WASHINGTON -- New data compiled by a coalition of top scientific and medical research groups show that a large majority of scientists are receiving less federal help than they were three years ago, despite spending far more time writing grants in search of it. Nearly one-fifth of scientists are considering going overseas to continue their research because of the poor funding climate in America.

The study, which was spearheaded by the American Society for Biochemistry and Molecular Biology (ASBMB) and will be formally released next week, is the latest to highlight the extent to which years of stagnant or declining budgets, made worse by sequestration, have damaged the world of science.

More than 3,700 scientists from all 50 states participated in the study, offering online responses in June and July 2013. They offered sobering assessments of the state of their profession. Eighty percent said they were spending more of their time writing grants now than in 2010, while 67 percent said they were receiving less grant money now than they were back then. Only two percent of respondents said they had received money from their employers -- predominantly academic institutions -- to make up for the loss of federal funds.

The drying up of resources has had a damaging effect on the research being conducted, forcing scientists to curtail their projects or trim their staffs.

According to the survey, 68 percent of respondents said they do not have the funds to expand their research operations; 55 percent said they have a colleague who has lost a job or expects to soon; and 18 percent of respondents said they were considering continuing their careers in another country.

Read the full report, "Unlimited Potential, Vanishing Opportunity":

[science report]
Sequestration is responsible for much of the damage being done to scientific research. The sweeping federal budget cuts have decreased funding for research and development projects across a wide swath of government agencies by $9.3 billion. The $1.7 billion budget cut to the National Institutes of Health alone has meant more than 700 fewer grants were funded this year, NIH Director Francis Collins told The Huffington Post.

But sequestration isn't entirely to blame. According to ASBMB, the purchasing power at the Department of Defense, NASA, the Department of Energy, and NIH has declined by between 20 and 30 percent since 2004 because the research budgets for those agencies has not kept up with inflation.

"Globally, the United States invests more real dollars in research and development than any other country," the study notes. "However, in terms of percentage of gross domestic product, the United States is reducing its investment in scientific research. In fact, of the 10 countries investing the most money in scientific research, the United States is the only country that has reduced its investment in scientific research as a percentage of GDP since 2011."

The respondents to the ASBMB survey were kept anonymous, though their academic institutions were often listed. But The Huffington Post has separately been compiling testimonials of scientists, researchers and academics about how they have been affected by budget cuts. A few of them are presented below, slightly edited for clarity.

Sankar Mitra, Ph.D., University of Texas Medical Branch

The broad research focus of my lab is genome damage induced by oxidative stress and its implication in carcinogenesis. Oxygen free radicals (also known as reactive oxygen species or ROS) has become a common household term. ROS have been implicated in a wide variety of diseases ranging from heart disease to aging and degenerative arthritis to cancer. Our focus is cancer which arises from genome mutations caused by ROS. This particular grant submitted to NIH was based on our surprising observation about a completely unexpected mechanism of ROS generation, i.e., during gene activation. Our preliminary results established that such ROS transiently damage the genome during gene activation induced by external ligands such as estrogen. Repair of the damage is a prerequisite to gene function. The hallmark of cancer is reprogramming of the cells via activation/repression which implies that the genome is continuously getting damaged and repaired at a much higher level than previously estimated. We predict that inhibition of repair by a drug will trigger preferential death of cancer cells.

We were excited to start the project to prove our hypothesis once we receive the research grant from NIH, which should have been in May/June of this year. Unfortunately, the grant was not funded because of sequestration. Now we will have to wait at least until January/February of next year. This delay has set back our program by more than 8 months. Even then, we are lucky that we could finally expect to get the grant. Many other colleagues in various institutions across the country were not so fortunate and have their research program set back by more than a year.
Paul Ney, M.D., New York Blood Center

As a scientist studying human red blood cell development, the sequester has affected my research efforts. Red cells are involved in common diseases, such as sickle cell disease, thalassemia, and malaria. Red cell diseases do not draw as much attention in our country as cancer, but worldwide, they have a major impact on human quality of life and life expectancy. Furthermore, they provide a model par excellence of the inner workings of cells. Examples include the solution of the protein structure of hemoglobin, molecular cloning of the globin genes, the first human disease solved at the molecular level (sickle cell disease), key insights into protein quality control, and the recent discovery of water channels in red cells, which was awarded the Nobel prize in Chemistry. Our laboratory is studying a curious phenomenon in red cells; at the terminal stage of red cell maturation, in order to optimize gas transport and circulatory function, red blood cells jettison all of their mitochondria (the energy factories of the cell). How red cells accomplish this is not known, but we believe it is one manifestation of a general cellular quality control mechanism, which may have broader implications for human disease. Indeed, defective mitochondrial clearance in neurons is directly implicated in childhood Parkinson’s disease. Unfortunately, due to a steady decline in funding for medical research, and paylines for new proposals consistently below 10 percent, this research has not yet received federal support. It is not realistic to expect private companies to assume the expense of research, like ours, with a time to completion of more than a few years. In this regard, federal funding through the National Institutes of Health is the only practical option. Taxpayer support to science goes directly into the economy, advances technology, and improves the quality of our lives. It is truly a win-win proposition.

Alison Meyer, Ph.D., Duke University

I am a postdoctoral fellow at Duke University. I'm in my 4th year here. I applied for an NIH-funded grant in 2009. While I received my score within a few months, due to the significant delays in the federal government passing a budget, I actually did not find out my grant was (thankfully) funded until over a year after I submitted it. The grant is for 3 years, and the first year is mandatory. The 2nd year is referred to as the "payback" year, meaning that if I left science entirely, I would have to pay back all of the previous year's funding. While I'm beyond grateful that I received the grant, the delay in vote actually pushed my life and career back 1 year due to the rules that come with the grant. If you can't start your grant right away, you can't make it through years 1 and 2 as soon as possible. I'm now entering the job search phase. I want to do cancer drug discovery/target validation research. However, due to the poor economy, companies tend to cut drug discovery programs in favor of increased marketing on the "sure thing" drugs they already have for sale. In addition, all of the jobs I have received call backs on are postdoctoral positions, meaning my salary would not change. After 10 years of training, I'm still not considered trained? Basically, the companies know they can get away with paying someone a smaller salary for the same amount of work. This is why very few scientist/sr. scientist positions are available in industry. Academia, as you are well aware, is struggling immensely. The sequester (and overall state of the economy) has prevented me from progressing. I'm stagnating. I'm 32 years old with no retirement funds. I just want a job doing bench science, which I've spent a decade training for. I know nothing else. I sincerely wish I had not chosen this path, but the future was so bright in 2003. It's quite humiliating to see the incoming graduate students watch me struggle to find a job.

Additionally, our lab is running out of funding. My boss is starting to give workers deadlines for departure if they are not currently independently funded by a grant. This puts enormous pressure on people looking for jobs (which aren't there). Wishing for a change, but knowing it will be awhile coming. I hope that I can get a second dose of good luck and find a job soon!