Revolution in Science and Medicine

From statins that lower cholesterol and reduce heart attacks, to targeted treatments for cancers, the knowledge and technology generated by NIH-funded research gives rise to the vast majority of new medicines. This vibrant government-university partnership received a crucial boost between 1998 and 2003, when Congress doubled the NIH budget and set a course for far-reaching advances in health.

The new fields of genomics and proteomics blossomed, enabling scientists to probe biological phenomena beyond reach just 10 years ago. Scientists have now identified nearly all of the 25,000 human genes. This genetic code reveals the instructions that create and maintain human life, and errors that can lead to disease. Scientists have discovered more than 1,800 disease-causing genes.

Using high-throughput technologies and powerful imaging techniques, scientists are also identifying the hundreds of thousands of human proteins that do the work of the body. Together, these advances are uncovering core causes of disease and leading to better modes of prevention and treatment.

One discovery that has accelerated research is RNA interference (RNAi), a cellular mechanism that can shut off any gene. Its finding in 1998 launched a new field of research, and it may soon be used to treat conditions such as a form of age-related blindness and infection with hepatitis C virus. Its discovery through NIH-supported laboratories won the 2006 Nobel Prize for Physiology or Medicine—a mere eight years after the power of RNAi was uncovered.

Universities' own financial commitments have contributed to the fast pace of discovery. Medical schools invested $8.6 billion in laboratories between 1990 and 2002, and planned to spend an additional $9.5 billion between 2003 and 2007. The NIH's highly visible commitment to research helped universities raise funds from private donors. Together, the NIH and research institutions have created a remarkably productive research enterprise.

These advances can sometimes enable scientists to move more directly from basic research to addressing medical problems. One telling example is West Nile Virus, a potentially deadly infection. It appeared in New York in 1999 and by 2004 had reached California. Today, researchers are testing several vaccines, and scientists at Washington University in St. Louis have identified a powerful drug that is about to enter clinical trials. Working with genetically modified mice, they discovered an antibody that can clear the viral infection even after it reaches the brain, and then adapted the antibody to work in humans.

As a nation, we have banked much on basic research and reaped previously unimaginable rewards. The United States has a cadre of talented researchers who have the tools, knowledge, passion and drive to continue to unravel the persistent mysteries of life and thus improve human health.

But the full benefits of these national investments cannot be realized as long as funding for basic biomedical research remains stalled. Flat funding will delay promising research and discourage students from pursuing research careers. Consistent and robust funding of the NIH—that at the very least does better than inflation—is a must.