

**TESTIMONY OF THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY (FASEB)  
SUBCOMMITTEE ON LABOR, HEALTH & HUMAN SERVICES AND RELATED AGENCIES  
NATIONAL INSTITUTES OF HEALTH  
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The National Institutes of Health (NIH) is the world's premiere sponsor of medical research and is the federal agency responsible for conducting and supporting the basic and clinical science that drives development of treatments and cures for disease and injury. A component of the Department of Health and Human Services, NIH comprises 27 Institutes and Centers, which collectively fund more than 325,000 scientists at more than 3,100 universities and institutions in every state. The researchers receiving NIH funds are united by a compelling desire: to investigate the underlying biology of human disease and use this knowledge to improve our health and save lives.

Through its competitive peer review system, which is emulated throughout the world, NIH ensures support of the highest quality research and seeks input from more than 30,000 scientists and members of the public who serve on NIH advisory boards, review groups, and expert panels. Scientists funded by NIH lay claim to 122 Nobel Prizes, including the 2007 Nobel Prize recipients in physiology or medicine: Mario R. Capecchi, Ph.D., of the University of Utah School of Medicine and Oliver Smithies, Ph.D., of the University of North Carolina. Drs. Capecchi and Smithies, together with their colleague, Sir Martin Evans, Ph.D., of Cardiff University, developed the immensely powerful gene "knockout" technology, which allows scientists to create animal models of human disease and study gene function. Over the past 50 years, the research supported by NIH has been and continues to be responsible for the revolutionary medical and health advances that have taken place.

### **NIH Research Has Led to Improved Health**

Thanks to NIH-funded scientists, working at universities and institutions across the nation and on the NIH campus in Bethesda, Maryland, we have transformed many previously deadly or debilitating diseases into manageable conditions. Below are only a few select examples of how the research funded by NIH has saved and improved the lives of millions of Americans and provided doctors with tools to prevent and/or treat disease:

- More than one million lives per year are saved due to therapies to prevent death from **heart attack and stroke**, resulting in a nearly four year gain in American life expectancy. Decades of NIH-supported fundamental research on cholesterol synthesis, clot-busting agents, and the basic biology of the cardiovascular system has culminated in blockbuster drugs such as statins that are utilized worldwide and have improved the health of more than 25 million Americans. The recent discovery that the anti-cancer drug Taxol, when used to coat the wire-mesh stents used during angioplasty, can prevent blockage of arteries, is expected to substantially reduce the more than 350,000 annual open-heart bypass surgeries.
- Since 2002, deaths from **cancer** have been steadily reduced, dropping an average of two percent per year. In December, 2005, as a result of the work of hundreds of NIH-funded scientists studying strategies to block the cell signals that cause tumors to grow, Sorafenib was identified as a promising treatment for **kidney cancer**. Less than a year later, the FDA approved the use of a vaccine against human papillomavirus (HPV) which has the potential to prevent 70% or more of **cervical cancer**, the cause of 300,000 deaths per year. The connection between HPV and cervical cancer which led to development of the vaccine was made through the research of NIH-supported scientists. And in one of NIH's most powerful success stories, the survival rate for **childhood cancers**, which not long ago claimed the lives of more than half their victims, is now nearly 80% and improving.

- NIH-funded discoveries revealing the fundamental nature of the immune system and the diseases that challenge it have vastly improved the quality of life for patients with conditions ranging from **rheumatoid arthritis** to **multiple sclerosis** to **HIV/AIDS**. Drugs which block the actions of tumor necrosis factor alpha (TNF- $\alpha$ ) have dramatically improved the quality of life for some rheumatoid arthritis patients, eliminating symptoms, increasing energy, and decreasing inflammation while halting the progression of joint destruction and promoting repair of tissue damage. For those suffering the debilitating effects of multiple sclerosis, several new treatments that modulate the immune system are available, their discovery and development having been funded in part by NIH. HIV/AIDS, once a terminal illness, has been transformed through drug therapy into a chronic disease, with AIDS drugs estimated to have saved three million years of life in the United States alone.
- NIH-funded research on the effects of lifestyle changes is helping to teach Americans how to prevent **diabetes**, reverse serious **heart disease** risk factors, and slow the signs of aging. Diet and exercise changes have been shown to reverse diabetes and metabolic syndrome, strengthen bones and prevent **osteoporosis**, and even reduce the risk of **dementia**. Studies have shown that people who exercise regularly in middle age are one-third as likely to get **Alzheimer's disease** in their 70s as those who did not exercise. And even people who begin exercising in their 60s have their risk reduced by half.

