



SETTING THE PACE OF PROGRESS:

# U.S. Investment in Cancer Research Saves Lives

**Over the past 50 years, the United States' investment in research to better understand, prevent, diagnose, and treat cancer has paid off. Thanks to funding for the National Institutes of Health (NIH) and National Cancer Institute (NCI), millions more Americans are surviving cancer. In the United States, a record 15.5 million survivors of cancer are alive today—more than 5 times the number of survivors alive in 1971.<sup>1</sup>**

People are not only living longer, but they're living better, with higher quality of life due to fewer side effects like infection or nausea. Federal research funding has also brought about a revolution in our understanding of cancer, generating precise and effective treatments increasingly targeted to each person's tumor type, genetics, and treatment tolerance.

This publication provides an overview of the top advances in cancer prevention and treatment that were funded by the NIH or NCI, highlights the clinical trials that lead to important new cancer discoveries, and addresses the status of cancer research funding today.

## Federally Funded Cancer Research Advances

The NIH and NCI fund vital cancer research that private industry has little incentive to conduct, such as studies focused on prevention and screening, treatment for rare cancers, and studies comparing the effectiveness and safety of similar treatments. Federally funded research also generates biomedical innovations that fuel the entry of new therapies into the market—helping to make the United States the global leader in developing new cancer treatments. Some of the top advances funded by the NIH and NCI include: <sup>2</sup>



**Cervical Cancer Prevention: HPV Vaccines** – Federally funded research helped establish human papillomavirus (HPV) as a major cause of cervical cancer and developed the technology used in HPV vaccines to prevent cervical and other cancers.



**Improved Understanding of Breast Cancer** – Federally funded research led to the discovery that blocking the HER2 protein could slow the growth of certain breast cancers, paving the way for the development of trastuzumab (Herceptin), which revolutionized breast cancer treatment.



**Diet and Exercise Reduce Risk of Breast Cancer** – Federally funded research showed that lifestyle changes, including a low-fat diet and exercise, decrease the risk of breast cancer recurrence and death in women with early-stage breast cancer.



**First Immunotherapy for Cancer** – Federally funded research led to development of rituximab (Rituxan) for the treatment of non-Hodgkin lymphoma, leading to a steady decline in deaths from the disease. Rituximab was the first immunotherapy approved specifically for cancer.



**Targeted Treatments Lead to Increase in Survival Rates for Some Cancers** – Federally funded research contributed to the discovery of a targeted treatment for chronic myelogenous leukemia (CML), turning a disease with almost no long-term survivors into one with a normal life expectancy for most patients.



**New Chemotherapy Treatments** – Federally funded research led to the discovery of platinum-based chemotherapies, which are now prescribed to an estimated 10%-20% of all people with cancer, including those with lung, breast, cervical, ovarian, and bladder cancers, among others. The treatment is particularly effective in patients with testicular cancer, with a cure rate of more than 90%.



**Lung Cancer Screening** – Federally funded research proved that new screening technology could detect small aggressive tumors early enough to remove them by surgery, reducing deaths by 20%.



**Understanding the Link Between Genes and Cancer** – Federally funded research helped to identify inherited gene mutations (*BRCA1* and *BRCA2*) associated with particularly aggressive forms of breast cancer and ovarian cancer. Now, screenings are available so that people with a family history of these cancers can make informed decisions about strategies to reduce their cancer risk.



**CAR T-cell Therapy** – Federally funded research that started nearly three decades ago led to this unique new way of treating cancer.



**Shortened Cancer Treatments** – Federally funded research showed that chemotherapy for certain patients with colon cancer could be shortened from 6 months to 3 months without impacting survival rates.

ASCO has developed the Cancer Progress Timeline, an interactive, data-rich resource that provides a historical overview of major milestones in cancer research that have led to better patient outcomes and quality of life. ASCO's Timeline highlights more than 150 advances that were funded all or in part by NIH and NCI. Visit [asco.org/cancer-progress](http://asco.org/cancer-progress) to learn more.



### FEDERALLY FUNDED RESEARCH BADGE

ASCO has created a badge to highlight research that has received federal funding. This badge appears with studies with studies in the Cancer Progress Timeline that have received federal funding.

# RESEARCH FUNDING BY THE NATIONAL CANCER INSTITUTE: FROM PIPELINE TO PATIENT

Today's cancer breakthroughs are the result of decades of federal investment in cancer research. Sustaining the investment in the National Cancer Institute (NCI) is essential to transform research discoveries into new treatments and improve care for millions of people with cancer.



CONGRESS FUNDS NCI



NCI DISTRIBUTES FUNDING

## TIMELINE

Several months to years<sup>3</sup>

**BASIC RESEARCH** in laboratories results in discoveries like genetic alterations that can cause cancer and how cancer interacts with our immune system.



