Work

Your story

Send your careers story to: naturecareerseditor@nature.com

GETTY

HOW TO ENTER AND WIN SCIENCE COMPETITIONS

Innovation challenges offer valuable lessons and resources for researcher-entrepreneurs.

Public and private institutions around the world are making use of science competitions to tap the brains of international talents. For the most high-profile contests, such as the 'Feed the Next Billion' challenge from the XPRIZE foundation and the Earthshot Prize, awards can run into millions of dollars — a life-changing amount for aspiring researcher-entrepreneurs.

Nature spoke to contest organizers, investors and winners about their take-home messages, tips for emerging victorious and ways to use competitions to get a head start in innovation and entrepreneurship.

LIANNA GENOVESE
THE WINNER

When I was a biomedical and mechanical engineering undergraduate student at McMaster University in Hamilton, Canada, I won the Canadian National James Dyson Award 2021 — which aims to inspire university-level students to solve societal problems using engineering designs. My winning idea was an assistive medical device that enables individuals with limited hand mobility to write, draw and use a touch-screen device. This project started in my first year after I met and was inspired by Elissa James — a talented painter with cerebral palsy. After we met, her condition had deteriorated to the point where she needed help to continue painting: so I started thinking about what device I could develop.

The Dyson competition pushed me to think hard about my designs. I knew that I was up against other talented inventors, and to have a chance of making a real-world impact (one of the judging criteria), my design had to be ergonomic. Over the past three years, the design of my device has gone through six iterations, and I have had multiple consultations with health-care professionals and people with limited hand mobility. From the first prototype,

made of sponge, straws and pipe cleaners, I now have a product, named Guided Hands, on the market. We've sold 64 devices so far.

Winning the competition significantly enhanced the publicity of my start-up company. On the day the result was announced, there were more than 1,000 visitors to my company's website, and over the next 3 months the traffic remained high. I didn't have the expertise, time or money for lots of marketing, but as a winner I could now ride on Dyson's marketing effort and channel my own precious resources into building other aspects of my business, such as hiring staff and prototyping.

Most importantly, as the winner of a prestigious competition, I know that my innovation gained immediate credibility. The people we aim to reach and their caregivers are also more willing to try our product and give us feedback, which we can use to improve our design.

I would advise researcher-entrepreneurs to first apply for a patent to legally protect their ideas before entering science competitions. However, finding contests and entering them can distract from other aspects of having a start-up. Time is often short, especially when you're applying to take part in competitions: many require extra information and reports, which might take focus away from the day-to-day operations of a business. But overall, I'd say for me the time investment has been worth it.

Lianna Genovese is chief executive and founder of ImaginAble Solutions in Hamilton, Canada.

TING YAN LECK
THE INVESTOR

As an investor, there are a few key factors I look for before investing in an idea or start-up. The first is how well the product fits the market, taking into consideration who the specific user of an idea or technology is going to be, the challenges faced by that user and the advantages of the proposed technology over existing solutions.

The technology itself is therefore only one of many considerations. Yet, when researcher-entrepreneurs pitch to investors, they often focus on how useful their technologies are, at the expense of other important points. I once listened to a pitch from a team of engineers about how their data server design could help to improve heat circulation and reduce server temperatures. But the team didn't know how purchasing of servers in data centres works, and how frequently data centres change their servers. The pitch was unsuccessful: they needed more awareness of how the product could work in the wider business context.

Science competitions are helpful because they typically force participants who want to succeed to consider commercial viability at an early stage of their business, before they seriously engage investors. This is how innovation begins — when a real problem is properly defined. I have volunteered as a judge, mentor and speaker at innovation challenges and have experienced first-hand that competitions can train researcher-entrepreneurs to become more creative and sharper in shaping narratives around their business ideas.

Start-ups should be aware that competition organizers might look out for different winning factors. In competitions organized by big companies with established marketing and sales teams, more attention is given to the core of the technology, whereas in smaller scale competitions, the technology and business plans usually have equal weighting. Start-up founders must also balance participating in competitions and building their companies: there are advantages to participating, but each competition takes time away from the core business, which should remain the main goal.

Ting Yan Leck is a partner at TRIVE Venture Capital, Singapore.

ULRICH BETZ
THE BUSINESS PERSON

The Merck Innovation Cup brings graduate students and postdocs from around the world into our pharmaceutical company for a week. They develop innovative ideas and business plans to solve unmet medical needs with support from experienced professionals. We've been running the competition since 2011. Once in the programme, the participants are selected on the basis of innovative ideas they submit, and then grouped in teams of five, and mentored by an alumnus of the challenge. The participants then decide which of the submitted ideas they wish to pursue over the week to win the grand prize of €20,000 (US$22,700).

Joining competitions can be a useful way for researcher-entrepreneurs to learn what appeals to investors and companies — training that many academic researchers lack. We select winners on the basis of four criteria: innovativeness, probability of success, alignment with the company's focus and the team's performance in pitching. Participants have told me they've become more confident working in science and business after taking part.

