



Annual Plan & Budget Proposal For FY 2020

At a Glance

DIRECTOR'S MESSAGE: A TIME OF GREAT HOPE AND GREAT CHALLENGE

As director of the National Cancer Institute (NCI), I am pleased to share our *Annual Plan and Budget Proposal for Fiscal Year 2020*.

Having been sworn in to my position a little less than a year ago, this marks my first opportunity to present, in this form, the promising results of our country's investments in biomedical research. This plan directs attention to areas where additional support has unique potential to improve cancer prevention, detection, and treatment.

To place the plan's focus squarely on those most likely to benefit from NCI research, we have included stories of patients. While each story is unique, they are not that different from that of Mike, a patient I treated for acute leukemia.

Mike started feeling poorly in 2016, and a bone marrow biopsy revealed acute myeloid leukemia (AML). I began his initial treatment with aggressive chemotherapy, which caused difficult side effects and required him to spend more than a month in the hospital. After further therapy, Mike fully recovered, and he has been in remission for more than 2 years.

Mike, and patients like him, are our true partners in cancer research. They are the reason we do what we do.

We are in the midst of a historic moment in cancer research. Groundbreaking discoveries from multiple disciplines—epidemiology, pathology, molecular biology, medicinal chemistry, structural biology, data science, and others—have converged into remarkable advances and clinical benefits. These insights have triggered unprecedented industry investment, philanthropic support, and patient advocacy for



Norman E. Sharpless, M.D., with former patient Mike, whom he treated for acute leukemia in 2016.

cancer research. In addition, NCI has benefitted from concerted, sustained, and bipartisan support from Congress and the White House.

As a result, patients today have better options for more effective and less toxic therapies than ever before. It is not a coincidence that death rates for most cancers are on a steady decline. And it's not by chance that the age-adjusted rate of new cancer cases is steadily decreasing.

Yet as we celebrate new successes, we face new and existing challenges. There are still too many cancers

for which we lack effective screening and prevention, and others for which we lack effective therapies. Some new treatments are so expensive that they are inaccessible to many patients. Some cancer treatments have side effects that may be considered worse than cancer. The dissemination and implementation of effective treatments to the community setting can be slow and inconsistent.

We are tackling these issues head on.

As we prepare to overcome these obstacles, I have identified key areas of focus that leverage the scale and reach of NCI. These areas of focus, which permeate all sections of this *Annual Plan and Budget Proposal*, are to:

- Develop the workforce of cancer investigators
- Reaffirm our commitment to basic science to drive novel approaches and technologies
- Innovate the design, administration, and analyses of clinical trials
- Increase data aggregation and interpretation to speed work across the cancer enterprise

The pages that follow reveal a promising future for cancer research. These are times of great hope and great challenge. This *Annual Plan and Budget Proposal* lays out a vision to achieve our goals at an even faster rate. With this plan, we become ever closer to fulfilling NCI's mission to help all people live longer, healthier lives.

Norman E. Sharpless, M.D.

Director
National Cancer Institute

KEY FOCUS AREAS

NCI is responsible for the full scope of cancer research—from conducting basic science on the biological mechanisms of cancer to developing prevention, early detection, and treatment approaches to improving public health and the lives of cancer survivors. Focusing on the following areas will catalyze additional progress in cancer research and take advantage of the opportunities described in this plan.



Basic Science

Reaffirm our commitment to basic science to drive novel approaches and technologies

Basic science discoveries fuel new approaches to cancer prevention, detection, and treatment across cancer types and populations.



Workforce Development

Support the cancer research enterprise by focusing on the workforce of cancer investigators

A diverse and talented workforce of cancer researchers will make the discoveries needed to better prevent, detect, and treat cancer.



Big Data

Increase data aggregation and interpretation to speed our work across the cancer enterprise

Harnessing the power of large and diverse scientific and clinical datasets holds incredible promise to accelerate research and improve patient care.



Clinical Trials

Fully realize the power of clinical trials through innovative design, administration, and analyses

Clinical trials are a fundamental means for making progress in cancer care. Enhancing cancer clinical trials will mean that the success of new cancer interventions can be determined more rapidly.

PROFESSIONAL JUDGMENT BUDGET PROPOSAL FISCAL YEAR 2020

(Dollars in millions)

FISCAL YEAR 2018 NCI BASE APPROPRIATION	\$5,665	
TOTAL BUDGET INCREASE Proposed Allocation	\$662[†]	\$322 Inflation Adjustment* \$70 Understanding the Mechanisms of Cancer \$70 Preventing Cancer \$30 Detecting & Diagnosing Cancer \$85 Treating Cancer \$50 Advancing Public Health in Cancer \$35 Strengthening the Cancer Research Enterprise
FY 2020 BASE BUDGET PROPOSAL	\$6,327	
FY 2020 CANCER MOONSHOTSM FUNDING	\$195	
FY 2020 TOTAL	\$6,522	

