and the Center for Advancing Innovation (CAI), a public-private partnership aimed at advancing technology transfer—to launch a competition aimed at identifying entrepreneurs eager to develop these therapies and devices for women with breast cancer.

“You have these promising inventions, but there's nobody who wants to license them,”

says Rosemarie Truman, founder and chief executive of CAI, which is headquartered in Leesburg, Virginia. “So I came up with this plan to launch a business plan and start-up challenge.”

The so-called Breast Cancer Start-up Challenge, which kicked off in September 2013, features ten inventions—nine from the NCI patent database and one invention funded by Avon—including cancer diagnostics, immunotherapies, drug delivery platforms and more. To enter the challenge, participants had to select one of the ten inventions, form a team and submit a letter of intent. The challenge attracted the interest of about 200 teams, but only 46 met the contest's requirements. Each team had to include at least three students and one seasoned entrepreneur, as well as individuals with medical, legal and business expertise.

On 5 March, Truman and her fellow contest organizers announced which teams—one per invention—would receive a \$5,000 cash prize from Avon in the second phase of the competition. The teams that complete the third and final phase will be asked to launch a start-up company, raise seed funding and negotiate a license agreement. Any group that manages to accomplish these tasks will be considered a winner. Although the winners aren't guaranteed a further cash prize, CAI has put together a group of funders, including venture capital and investment firms, that have agreed to evaluate the winning companies and potentially invest between \$100,000 and \$10 million per start-up.

That should give winning teams an advantage in the funding arena, notes Christy Shaffer of Hatteras Venture Partners in Durham, North Carolina, one of the seed funders participating in the challenge. “If someone calls us cold and we don't have a relationship, they're going to be among several hundred other companies that we're going to be evaluating,” she says. But the winners of the challenge “have been filtered through a rigorous process. We know that they're the best of the group.”

Getting competitive

According to Truman, other entrepreneurship contests exist, but few focus exclusively on the life sciences, and organizers typically rely on contestants to source their own inventions. This contest “allowed us to focus on our inventions and stimulating start-ups around them,” says Thomas Stackhouse, associate

director of NCI's Technology Transfer Center. “It's taking a more proactive role than we have in the past.”

The ten inventions featured in the Breast Cancer Start-up Challenge are ideas looking for champions. One of those inventions, for example, is a class of toxins derived from anti-tumor molecules called azonafides. These toxins could be attached to an antibody or small molecule designed to target cancer cells. In one unpublished study, researchers treated lung cancer cells with either the antibody therapy Herceptin (trastuzumab) or trastuzumab linked to one of these toxins. Herceptin alone destroyed only 46% of the cells, whereas the toxin conjugate killed off nearly 99% of the cells, says Nadya Tarasova, a chemist who came up with the invention at NCI about a decade ago. Many toxins exist, but most lack the capacity to attach to antibodies that target cancer, according to Tarasova. Over the years, she has received a few inquiries about her toxin, “but they didn't really go anywhere,” she says. Tarasova might have developed the idea herself, but scientists employed by the US National Institutes of Health are prohibited from holding stock in pharmaceutical or biotech companies or receiving compensation from them.

Only about half of the inventions in NCI's portfolio have been licensed, which is a shame, according to Truman, who calls them an “awesome deal.” The National Institutes of Health offers small start-ups exclusive licensing agreements that require only \$2,000 up front and royalty payments of just 1.5% of revenues. There are no additional payments until a company has a ‘liquidity event’ such as an initial public offering on the stock market.

Those moving ahead in the competition say that the real reward of participating in the challenge is the exposure to increase their chances of capitalizing on the NCI inventions. “One of the most valuable things I think [the contest] gave us is credibility,” says John Kuelper, a contestant from Northwestern University in Evanston, Illinois, and a member of one of the winning teams. “When we reached out to mentors, I think they were much more receptive than they would have been if we were just a random group of students trying to launch a business.”

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Tianbo Han/Innovation Factory

Prize plan: Truman pitches the competition.

Corrected after print 28 March 2014.

Correction

The March 2014 news article "Competition aims to revive languishing breast cancer inventions" (*Nat. Med.* **20**, 223, 2014) did not specify that the Center for Advancing Innovation coordinated the fundraising effort and inaccurately implied that NCI has 1,800 patented inventions in its portfolio. In fact, some of those inventions are not patent protected. The errors have been corrected in the HTML and PDF versions of the article.
