

CAREERS

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CROWD-FUNDING

Cash on demand

With careful planning and tuned expectations, researchers can supplement their project support with donations from the public.

BY KAREN KAPLAN

Gregory Vaughan celebrated when his team won a 2-year, 308-million-peso (US\$168,000) grant from the Colombian government to study the Andean crop achira (*Canna indica*). The plant is mostly ornamental now, but native South Americans once cooked its tubers for food. The researchers wanted to know more about its nutritional value, whether they could re-introduce the ancestral way of cooking and whether the plant could be used to supplement or replace purchased rice, potatoes and animal feed.

But Vaughan, a contract researcher in agronomy at the Pedagogical and Technological University of Colombia in Tunja, discovered early this year that he was missing something. In his grant application, he had forgotten to include funds for nutritional analyses on

several varieties of *C. indica*. "It's not that big of an experiment, but it will end up being pretty expensive," says Vaughan. "We don't have the budget to do those tests, and without them, we won't get the data we need."

Vaughan calculated that the team needed about 2.7 million pesos, or \$1,500, to complete the testing. The plants' growth cycle meant that they had to be harvested in March, and the tests had to be done immediately thereafter, so the team needed money quickly. Rather than tackle another grant proposal, Vaughan decided to turn to crowd-funding: asking members of the public to donate to the project. "I'd read about people who needed expensive medical procedures and were able to get them paid for," he says. Ultimately, he chose to make his appeal through Indiegogo, a crowd-funding website that hosts a variety of campaigns related to science, medicine and technological

development among other projects, and which he found accessible and easy to browse.

The campaign was open to donations for about two and a half weeks. In that time, it raised more than \$2,000 — surpassing its goal by one-third. The team is now able to complete its tests and, with the surplus money, is creating a fund to support economic-development projects based on *C. indica*.

ONLINE PHILANTHROPY

Vaughan is one of a growing number of researchers seeking crowd-funding. The practice has exploded in recent years, especially as success rates for research-grant applications have fallen in many places. Although crowd-funding campaigns are no replacement for grants — they usually provide much smaller amounts of money, and basic research tends to be less popular with public donors than ▶

► applied sciences or arts projects — they can be effective, especially if the appeals are poignant or personal, involving research into subjects such as disease treatments.

Scientists taking this route can increase their chances by making the most of outreach and social-media marketing or partnering with someone who knows the ropes. Campaigners must be able to present proposals that tantalize non-scientists. And although savvy campaigns have the potential to bring in crucial funds, users should have realistic expectations.

Once a researcher or team decides to seek funds to support a project, they need to identify a target amount — seasoned campaigners recommend that novices go for less than \$5,000 at first — and choose a platform, often an existing website that already gets a lot of traffic or press, such as Indiegogo, Kickstarter, RocketHub or Funda-Geek (see *Nature* 481, 252–253; 2012). The most useful platforms have broad, flexible criteria for hosting a project and take a short amount of time to accept or reject a proposal. The campaign will usually last from between a few days to a few months, depending on the amount sought and the site's requirements. Campaigners should check how much sites charge to host projects — fees can range from 2–4% of total donations for an appeal that meets its goal to more than 10% for one that falls short. If a project doesn't meet the goal, some sites require that the campaigners refund all the donations. The aim is to discourage campaigners from seeking unrealistically large sums, and to mitigate the chances that a campaign will languish on the site for months.

The platform will provide a home page for the appeal, and what goes on that page is crucial to the success of the campaign. The text should describe the project in a compelling way that is easily understood by a lay audience, and the page should also include photos and at least one video. It should be updated at least every few days, with information about what the research team has discovered or produced, or what it is working on, to ensure that the campaign remains dynamic and compelling. Scientists who are not media savvy should get help or advice from someone with a grounding in web design and social media, says Danae Ringelmann, founder of Indiegogo, which has offices in Los Angeles, California, and New York. "Get a good intern," she advises.

Crowd-funding is inextricably linked to



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Danae Ringelmann

outreach, says Jai Ranganathan, an ecologist at the University of California, Santa Barbara, who co-founded #SciFund Challenge, a crowd-funding site targeted to scientific projects. At least six months before launching a crowd-funding campaign, scientists should begin blogging and tweeting about their research; creating a Facebook page and posting updates about their work; and uploading videos to the blog, Facebook and YouTube. "Engage the networks you have — 'Hey, I'm doing this thing,'" says Ranganathan. "Let your network know: use every channel you've got." Once they have launched the crowd-funding campaign, he adds, researchers should step up their outreach using social and even conventional media outlets: he recommends sending out short press releases and calling newspaper and magazine editors and bloggers. "Two things matter — the size of your existing audience and their commitment," he says. "You have to build the crowd."