### **Investment in NIH Brings Hope, Treatments on the Horizon**

Arguably, the two trends of greatest consequence for American health in the twenty-first century are the rapid aging of the population and the unprecedented progress in medical research that is helping us to live longer, healthier lives. The life sciences revolution that has taken place over the past two decades has led us to the brink of developing new treatments and strategies for confronting our greatest health challenges, including those of the over-65 population, soon to number 70 million. Investment in NIH has already unlocked the secrets of the human genome and allowed scientists to gain new insight into how disease works at the most basic levels within our bodies. Researchers are arming themselves with this knowledge to identify targets for new drugs, therapies, and vaccines, which can halt the progression of disease before irrevocable damage occurs:

- **Blindness:** The prospect that it may someday be possible to restore vision in some people who have lost most or all of their eyesight was strengthened when scientists were able to help blind mice regain some ability to see after receiving transplants of cells taken from the eyes of other mice. NIH-supported researchers showed for the first time that light-detecting cells in the retina can orient themselves properly after being injected into a blind eye, connect to other nerve cells and communicate appropriately with visual centers in the brain. Moreover, researchers have discovered the genetic flaws that underlie a major type of glaucoma, a leading cause of blindness. Similarly, scientists have identified a genetic abnormality that accounts for up to 50 percent of **Age-Related Macular Degeneration (AMD)** cases, a blinding disease for which more than 8 million older Americans are at risk. By pinpointing what goes wrong in these conditions, these findings may provide a basis for devising new treatments.
- **Alzheimer's disease:** A team of NIH-funded scientists have developed a test that was about 90 percent accurate in distinguishing the blood of people with Alzheimer's from the blood of those without the disease. The test was about 80 percent accurate in predicting which patients with mild memory loss would go on to develop Alzheimer's disease two to six years later. In addition, basic and genetic studies describe some of the processes involved in Alzheimer's, revealing

numerous targets for new drug development. Such discoveries shed light on why toxic molecules build up in the brain and lead to the plaques and tangles characteristic of Alzheimer's, and how brain cell signaling systems affecting memory are disrupted.

- **Drug resistant tuberculosis and staph:** Nearly one-third of the world's population is infected with *Mycobacterium tuberculosis*, the infectious agent that causes TB, and more than one million people die of this disease each year. In recent years, TB has presented even more serious challenges, with the emergence of multiple drug resistant and extensively drug resistant TB. NIH has developed a drug known as SQ109, in partnership with the biotech company Sequella, which is currently undergoing FDA-approved clinical testing for treatment of drug resistant TB. The recent epidemic of Methicillin-resistant (drug resistant) *Staphylococcus aureus* (MRSA) has underscored the critical importance of research to seek new ways to counter and prevent the emergence of "super bugs."

### The American Public Supports Medical Research

Polls have shown that Americans are extremely concerned about their health and health care, setting these as priorities above keeping their jobs, paying their mortgage, or even being protected from a terrorist attack.<sup>1</sup> The popular press, from television to newspapers and magazines to Internet blogs, is filled with reports of new medical research findings and advice about staying healthy. NIH drives the engine of medical research discovery, addressing public health priorities and funding the cutting edge science that captures our national attention. This is why the people of the United States overwhelmingly support medical research:

- Surveys have found that 83 percent of Americans would be **more likely to vote** for a candidate that supports increased funding for research to find cures for and prevent disease<sup>2</sup>.
- A majority of Americans (78%) choose medical research as the best strategy for **reducing health care costs**<sup>3</sup>. Data supports their belief: NIH-funded advances in coronary heart disease alone are estimated to have generated \$2.6 trillion in economic return for a total cost of about \$110 per American over a 30 year span<sup>4</sup>.
- More than three-quarters (76%) of U.S. respondents thought that it was very important that the **U.S. remain a global leader** in scientific research<sup>5</sup>.

