

Raising money for scientific research through crowdfunding

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In this article we discuss the utility of crowdfunding from the perspective of individual scientists or laboratory groups looking to fund research. We address some of the main factors determining the success of crowdfunding campaigns, and compare this approach with the use of traditional funding sources.

Crowdfunding: what is it, and why is it important for ecologists and evolutionary biologists?

Crowdfunding is a new internet-based method of fundraising in which individuals solicit contributions for projects on specialized crowdfunding websites. The focus in crowdfunding is gathering many small donations (the ‘crowd’ in crowdfunding) rather than requesting a single large sum from a funding agency. Crowdfunding drives run over a limited timeframe, anywhere from a single day to several weeks, and attempt to meet a funding goal before the end of the campaign.

The amounts of money raised through crowdfunding are significant and growing rapidly, with 99 million US dollars generated on a single crowdfunding website (www.kickstarter.com) in 2011 [1]. In a wide variety of fields, particularly in the arts, crowdfunding has become a mainstream method of fundraising [2].

In the sciences, as funding rates from traditional sources, such as the National Science Foundation, plummeted below 20% [3], scientists are increasingly considering crowdfunding to support their research. Ecologists and evolutionary biologists have been at the forefront of science crowdfunding, perhaps because crowdfunding is an extension of crowdsourcing, a concept familiar to many ecologists who have used citizen science data for their research.

The power of science crowdfunding goes beyond financial rewards, as it has the potential to connect science and society in a powerful new way. Despite the benefits, few scientists crowdfund, and those who do participate often fail to meet their funding goals or to meaningfully connect the public with their science. Here we aim to help scientists understand the process, and improve their chances of successfully crowdfunding their work.

The crowdfunding model

Crowdfunded projects are framed differently from traditionally funded grants, primarily because the broader impacts of the research are built into the crowdfunding

process. Instead of disseminating results to a broader community upon completion of the research, crowdfunding garners public support before research is initiated. Public outreach is at the forefront of crowdfunding proposals, and cultivating early connections with a wide audience often determines the success of individual funding drives.

The central element of a successful science crowdfunding campaign is developing a crowd: a set of people engaged with a scientist and their research. Consequently, outreach is essential to science crowdfunding, with the outreach demands being far greater than what is generally expected by traditional grant-making agencies. While the time spent nurturing relationships with potential contributors might exceed that of writing up proposed broader impact activities in a typical grant application, the rewards from this bottom-up process can be enormous. This type of funding model can generate lasting relationships between scientists and the public, and crowdfunded research has the potential to reach broader and more diverse audiences than traditionally funded projects.

The larger and more engaged the crowd surrounding a scientist’s research, the more crowdfunding money that can be raised. As a consequence, science crowdfunding rewards scientists who have consistently reached out to audiences over time. Those scientists who do not spend time on outreach and engagement, however, may have a limited group of individuals from which to request donations.

Choosing a crowdfunding platform

There are many websites through which to run crowdfunding campaigns and most of these sites are similar in design and structure (Box 1). The vast majority are for-profit businesses that take a percentage of the money raised by individuals (generally in the range of 8–12%). Due to the for-profit nature of most sites, tax deductions are usually not possible for donors, although exceptions exist. On some sites, if the financial goal of a project is not reached by the end of the campaign period, then donors are not charged and scientists receive nothing. This is typically referred to as ‘all-or-nothing’ funding. On other sites, partial funding is allowed. Larger and better-known platforms, such as Kickstarter and RocketHub, have greater site traffic and can increase exposure as regular visitors check for new projects. However, it should be emphasized that the key factor in the fundraising success of a project is not the particular site, but the crowd that a project initiator brings to that site.

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Box 1. Leading crowdfunding websites

A wide variety of websites exist to host crowdfunding initiatives. Here, we highlight a few of the leading science-centric and general crowdfunding platforms.

Science-centric platforms

- **Microryza** (www.microryza.com): 'Grow the next generation of ideas.' All-or-nothing funding.
- **Petridish** (www.petridish.org): 'Fund science & explore the world with renowned researchers.' All-or-nothing funding.
- **#SciFund challenge** (www.scifundchallenge.org): 'Connecting science and society.' Partial funding allowed.