"We did an all-out media bonanza blitz," says Will Ludington, a molecular and cell biologist at the University of California, Berkeley, and co-founder of uBiome, a citizen-science startup that sequences the genomes of the microbes in customers' bodies. It uses the results to look for correlations between microbiome composition and human health, lifestyle, diet and behaviour. The company ran a successful campaign on Indiegogo to get support for the sequencing research and funding for the citizen-science platform. It sent out hundreds of press releases to media outlets and cold-called reporters, editors and bloggers. The approach worked — the campaign was featured in technology magazines including *Wired*, as well as local publications. uBiome raised some \$350,000 in three months — 3.5 times the goal and more than enough to support the team's sequencing research and start-up.

THE ART OF PERSUASION

Most crowd-funding campaigns include rewards to encourage people to donate. uBiome, for example, sent people who gave \$79 a kit to take a sample of their microbes, which they could send back to the company for sequencing. Different incentives should be offered for donations of varying amounts. "Any donation above \$20 gets a shout-out on my blog — 'So and so is a devoted grade-school teacher and preserver of antiquities,'" explains Vaughan, adding that the donors will also be acknowledged in his study when it is published. For \$500 or more, he says, he will give a donor a guided tour if they visit Colombia.

Of course, crowd-funding should not be viewed as a substitute for peer-reviewed grants. It involves no rigorous merit review, so research that it supports might not carry the same weight with the research community, including tenure committees, journal editors and reviewers of future grants, says Maria Zacharias, a spokeswoman for the US National Science Foundation in Arlington, Virginia.

Furthermore, she adds, grants from funding agencies generally provide multi-year support, not the one-time bounty of crowd-funding.

"Crowd-funding works best as a top-up," says Simon Vincent, head of personal awards funding for the charity Cancer Research UK in London. "It is an add-on, a new way of getting public engagement."

Many campaigns require a great deal of effort to reach their goal, as Hagop Panossian, an engineer and president of the Analysis Research and Planning for Armenia (ARPA) Institute in Tarzana, California, discovered. In February, he launched a campaign on Indiegogo to raise \$25,000 for a DNA sequencer, training and materials for researchers in Armenia. "This is a learning process for us," says Panossian.

To pass on information about the campaign, he posted a link to it on ARPA's website and e-mailed 6,500 contacts every few days with updates and appeals. His son tweeted about the campaign's progress, and helped him to produce a video and post it on the Indiegogo page.

Panossian managed to raise \$27,515, but concedes that it was touch and go, in part because he could not extend his deadline under Indiegogo's regulations for 'fixed-funding', or fixed-target, campaigns. It is not easy, he admits, to get people

to pay up for a DNA sequencing machine. "If you're raising funds for things that appeal to people's hearts, like orphans, it's much easier to get them to donate," he says.

Even the spectre of cancer does not always open wallets far enough. Liz Scarff, a social-media strategist based in London, and co-founder of digital-communications agency Fieldcraft, ran a four-month



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Gregory Vaughan

Indiegogo campaign called iCancer to raise \$2 million on behalf of a Swedish team seeking support for clinical trials on a virus that may be able to treat a rare neuroendocrine cancer of the type that killed Apple executive Steve Jobs in 2011. Scarff had no crowd-funding experience but got involved because a friend had been diagnosed with the cancer. The campaign, which ended in February, raised more than \$250,000 including direct donations to the team's university — admirable, but short of its goal.

Scarff and others are now independently targeting philanthropists in countries including the United States, the United Kingdom and Sweden to make up the balance. Next time, she says, she will seek smaller amounts in several instalments rather than going for the entire amount at once. "I would break it down into

chunks if I were to do this again for a science-based campaign,” she says. “It makes for smaller, more achievable goals, and it helps you to keep your story developing and evolving.”

Ranganathan agrees with this approach. “Don’t ask for more than \$3,000–5,000 if you’re just starting,” he says. “People always look at the percentage you’ve raised as a sign of social acceptance — they’ll go to a crowded store first because there must be something going on there. If you’re only raising 2% or 3% of your goal, it will look terrible — for you and for the site.” Later campaigns can ask for more.

