March 17, 2025

Science Starts Here: Research Institutions and Academia

A letter from David A. Brenner, MD, President and CEO of Sanford Burnham Prebys

The biotechnology market in the United States is gargantuan, exceeding $553 billion in 2023 and projected to grow to almost $1.8 trillion by 2033. The current U.S. pharmaceutical market is even bigger at $639 billion last year, projected to reach more than $1 trillion by 2030.

Both are global leaders in size and output. In a study published a few years ago, researchers found that of 252 new drugs approved by the U.S. Food and Drug Administration (FDA) between 1998-2007, 118 originated in the U.S. Japan, the United Kingdom and Germany were next, but all in the low 20s.

More than half of new drugs are first launched in the United States each year. The FDA approved 50 new therapeutic compounds in 2024. It may not sound like a lot, but no other country comes close.

It takes a lot of time and money to conceive, develop and successfully get a new drug to market. The estimated mean cost from start to finish is $172 million. Add in capital costs and the inevitable failures along the way (90 percent of new drugs fail clinical trials) and that estimate rises to nearly $880 million per new drug. The average time required to develop a drug and get FDA approval, if it happens at all, is 10-15 years.

These are daunting numbers, and so it's no surprise that the biotechnology and pharmaceutical industries are always keen to minimize financial exposure and risk. They are, after all, for-profit enterprises. They pursue every possible angle to ensure their drug investments yield maximal results.

They can do this in large part because of a long and lucrative arrangement with academia and independent, non-profit biomedical research institutes like Sanford Burnham Prebys, who have historically done the initial heavy lifting, from basic discovery through the early stages of clinical trials.

Universities and research institutes typically pay out of their own pockets to fund research in its earliest stages when ideas are too unproven to secure government funding. Big Biotech and Big Pharma prefer to take promising drugs over the finish line, but not necessarily get the process started.

Original thinking and innovation most often happen where the pursuit of new knowledge is the primary mission. That's in the DNA of universities and independent research institutes. Universities and independent research institutes exist to ask and answer the hard, basic, necessary questions of science that may or may not lead to new drugs, treatments and improved human health.

Academic and non-profit scientists can do this kind of work because the institutions where they work are structured to support their research, and those institutions are supported by the National Institutes of Health (NIH) and its enduring, highly successful partnership with universities and research institutions to advance American science.

“We cannot be a strong nation unless we are a healthy nation. And so, we must recruit not only men and materials, but also knowledge and science in the service of national strength,” said President Franklin D. Roosevelt in 1940 at the dedication of the first buildings that would headquarter the newly created NIH.

That vision—and the promise of future achievement—is now severely threatened by the NIH’s announced efforts to cap indirect costs (IDC) and other related acts of obstruction (see earlier letters).

In recent years, there has been a push to create new and more collaborations between biotech/pharma and academia/non-profit research. These are welcome and vital, given the extraordinary costs and complexities of biomedical research.

For example, the Conrad Prebys Center for Chemical Genomics at Sanford Burnham Prebys is the largest nonprofit drug discovery center in the United States. Its researchers work with biotech, pharma and other institutions to translate promising ideas into new drugs by assessing and testing thousands of potential therapeutic compounds each year to determine which might meet the strict criteria for clinical trials.

But this kind of partnership comprises only a fraction of total research. It cannot compensate for the diminishing and dismemberment of the current NIH-supported system, which contributed to published research associated with every one of 210 new drugs approved by the FDA from 2010 to 2016.

Certainly, the system can be improved, but it has worked remarkably well for more than 75 years.

Biotech and Big Pharma are the beneficiaries of basic science conducted in academia and at independent research institutions. They often have limited ability to do basic research, or the desire. The return on investment (ROI) is just too low: In 2023, the projected ROI in pharmaceutical research and development spending was 4.1 percent, which represents an upswing. In 2022, it was 1.2 percent.

Advocates for the IDC cap and other related measures do not recognize this reality or the real costs of doing science. Implausibly and without evidence, they propose cuts, reversals and retrenched thinking at a time when public health threats are urgent (think measles) and experts say U.S. research is in decline.

IDC caps and similar misguided notions will only weaken science, our health and the nation.

Sincerely,

David A. Brenner

David A. Brenner, MD
President and Chief Executive Officer
Donald Bren Chief Executive Chair