

Strapped for Cash

BY JESSICA LEBER // INFOGRAPHIC BY FLYING CHILLI

Since 2003 the National Institutes of Health's budget has plateaued, even as the number of grant applications has reached record highs. No one has been harder-hit than young researchers competing for their first grant. High-risk research has also suffered as review panels have become more conservative. Despite the introduction of programs to address these problems, the NIH has been unable to keep up, a fact reflected in the dismal success rate: Only about 20% of applicants get grants. Though some relief is on the way—the economic stimulus bill contains a whopping \$10.4 billion for the NIH—that money must be spent within two years, and there are no long-term plans for a budget increase. A continued funding roller coaster could make or break three hypothetical researchers. Here's what each is up against.

Dr. Young

Done with postdoctoral work, he is a new faculty member at a large university and needs his first grant to have any hope of earning tenure.

First try In 2006 the NIH funded only 15% of applications for R01s—the agency's main research project grants—from new investigators.

Approval rates for new investigators



DENIED

Second try By the time his first application is rejected, he has missed the due date for the next round, so Dr. Young must wait one grant cycle to resubmit.

Approval rate for second applications



DENIED

Third try By 2008 many in his frustrated cohort have left academic research, but Dr. Young persists, helped by a new policy of allocating

1,500 R01 awards

to young investigators to even out their success rates with those of more established scientists.

ACCEPTED

The NIH recently launched a pilot program to shorten application review times for new researchers, allowing time to resubmit for a subsequent grant cycle.

First try As funding constricts, peer-review panels seem to favor research projects that promise results. Dr. Risky's application, made in 2003, meets with reluctance even though it is regarded as worthy and "innovative," a qualitative review criterion since 1997.

DENIED

Second try In 2004 she applies for one of the new Pioneer Awards, created to foster research by scientists with unconventional ideas, but funding is available to cover only nine grants.



DENIED

Third try In 2008 the NIH announces an increase in funding to \$1 billion over five years for high-risk-research programs. Dr. Risky applies to a program similar to Pioneer called EUREKA, which in 2008 awarded funding to 38 unconventional projects.



ACCEPTED

Dr. Risky

A midcareer investigator, she wants to pursue projects that challenge existing paradigms and use untried approaches.

Dr. Veteran

Supported by NIH money through most of his career, he is now juggling several grants and expanding his lab.

First try Dr. Veteran received his first grant in 1990, at age 39, then the average for a first-timer (today it's 43.9). To expand his lab, he applies for another R01. His application receives a good score, but so do many others.



About three-quarters of the \$10 billion annual budget for R01 supports continuing multiyear grants.

DENIED

Second try Dr. Veteran tweaks his proposal and tries again, feeding into a vicious cycle that pits a growing number of second attempts against first-time submissions.

DENIED

Third try This time, in 2008, his application is among the 19% that are funded.



It's a good thing too: Starting in 2009, the NIH plans to allow no more than one resubmission. Shortening applications and quantitatively scoring all five review criteria (significance, investigators, innovation, approach and environment) are also planned as the NIH reworks its peer review system.

ACCEPTED

Third time's almost a charm...

In 2007

- 62% of applications were first submissions; these had a



- 26% were second tries, with a



- 12% were third tries, with a