LEGAL HURDLES

There are other potential sticking points. Telling the world about a research project leaves ideas open to theft. And there are legal pitfalls. No specific laws govern donor-based crowd-funding, at least in the United States, but campaigners need to tread carefully with their pitch — or they risk a lawsuit for misrepresentation, warns Bryan Sullivan, business-law attorney at Early Sullivan Wright Gizer & McRae in Los Angeles. He says that campaigners should remain vague about how the appeal will allocate funds, so that they can use them for administration or other project expenses. And researchers should never imply that a result will be achieved. “You need to say, ‘We believe that our results could show ...’ or ‘In our opinion, our results may ...’” says Sullivan. “You cannot speak recklessly.”

Campaigners should also be aware that income from crowd-funding is generally taxable. Seasoned campaigners recommend that researchers who work at a university or research institute should set up donations to go through the institution, as a grant would. And US donors will not receive a tax deduction for their contributions unless the campaign is set up as a charitable organization.

For those able to build an audience, however, crowd-funding has great potential. Site executives say that it offers a glimpse into what the public wants to support — which could help to persuade funding agencies to sponsor certain studies. “The role of the researcher has been to write grant applications and get funding agencies to accept them. Now researchers can launch crowd-funding campaigns, which helps them evaluate their research,” says Ringelmann. “With that validation, researchers have more power to track their support and negotiate with large funding agencies.”

That can mean a significant impact on morale and enthusiasm. Researchers often feel as if they have more control of their funding destiny with crowd-funding than with a grant application, says Ringelmann. “If you run a successful campaign, you can show that traction,” she says. “This puts the decision-making back in the hands of the people, and that’s incredibly empowering.” ■

Karen Kaplan is associate editor of *Nature Careers*.

TURNING POINT

Lucy Collinson

Lucy Collinson knew little about the machinery of cells when she started working in electron microscopy. But since 2006 she has been head of the Electron Microscopy Unit at Cancer Research UK’s London Research Institute, in charge of helping 40 research groups to see cells of all sorts with clarity. In February, her team and the University of York, UK, won a £2-million (US\$3-million) grant from funders including the UK Medical Research Council (MRC) to buy a state-of-the-art machine that can do both light and electron microscopy, enabling new sample preparation techniques.

How did you get into electron microscopy?

Towards the end of my PhD in microbiology at Queen Mary, University of London, I gave my bacteria (*Porphyromonas gingivalis*, involved in gum disease) to the electron-microscopy facility to assess their virulence. For three years I had been looking at bands of bacterial proteins on gels. Suddenly I was looking at the bacteria. It was amazing.

I later applied for five postdocs, and three involved electron microscopy. I wasn’t particularly looking for that, but it must have been on my mind. I went to work with Colin Hopkins at University College London, doing cell biology and immunology. He did not mind that I didn’t know how cells behaved and had never used an electron microscope. He offered to teach me.

Was it daunting changing direction?

No; I had been considering a shift. During my PhD, I went to a careers lecture where the speaker said that after his doctorate, he had changed direction. He said that what you learn in one field can usually be applied to another, and that interdisciplinary work is where the exciting advances are often made. I had assumed that I would have to stay with microbiology. Once I realized that I didn’t have to, I started looking at other disciplines.

Why did you decide to run a facility instead of focusing on your own research?

During my postdoc I got bored being tied to one line of research. There were not many electron microscopists in our faculty, so we got many requests to help on projects. I liked working on multiple research tasks.

How did you adjust to a management role?

I have four senior scientific officers under me, all experts in electron microscopy, so I



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had to learn management skills. I had good support from my boss and advice from friends in human resources, who told me that I should listen closely to those I manage. Because I had been working on my own, I was used to making decisions and following through myself. It took two or three years to get a handle on managing people and learning to listen. Management is definitely something that you have to learn.

Is your current role much different from that of an academic at a university?

Yes. I have a good overview of lots of topics, but I am not focused on one area. I see myself as an academic, but that is not how people from outside the facility look at you. They don’t always realize that you have done a PhD and a postdoc; they see you as a pure technician. Once we start projects, people realize that we understand what we are talking about. We help them to design their experiments.

What difficulties have you faced in applying for grants such as the MRC award?

Before we got this one, we had just applied for a big virtual-microscopy grant through the Wellcome Trust. It was denied, which was upsetting; so much work went into putting the grant together over a year, and there were many people involved. The MRC grant was completely the other way round. I met with a couple of colleagues last year who invited me to join them. We had four weeks to put the grant together, and we got it. Sometimes you can spend months and months putting stuff together and you don’t get anywhere, and sometimes you get lucky and it all falls into place. ■

INTERVIEW BY KATHARINE SANDERSON