How the 'graying biomedical workforce' affects scientific funding in the US

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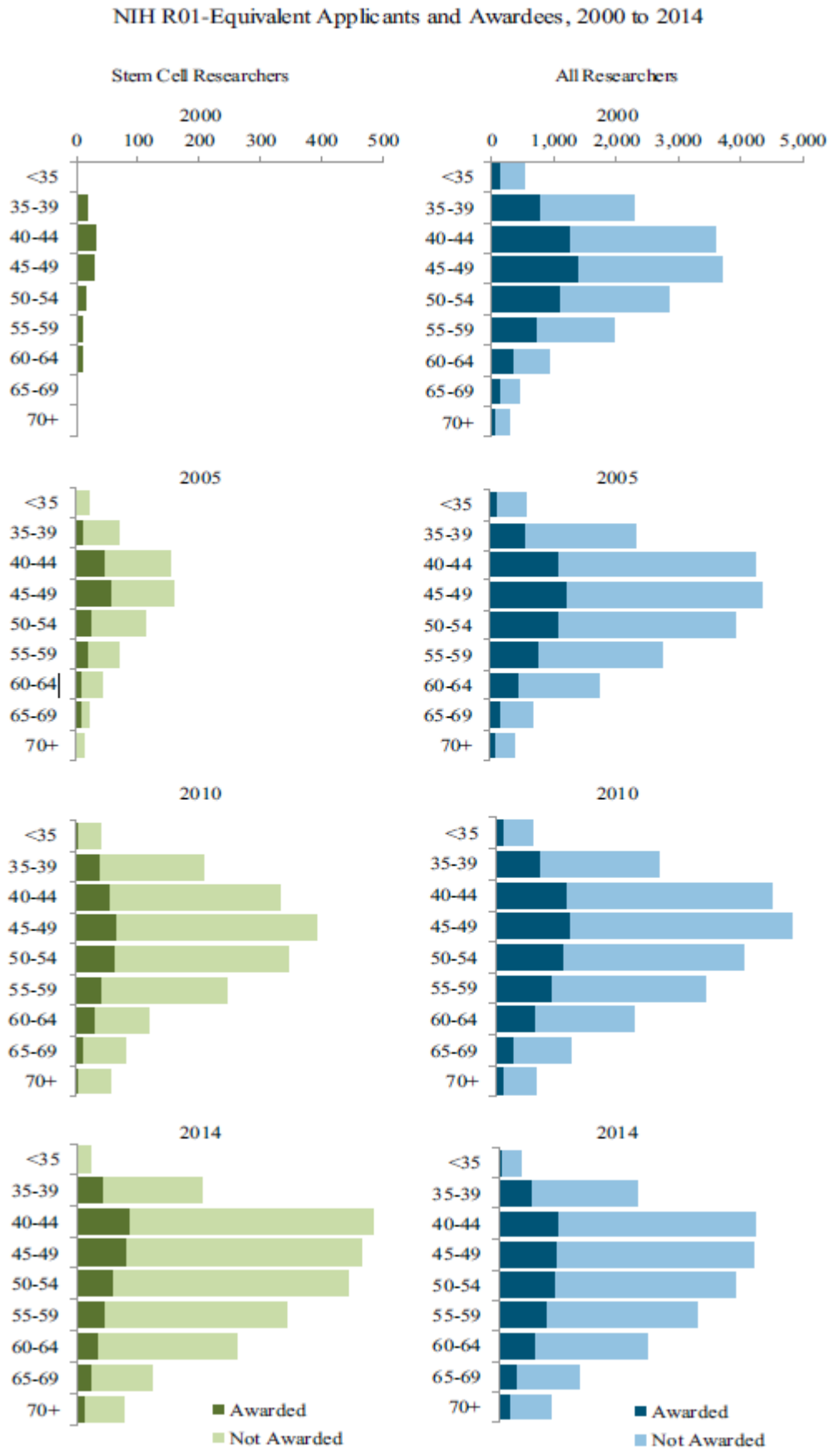
NIH R01-Equivalent Applicants and Awardees, 2000 to 2014
Stem Cell Researchers
All Researchers
2000
0
100
200
300
400
500
1,000
2,000
3,000
4,000
5,000
2005
2010
2014
<35
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70+
Awarded
Not Awarded