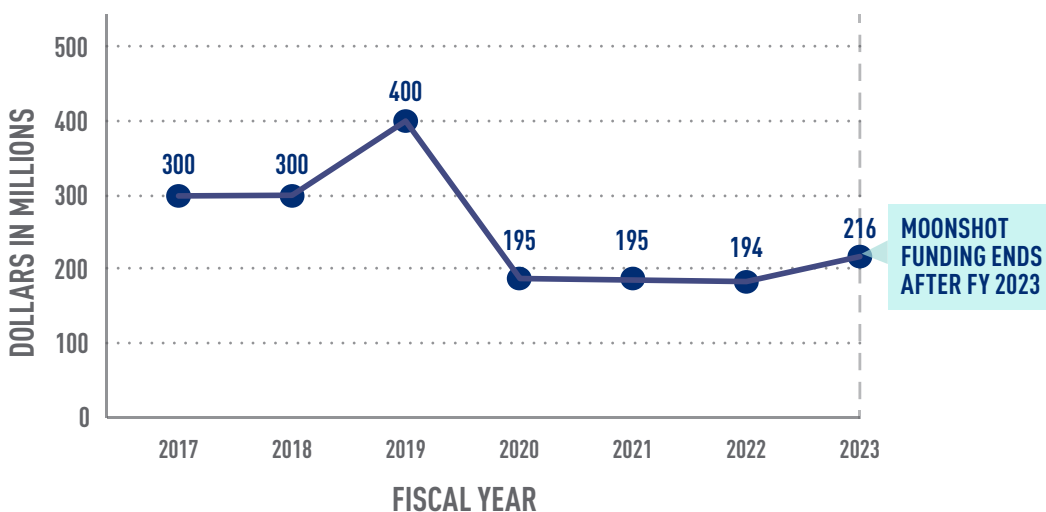
This Fiscal Year 2020 Professional Judgment Budget Proposal includes investments in six areas needed to advance cancer research. Included in this investment is a significant increase to the Research Project Grants (RPG) pool, one of the best ways to support investigator-initiated science. Early-stage investigators will continue to be a high priority within the RPG pool.

NCI will also increase funding to support clinical trials through meaningful investments in the National Clinical Trials Network and the NCI Community Oncology Research Program. NCI will support additional funding for training grants and professional development opportunities to support the next generation of diverse researchers throughout their careers. Other increases include those for the Specialized Programs of Research Excellence and the NCI Cancer Research Data Ecosystem.

This budget proposal also includes Cancer Moonshot funding authorized in the 21st Century Cures Act. As funding for the Cancer Moonshot peaks in FY 2019 and declines by more than half in FY 2020, an increase to the overall budget will ensure that research keeps pace with the progress made so far through the Cancer Moonshot. This budget proposal lays the foundation for promising advances in cancer research. However, further investments will need to be made to ensure this progress is sustained.

* Adjustment includes inflation for the 2 years between FY 2018 and FY 2020
[†] In addition to the inflation adjustment, the increase of \$662 million includes \$340 million for additional cancer research in six areas

Cancer Moonshot Funding Authorized Under the 21st Century Cures Act



RESEARCH OPPORTUNITIES

Building on the momentum made in the past few decades requires support for the entire continuum of cancer research, from basic science to survivorship. The budget proposal for FY 2020 includes investments in major areas of research needed to advance progress for adults and children with cancer and for those at risk of the disease.

UNDERSTANDING THE MECHANISMS OF CANCER

Virtually all major advances against cancer had their origins in NCI-funded basic research. Our knowledge of many fundamental mechanisms of cancer, however, remains incomplete. Continued investments in basic science will enable a comprehensive understanding of cancer biology to catalyze the development of newer and safer ways to prevent, detect, diagnose, and treat cancer. Promising areas of opportunity in basic research include creating 4-dimensional maps of human tumors to better understand tumor development and evolution, investigating the role of microbiomes in cancer, and determining the role of aging in cancer.

PREVENTING CANCER

NCI plays a critical role in cancer prevention research, which has contributed to the decreasing age-adjusted cancer incidence rate in the United States. Many opportunities exist to build on this research so that, in the future, every person's cancer risk will be known and effectively reduced. Fully characterizing a person's genetics and environmental exposures holds the promise of personalized prevention and screening strategies. To do this, more research is needed to better understand the biology of precancerous lesions and their progression to cancer, and to develop new biological and behavioral approaches to cancer prevention.

DETECTING & DIAGNOSING CANCER

NCI-supported research has improved cancer detection and diagnosis, resulting in better clinical guidelines for cancer screening and novel technologies. Being able to detect and diagnose cancer and its precursors at the earliest possible stage will ensure that fewer people will suffer and die from this disease. Identifying and validating biomarkers for early detection and diagnosis and improving cancer imaging technologies are some areas in which additional investment will enable more progress.

TREATING CANCER

NCI-funded research has fueled the development of new classes of drugs and improvements in traditional treatment approaches for children and adults with cancer. Yet more basic, translational, and clinical research must be conducted if all patients are to have safe and effective treatments in the future. More research to develop precision immunotherapies, improve strategies to overcome drug resistance, and develop novel drug discovery approaches will build on progress in cancer treatment.

ADVANCING PUBLIC HEALTH IN CANCER

NCI's efforts to study cancer on a population-wide scale have informed policies and programs to reduce cancer risk, incidence, and mortality and improve the quality of life of survivors. Yet, progress has not been uniform for all cancer types and population groups, and many cancer survivors experience serious late effects of the disease and its treatment. Areas in need of additional investment include reducing cancer disparities and improving symptom management and cancer screening in survivors of cancer.

STRENGTHENING THE CANCER RESEARCH ENTERPRISE

NCI leads the nation's cancer research enterprise. This endeavor involves training the next generation of cancer researchers, coordinating clinical trials infrastructure, and providing shared resources for the cancer research community. Opportunities exist to further strengthen our ability to discover and develop new and better ways to prevent, detect, and treat cancer in the future. These areas include increasing funding opportunities for early-stage investigators, enhancing NCI-funded clinical trials, and leading the aggregation, harmonization, and sharing of cancer research and clinical data.