### New Threats Emerge as Funding Lags Behind

Emerging diseases and new health threats dominate our headlines – from **drug resistant staph infections** ("MRSA") to **SARS, West Nile Virus, and avian influenza** – while our aging population lends a new sense of urgency to meeting the challenges of **Alzheimer's disease, osteoporosis, and macular degeneration**. Yet even as the need to prevent disease becomes greater and the opportunities to succeed become more numerous, our nation has begun to neglect our commitment to medical research. Never before has science been more poised to advance the discoveries that will improve our health, yet never

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<sup>1</sup> Kaiser Family Foundation. (2003-2007) *Kaiser Health Poll Report*.

<http://www.kff.org/healthpollreport/currentedition/index.cfm?CFID=19610911&CFTOKEN=77244741>

<sup>2</sup> Research!America (2006) *America Speaks: Poll Data Summary, Volume 8*,

<http://www.researchamerica.org/publications/AmericaSpeaks/AmericaSpeaksV8.pdf>

<sup>3</sup> *Ibid*

<sup>4</sup> National Institutes of Health, <http://www.nih.gov>

<sup>5</sup> Research!America (2006) *America Speaks: Poll Data Summary, Volume 8*,

<http://www.researchamerica.org/publications/AmericaSpeaks/AmericaSpeaksV8.pdf>

before have we been more in danger of squandering our scientific talent and delaying critical breakthroughs:

- Flat funding of NIH, combined with the effects of inflation, has eroded the purchasing power of the agency by about 13%. With every excellent unfunded idea, **we stand to miss or delay the critical discovery** leading to therapies for our most debilitating health conditions.
- The NIH funding situation **threatens to affect an entire generation of young researchers**. The 60,000 postdoctoral researchers, or “postdocs,” who represent America’s scientific future and are on the path to a lifelong career in research are being negatively affected by the decline in NIH’s budget. Specifically, the funding cuts are resulting in fewer hires, lower salaries and increased layoffs. Many of the post-docs see their scientific mentors struggle to maintain grant funding from NIH and are beginning to question whether they should invest in such a risky career. Many of **our best and brightest scientists** are seeking more promising opportunities outside of the lab or in other nations.
- Over the past generation, the average age at which American biomedical researchers with Ph.D. degrees succeed in obtaining their first research project grant award (R01) from the NIH has **increased from 34.2 to 41.7 years of age**. Furthermore, the percentage of NIH proposals receiving funds will likely be cut nearly in half by the end of 2007, as compared with levels just six years ago. While a career in medical research may always be riskier than other career paths, some **hope for a sustainable future** is essential to attract and retain talented individuals.

#### **We Must Fulfill the Promise: NIH at the Crossroads**

Over the past 50 years, NIH and its grantees have played a major role in the explosion of knowledge that has amounted to a revolution in biology. This knowledge has led to an unprecedented number of medical breakthroughs and discoveries that promise to improve the health and extend the lives for millions of people.

The good news is that – mainly due to medical advances in the treatment of heart disease, cancer and stroke – we’re living longer and healthier lives. In September 2007, the National Center for Health Statistics said a baby born in the U.S. in 2005 should expect to live nearly 78 years on average. That’s a record, up nearly three percent from a decade earlier, and only the most recent rise in a consistent gain in life expectancy.

During the next 25 years, the number of Americans with chronic diseases is projected to reach 46 million. If we are to successfully confront the health care challenges associated with a growing elderly population, it’s going to require sustained support for basic and clinical research.

In the last five years, however, the NIH budget has failed to keep up with inflation, and we are in danger of sacrificing our nation’s dominance in biomedical research and biotechnology as well as risking the status of our research institutions as the envy of the world. New opportunities for path-breaking research are going unfunded, and there is a real chance that the number of new therapies under development will begin to decrease. Therefore, it is imperative that we renew our commitment to medical research and to fulfill the hope of the American people by making NIH a national priority.

**In order to fulfill the extraordinary scientific and medical promise of biomedical research, FASEB urges Congress to make the National Institutes of Health a priority and respectfully requests that NIH receive \$ 31.2 billion in FY 2009.**