### KEY MILESTONE

NCI-funded research in the late 1980s led to a precursor to CAR T-cell therapy, which involves genetically re-engineering a patient's own immune cells to attack cancer. The first CAR T-cell therapy was successfully tested in patients in 2010 and approved by FDA in 2017.<sup>4,5</sup>

3 to 10 years

**TRANSLATIONAL RESEARCH** turns basic research discoveries into new diagnostic tests and novel treatments that can be clinically tested.



### KEY MILESTONE

NCI-funded translational research shed light on vulnerabilities in soft tissue sarcoma cells, paving the way for a new first-line treatment for soft tissue sarcoma – the only one approved by FDA in the last 40 years.<sup>6,7</sup>

3 years to over a decade

**CLINICAL RESEARCH** studies the safety and efficacy of new treatments in humans and examines how they compare to existing treatments.



**TREATMENT TRIALS** test new therapies or new ways of using existing therapies. NCI generally funds trials not supported by industry, including studies on the comparative effectiveness and safety of drugs and trials that test a combination of therapies.

### KEY MILESTONE

An NCI-funded study found that for some people with colon cancer, a 3-month course of chemotherapy after surgery was nearly as effective as and resulted in fewer side effects than a 6-month course.<sup>9</sup>

**PREVENTION & SCREENING TRIALS** test new methods for reducing the risk of cancer and detecting it early.

### KEY MILESTONE

NCI's 10-year National Lung Screening Trial found that screening with CT scans reduced the risk of lung cancer death by 20% in current and former heavy smokers compared to chest X-rays.<sup>10</sup>

Ongoing

**FDA APPROVAL** allows companies to market new drugs that are proven safe and effective in clinical trials.<sup>11</sup>

Through **CLINICAL GUIDELINES**, research findings help shape standards of care and are translated into practice, where they reach patients.

PATIENTS BENEFIT

Federal funding for cancer research is vital to our future. Americans are counting on our leaders to invest in biomedical innovation that will deliver the next generation of cancer advances to patients.

For additional information and timeline references, please visit [asco.org/nihfunding](http://asco.org/nihfunding).

To learn more about major advances in cancer, visit [asco.org/cancer-progress](http://asco.org/cancer-progress).

## Federal Funding Landscape

Virtually every American has been touched by cancer, and voters in the United States overwhelmingly support greater investment in cancer research. In a recent survey commissioned by ASCO of more than 4,000 Americans, nearly three-quarters (73%) said the government should spend more on finding treatments and cures for cancer—even if it means higher taxes or adding to the deficit.<sup>12</sup>

Federal investment in research not only saves lives, but it also generates economic growth and keeps the United States competitive globally.



**\$1 → \$2.21**

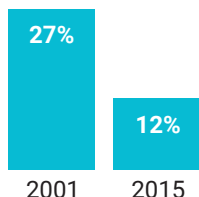
Every \$1 in NIH funding generates \$2.21 in **local economic growth**<sup>13</sup>



**\$65 billion**

The **amount NIH funding contributes** in economic growth annually<sup>14</sup>

Despite the positive impact on the economy and strong public support for cancer research, NCI's budget remains lower than it was before the 2008 recession when adjusted for inflation. This stagnant funding makes it challenging to sustain clinical trials and difficult to attract and retain talented cancer researchers.



**12%**

**New research proposals funded** by NCI in 2015, compared to 27% in 2001<sup>15</sup>



**75%**

**The drop in the number of fully funded NIH studies** presented at ASCO's Annual Meeting from 2008-2017<sup>16</sup>



*Congress must continue to provide stable, predictable funding increases to NIH and NCI that will allow our nation to continue to build on the promise of today's research and steadily improve tomorrow's outcomes for people living with cancer.*

*Learn more at [asco.org/nihfunding](http://asco.org/nihfunding).*

Founded in 1964, the American Society of Clinical Oncology (ASCO) is committed to making a world of difference in cancer care. As the world's leading organization of its kind, ASCO represents more than 40,000 oncology professionals who care for people living with cancer. Through research, education, and promotion of the highest-quality patient care, ASCO works to conquer cancer and create a world where cancer is prevented or cured, and every survivor is healthy. ASCO is supported by its affiliate organization, the Conquer Cancer Foundation. Learn more at [www.ASCO.org](http://www.ASCO.org), explore patient education resources at [www.Cancer.Net](http://www.Cancer.Net), and follow us on Facebook, Twitter, LinkedIn, and YouTube. Visit [ascoaction.asco.org](http://ascoaction.asco.org) for the latest cancer policy developments.

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