

Nobel history illustrates gap in grants to young scientists

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A new study by Rice University's Baker Institute for Public Policy illustrates a disconnect between government funding of biomedical research by young investigators and a novel standard by which to judge it: the Nobel Prize.

The study found the average age of biomedical researchers getting their first grant from the National Institutes of Health (NIH) in 2008 was 42. Over the past 30 years, the average age of Nobel winners when they performed their groundbreaking research was 41.

That should trouble those concerned about the United States' standing as a biomedical powerhouse, said Kirstin Matthews, first author of a paper published in the open-access journal [PloS One](#) by the nonprofit [Public Library of Science](#). As older scientists retire over the next two decades, the nation needs to support the next generation of researchers or risk losing them to more sustainable careers, wrote Matthews and co-authors Vivian Ho, the James A. Baker III Institute Chair in Health Economics and a professor of economics; recent alumna Kara Calhoun and senior Nathan Lo, all of Rice.

"This is a bit controversial at a time when we're encouraging more people to get into science," said Matthews, a fellow in science and technology policy at the Baker Institute. "The gist is that we're dealing with a shrinking NIH budget; at best, we'll get the same budget year to year, adjusted for inflation. So how can we use the money most effectively?"

The authors of "The Aging of [Biomedical Research](#) in the United States" decided to pin their numbers to the Nobel not only for its reputation but for the depth and breadth of its archives. "When we started, Vivian looked at me and said, 'Well, when does innovation happen?' The hardest part was to find a way to look at innovation, and the Nobel awards stand out. The [Nobel Prize](#) is one of the few awards that is really consistent.

"We were able to get a good pool of laureates (ultimately 96 who won biomed-related Nobels from 1980 to 2010), and they keep great records." Often, she said, the Nobel archives directly referenced the publications and funding sources at the heart of the winning research.

When researchers won their Nobels was less important than when they had their breakthrough ideas, Matthews said. The researchers found the majority of laureates were below the average age of first-time NIH grant recipients when the Nobel-winning research was conducted.

Overall, the study showed a trend in which the [United States](#) risks losing innovative researchers – and their research – by discouraging promising students from pursuing science disciplines.

Previous studies have found the average age of biomedical researchers receiving their first NIH grants rose from 36 to 41 between 1980 and 2008, while the average age of NIH investigators went from 39 to 51 over the same period.

The authors credited NIH's proactive attitude as the agency tries to tip the balance of research dollars back toward youth. NIH Director Francis Collins has established a task force to create a sustainable and diverse biomedical workforce; one result is a rise in the percentage of grants to new applicants in 2009 and 2010.

Matthews said Elias Zerhouni, NIH director from 2002 to 2008,

recognized years ago that the agency needed to put more emphasis on younger researchers or risk wasting their talents.

"He saw the trend but said when he began at the agency, no one believed him," Matthews recalled from a talk Zerhouni gave at the Baker Institute. "He sent social scientists in to crunch the numbers and found that if the trend were to continue, by 2020 the NIH would award more grants to researchers over 70 than under 40. So he started the ball rolling and Collins has picked it up."

Matthews was aware of recent, controversial press over the problem of not enough jobs for newly minted doctors. (Last year, Nature noted: "The world is producing more Ph.D.s than ever before. Is it time to stop?" The Economist, in December, lamented "The disposable academic.") In fact, the Rice paper cites Nature in determining "the lack of funding and positions also indicates that the current American Ph.D. system might need to be re-evaluated."

"We have so many people who are spending almost a whole decade as a postdoc," she said. "These people are getting great educations and then going off to do something non-science-related. We're losing a good proportion of them because they won't likely go back into research."

Universities should consider teaching their science and engineering graduate students more writing and communication skills, including the art of grant writing, to help those who fail to get funding for sheer lack of experience, she said. At the same time, NIH program officers need to be aware that a failure to fund young investigators can also discourage scientists from pursuing high-risk projects.

Matthews said she found sympathetic ears among the Nobel laureates contacted via email by the Rice team. Several revealed that their own proposals for what ultimately became Nobel-winning research were

rejected by NIH.

"All of them seemed really supportive of young investigators and the initiatives NIH is putting in place to support them," she said.

More information: Read the study at www.plosone.org/article/info:doi/10.1371/journal.pone.0029738

Provided by Rice University

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