

Crowdfunding science: Student raises cash online to follow a flying fox

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The flying fox is an adorable doe-eyed bat with a dark side – it is the perfect vector for emerging infectious diseases from Asia. Susan Tsang, a PhD student in ecology and evolutionary biology at The City College of New York and the CUNY Graduate Center, turned to a revolutionary way to help fund her research into how this species spreads disease.

Ms. Tsang wants to track how viruses can spread from flying foxes to humans by tracing the evolution and movements of bat populations. She sampled the genes of wild-caught flying foxes and planned to fill in the gaps with samples from museum specimens around the world. There was only one problem: she needed funds.

"The grants that have dried up are the ones for smaller projects," Tsang explained. Early-career scientists have felt the economic squeeze more than researchers seeking big grants. "What we need is preliminary data, but how are you going to get it if you don't have a seed grant?"

Ms. Tsang is a pioneering member of a brand new movement in science funding. She brought her research proposal directly to the people as a member of the #SciFund Challenge, the largest collection yet of science researchers attempting to raise money online from private donors. Of 240 scientists that signed on to participate in the #SciFund Challenge, 49 cleared the hurdles of the process to produce videos and webpages for their funding campaigns.

The consortium's webpages functioned under the umbrella of the

successful crowdfunding website, RocketHub, already known for propelling young artists and small filmmakers toward their first flushes of success.

Some of the #SciFund Challenge researchers have seen their funding dreams realized. Projects that caught the public's imagination and early funding dollars included investigations into zombie fish and exploding duck penises. Charting the [flying fox](#) evolutionary tree may seem more prosaic, but results pointing to disease transmission or aiding bat conservation would be wide reaching. While Ms. Tsang has garnered some support, she needs to raise additional funds. This will finance the sequencing of new genes related to the sense of smell and the immune system, along with other standard genetic markers, to figure out the history and linkages of each bat population.

"If we determine the dispersal routes of these bats, it could prove a boon to those interested in global health," noted Tsang. "We need to understand the ecology and evolution of a host as much as a pathogen in order to create preventative measures in case of an epidemic."

Indeed, flying foxes can act as Typhoid Marys, carrying diseases that sicken people without falling ill themselves. They are natural reservoir hosts for several diseases and have been implicated in outbreaks of illnesses such as Lyssavirus and Hendra virus that have killed pigs, horses, and humans. Yet flying foxes have been ignored as vectors until recently, while there has been a great deal of study of birds and livestock that transmit diseases like H1N1 influenza.

Like birds, these large bats can cover long distances and cross oceans. Their range stretches from east of New Guinea, throughout Southeast Asia, and over to islands off eastern Africa.

They also have certain habits that help pass the virus along. They

aggregate in huge roosting colonies of 20,000 to 55,000 individuals where they can trade pathogens. They are attracted to plantations of fruit trees and other trees that are tapped for their sap. Roosting in the trees, the animals sometimes drip saliva on half-eaten fruit or defecate into sap collection containers, both excellent ways to transmit infectious diseases.

Ms. Tsang's research might also help preserve populations of an animal that has disappeared throughout much of its range due to habitat encroachment or overhunting. On top of that, Ms. Tsang noted, the animals happen to be a fascinating evolutionary mystery. "Flying foxes are an oddity even amongst bats," Tsang wrote. Their genes could help explain how they dispensed with the sonar that other bats use, to rely instead on their large eyes and sharp noses to find fruit and nectar.

This is the United Nations Year of the Bat and Tsang hopes that it will serve as a platform to build public support for bat conservation. The [funding](#) project will have been worth it, said Tsang, even without reaching a specific #SciFund goal. "It's been very useful to show others what we do as scientists, especially since bats are poorly studied."

Provided by City College of New York

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