General platforms

- **Indiegogo** (www.indiegogo.com): 'Go fund yourself.' All-or-nothing and partial funding options available.
- **Kickstarter** (www.kickstarter.com): 'Fund and follow creativity.' All-or-nothing funding.
- **Rockethub** (www.rockethub.com): 'Launch, fund, and fly.' Partial funding allowed.

Fundraising: success depends on outreach

The probability of reaching a fundraising goal depends upon a successful outreach campaign, with a larger crowd translating into more money raised [4]. Social media outlets (e.g., Twitter, Facebook, blogs) provide an easy platform to appeal to potential funders and to channel these individuals directly to a proposal online. However, traditional forms of communication (e.g., public talks, print media) can also be implemented, as many demographics are unfamiliar with crowdfunding and may not encounter a project online.

Crowdfunding platforms generally provide two key ways to pitch a project: a narrative and a short video. The narrative is used for outlining proposed research, while the video helps introduce the researchers themselves and their study. In both the narrative and the video it is important to keep jargon to a minimum, outline the research as simply as possible, and employ creativity and passion. If researchers are enthusiastic about their study, the audience is more likely to become engaged in the process and want to take part in whatever way possible. The video is generally the most important part of the crowdfunding appeal.

Contributors to crowdfunding projects generally expect some type of reward. Crowdfunded projects in technology and the arts offer items such as computer software or performance tickets as rewards to supporters. The 'products' of science, however, are often immaterial. Many successful science-based crowdfunding projects have offered items such as photographs, t-shirts, or acknowledgement in published work. The goal of crowdfunding rewards is the opportunity to feel connected to science and the scientific process. Thus, rewards based on personal connections, such as frequent updates throughout the course of the research, guest lectures, dinners, or hosting donors in the field or laboratory for a day, also have great impact on contributors.

For whom is crowdfunding useful?

A common myth regarding science crowdfunding is that only charismatic projects are funded. The topic of the research, however, is less important to the project's success than the crowd a project engages. Almost any topic in science can be made interesting to audiences. For example, as part of the #SciFund Challenge (a science-specific crowdfunding initiative) many esoteric projects have been

successfully funded. From a project researching the dormant stages of *Daphnia* to another investigating pure ecological statistics, projects that appear to have limited public appeal have been successful, due to the tremendous outreach campaigns by the scientists behind them.

Crowdfunding can serve fundraising needs for both new and established scientists. Current science crowdfunding efforts typically raise less than \$10 000 per fundraising campaign (Byrnes *et al.*, unpublished), an ideal amount for funding a pilot study, purchasing equipment for an existing study, or a summer of graduate student research. However, several lines of evidence suggest that this \$10 000 ceiling can be surpassed. Cancer Research UK, an organization with roots in charitable giving, regularly raises hundreds of thousands of dollars through crowdfunding to support basic biomedical research. Additionally, nearly every discipline that has made use of crowdfunding has started small before developing the capability to raise large amounts [5].

Projects that do raise millions of dollars are typically initiated by individuals or organizations that have spent a long period of time building an audience for their work. Crowdfunding for ecologists and evolutionary biologists is still in its infancy, and we expect that with time and concerted effort to generate interested audiences, larger funding goals can be achieved.

Concluding remarks

Completing a crowdfunding project marks only the beginning of the relationship between scientists and the 'crowd'. Scientists who spend time nurturing these relationships and cultivating new ones will likely experience rewards beyond monetary gain. The true potential of crowdfunding lies not in raising funds for conducting research, but in the opportunities for public outreach and science education engendered by this type of funding model. Presently, the great majority of research never reaches a broader audience, contributing to the mistrust and misunderstanding of science among the general public [6]. Crowdfunding, however, has the potential to shift this paradigm by encouraging scientific transparency and public involvement in the earliest stages of the research process and fostering lasting ties between scientists and nonscientists.

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