These graphs show the number of R01-equivalent grant applicants and recipients counted by year, field, and age group. Credit: Heggeness et al./*Cell Stem Cell* 2016

The United States is on course to experience a steep drop in the number of stem cell researchers in coming years as a large portion of academic scientists reach retirement age and younger scientists continue to leave academia for jobs in industry.

The trend is called the "graying of the biomedical workforce," and many suspect that a preference for older, more experienced researchers in the competitive government grant application process is driving younger scientists away from academia.

But a new government study into how the National Institutes of Health awards R01 grants questions this explanation, according to a paper published July 7 in *Cell Stem Cell*.

"From a policy and leadership perspective, one needs to understand what the near future year implications of an aging workforce are," says Misty L. Heggeness, an author of the study, which was conducted when she was a labor economist in the NIH Office of the Director. "If a system discourages younger cohorts from staying and is heavily composed of older cohorts who will exit the workforce in the near term, who will replace them?"

Grants are the lifeblood of academia, and experts have long noticed that an increasing number of government grants are going to older scientists. Heggeness and her colleagues chose both to study the whole biomedical

research field and to focus in on one subfield—the stem cell field—to dive deep into the potential reasons why more grants go to older researchers. The study authors reviewed biomedical R01 grant records from 1980 onward and the subset of stem cell grant applications from 2000 to 2014.

Their study confirmed that significantly more NIH grants went to older applicants, even in the relatively new field of stem cell research. Between 2005 and 2014, the number of R01 grants going to stem cell scientists aged 60-64 increased by 240 percent. During the same time period, grants going to scientists aged 40-44 increased 80.4 percent, and grants going to scientists aged 45-49 increased by 32.8 percent, according to the paper.

And while competition for R01 grants for stem cell research increased since the early 2000s, there was no clear trend that favored older applicants. Both young stem cell scientists aged 35-39 and older scientists aged 60-69 saw an increase in acceptance rates during the study; from 18.4 to 21.6 percent and 16.3 to 20.9 percent, respectively. However, applicants aged 50-60 saw their acceptance rates decline during the study.

The study found that for the biomedical workforce overall, NIH accepted grant proposals from younger applicants at roughly the same rate as it accepted grant proposals from older applicants—there was just an outsized number of older researchers applying to grants.

"That is a surprising funding, and it is unexpected. A lot of discussions in the community have made the assumption that the funding was preferentially awarded to older applicants," says Heggeness. "We don't see that with this study."

If a preference for older applicants was not directly contributing to the

graying of the biomedical workforce, the authors conclude that a host of other factors must be at play, including changes in how academics are trained and paid.

"The fact of the matter is that to apply for an NIH grant, one needs to be affiliated with an institution," says Heggeness. "If people are receiving tenure track positions later in life today than two or three decades ago—or if younger scientists are moving into the private sector and not applying for NIH grants—that influences the average age of recipients of a first NIH R01-equivalent grant."

Heggeness hopes that future research will identify factors that can encourage younger researchers to stay in academia, such as different grants for young investigators.

"If we can continue to pilot programs and evaluate them rigorously, we can figure out what strategies work best to prepare and engage our younger generations and develop a seamless system for knowledge transfer," she says. "If we can do this, we can make a difference in keeping intelligent, passionate scientists in science, and that will benefit everyone in society."

More information: *Cell Stem Cell*, Heggeness et al.: "Policy Implications of Aging in the NIH-Funded Workforce" www.cell.com/cell-stem-cell/fu … 1934-5909(16)30162-X , DOI: 10.1016/j.stem.2016.06.012

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