

NEWS

# Funding for autism research, explained

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25 MAY 2020

Biomedical research costs money. To understand the causes of a health condition or to develop treatments for it, scientists conduct experiments that require expensive reagents and equipment. Research institutions often do not have enough money to fund their staff's projects, so the scientists apply for grants from funding agencies. In the United States, the National Institutes of Health (NIH) holds the primary responsibility for funding biomedical research.

In 2018, the agency's budget, which is set by the U.S. Congress, reached about \$36.6 billion. The agency distributed nearly \$26 billion, or about 70 percent, **as research grants**.

Although the NIH funds the lion's share of health research, other federal agencies and nonprofit organizations also give out research grants. In 2018, for example, the Department of Defense distributed about **\$1 billion** through its biomedical research programs, and the Centers for Disease Control and Prevention funded thousands of **grants totaling \$5.3 billion**. U.S.-based philanthropic organizations such as the Howard Hughes Medical Institute and the Bill & Melinda Gates Foundation also provide hundreds of millions of dollars in funding each year through competitive grants.

In other high-income countries, health research is funded by similar funding distribution mechanisms. In the United Kingdom, for instance, the Medical Research Council spends about **800 million pounds per year** in research grants and career awards to scientists.

Scientists apply for these grants through a rigorous system of review. Here is how the process works at the NIH.

## **What kind of projects does the NIH fund?**

The NIH is composed of 27 institutes and centers, 24 of which can award research grants. Each institute focuses on a specific condition, organ system or stage of life. Each supports research projects that are relevant to human health and fall within the institute's funding priorities.

### **How much money does the NIH invest in autism research?**

The NIH spent about **\$296 million on autism research** in 2019, according to the agency's estimates of funding for distinct conditions. This investment has grown since 2015, perhaps as a result of annual increases from Congress over the past five years. The trend was in danger of reversing in 2020 after the Trump administration proposed cuts to the NIH budget. But despite this proposal, on 17 December 2019 legislators signed a spending package for 2020 that includes a 7 percent increase in funding for the NIH — \$2.6 billion more than in 2019.

### **Which NIH institutes fund research on autism?**

An analysis based on the **NIH's estimates of funding** shows that more than 15 NIH institutes and centers have funded research on autism in the past five years. In 2018, the National Institute of Mental Health distributed nearly 60 percent, or about \$159 million, of the NIH's autism funds; the Eunice Kennedy Shriver National Institute of Child Health and Human Development spent another 13.8 percent of the funds, and the National Institute of Neurological Disorders and Stroke distributed 10.3 percent.

### **Who can apply for an NIH grant, and how does the application process work?**

In general, any researcher based in the United States or abroad can apply for an NIH grant. But eligibility depends on the type of grant.

The most common type of grant is funded through the NIH Research Project Grant Program, or R01, and is designed to support individual projects for a period of three to five years. Researchers who apply for these grants usually head a lab in which the research will be conducted; they are not required to be U.S. citizens.

Another common type of award is the Program Project/Center, or P, grant. P grants support collaborative efforts that involve multiple independent investigators working on projects that are related to a common research effort.

But scientists do not need to have established themselves as independent researchers to apply for an NIH grant. The agency distributes grants to provide training opportunities to national and international trainees at the undergraduate, graduate and postdoctoral level.

For most NIH grants, the applicants complete detailed proposals describing their research goals and how they plan to accomplish them, including plans for specific experiments and preliminary data supporting the project. The proposals also convey how the project would contribute to accelerating the pace of research in the field overall.

### **How does the NIH assess these proposals?**

Each grant application undergoes a two-step review process. The application is first assessed by a panel of at least three scientists who have the expertise to evaluate its scientific merit. These experts assess and score the application independently for various criteria, including how

innovative the project is and whether it is likely to have an impact on biomedical research. They then come together to discuss the merits of the application and agree on an overall score.

The second review is at the level of NIH advisory councils, made up of both scientific and public representatives who have an interest or expertise in the topic. Only applications that are highly ranked by both the scientific reviewers and the advisory councils are recommended for funding. The individual NIH institutes and centers make the final decisions on which proposals to fund. The entire process can take **more than a month**.

### **What's the success rate of grant applications? And how has it changed over the years?**

The competition for NIH research grants is intense. Over the past 20 years, **the number of applications has doubled**, but the number of grants awarded has plateaued. In 2018, the agency received nearly 55,000 applications and funded about 11,000 — or 20 percent — of the proposals; in 1999, by contrast, the agency funded 32 percent of the 26,408 applications it received.

When a research proposal is not funded, the applicant may either address the reviewers' concerns and resubmit it or submit a new application.

### **What happens after a grant is awarded?**

In most cases, the successful applicant's home institution administers the grant. NIH officials also monitor grants to ensure transparency and identify any problems. They may conduct site visits and review reports from the grantees. They also assess the projects' progress by looking at the resulting publications and patents, drug approvals, changes to prevention and treatment guidelines, and commercialization of innovative ideas.

Once a grant's period is complete, awardees have 120 days to submit a final financial and performance report to the NIH.

### **Does the NIH fund autism research through any other programs?**

Yes. In 2017, for example, the NIH awarded nine research grants for a total of nearly \$100 million over five years to the **Autism Centers of Excellence**. The program aims to identify the causes of and treatments for autism and related conditions.

Over the next four years, the agency is set to award about \$19 million to support seven research projects aimed at developing tools for identifying autism early. The projects, which received more than \$4 million from the agency in 2019, include analyses of infant-caregiver interactions and attention, which may be atypical in infants with autism.