In my opinion, the best outcome of a science competition is the building of collaborative spirit and camaraderie. Unlike many competitions, in which organizers end their interactions with participants after the main event, the Merck Innovation Cup tries to maintain links after the competition. We continually connect with alumni on social media and invite them to alumni symposia. We sometimes also offer participants a chance to join us as paid consultants, or to be involved in our research projects as industry postdocs or academic collaborators when we wish to further develop the winning ideas in Merck.

Over the years, we have had alumni go on to become successful academic scientists, company managers and entrepreneurs. The networks that the participants create with each other during the competition are useful to tap into throughout their careers. Recently, I also learnt that a winning team from 2020 decided to create a bioelectronics start-up, INIA Biosciences, that aims to use ultrasound to interact with the immune system to relieve chronic inflammatory diseases.

More companies and foundations are seeing the advantages of science competitions and are organizing innovation challenges. The organizers benefit from recruiting talented people, gaining fresh ideas and promoting an image of innovativeness. The participants are rewarded with training, network building and prize money. In addition to the Innovation Cup, we also organize events such as the €1 million Future Insight Prize, which is given out annually to honour and enable scientists solving key challenges of humanity.

Ulrich Betz is vice-president of Innovation at Merck, Darmstadt, Germany.

Lianna Genovese won the Canadian National James Dyson Award in 2021.

JAMES DYSON TEAM

MARJOLEIN CROOIJMANS
THE JUDGE

iGEM (International Genetically Engineered Machine) is a science contest in which approximately 350 international teams compete annually using synthetic biology to solve societal challenges. I competed in 2018, and the positive experience motivated me to continue as a judge and mentor from 2019. iGEM teams identify problems unique to their region, such as rising sea levels in the Netherlands, or global problems such as antibiotic resistance, and come up with innovative solutions. The team I mentored was the overall winner for the 'Overgraduate' category in 2020. The researchers' project, called Rapidemic, aimed to develop a point-of-care diagnostic tool for future infectious diseases.

iGEM has been successful in training researcher-entrepreneurs. There have been at least 175 start-ups based on iGEM projects, and we track these companies and publish updates on them in quarterly reports. Some of the more successful companies include Ginkgo Bioworks in Boston, Massachusetts, which produces industrially useful bacteria, and Opentrons, in New York City, which develops robots to automate biological experiments.

Many participants develop strong ownership of their ideas after iGEM and wish to see these ideas to fruition, but they might not get enough support from their academic institutions. That's why two years ago, we started the Entrepreneurship Program Innovation Community (EPIC), which has an international committee of 21 members. After iGEM contests, if participants wish to further develop their ideas into start-ups, they can apply to EPIC, which aims to link participants with mentors from their local regions, as well as providing training programmes on how to write business proposals and pitches. Although we do not yet provide direct funding, we have an extensive network of entrepreneurs and business people, and we aim to provide connections to top-tier early-stage investors and accelerators around the world.

In my opinion, the most important reward from entering a science competition is gaining early insights into problems that our society will face in the future. Some of these problems are local challenges now but have the potential to eventually affect the entire world. Building and being part of a community of like-minded, talented people from around the world can help us to generate creative solutions.

Marjolein Crooijmans is chair of iGEM EPIC, Cambridge, Massachusetts and a PhD Student at Leiden University, Leiden, Netherlands.

HUICHAN ZHAO
THE ACADEMIC

I was one of 10 winners selected as a 2021 DAMO Academy Young Fellow out of 365 applicants. The award, which comes with a prize of 1 million yuan (roughly US$158,000), is organized by Chinese technology giant Alibaba each year to promote scientific and technological innovation by encouraging young Chinese researchers to embark on socially impactful projects. The prize money can be used for various purposes, including laboratory renovations, hiring staff and embarking on research according to the needs of the award winner.

After receiving the prize, there was tremendous interest from investors and people in the industry to translate and bring my technology to market. My research is in the field of soft robotics — robots that have gentle, dexterous components, which have huge potential in areas such as rehabilitative medicine and manufacturing. Specifically, my lab is developing soft materials for use in prosthetics and artificial muscles.

For now, my preference is to continue working in the lab; I don't have concrete plans to commercialize my technology. Nevertheless, the enhanced visibility is great. I get to expand my networks beyond my typical academic circle. In the future, these connections will be helpful when my students and I consider entrepreneurship. And because the award comes from an internationally recognized company, this might attract more interest from talented collaborators and students abroad.

A piece of advice I have for people trying to win science competitions is to have a supportive network that includes people from your professional and social circles. For this award, I submitted two letters from my mentors, who are pioneers in my field. Their support probably convinced the selection committee of the potential impact of my research. I also practised my presentation to my family multiple times. This can be helpful because there are often non-experts on the award panel, and you should pitch your presentation at a level suitable for them.

Your family members will also be your strongest critics, which is useful. My family were not shy in telling me what part of my presentation was dry or where I needed to explain myself better.

Huichan Zhao is an associate professor at Tsinghua University, Beijing, China.

Interviews by Andy Tay.
These interviews have been edited for length and clarity.