



Annual Plan & Budget Proposal for Fiscal Year 2021

At a Glance

DIRECTOR'S MESSAGE: BUILDING ON SUCCESS, MAXIMIZING OPPORTUNITIES

The year 2021 will mark the 50th anniversary of the National Cancer Act of 1971, the landmark legislation that intensified support for cancer research in the United States. The investment sparked a biomedical revolution that has led to extraordinary progress in our understanding of the causes of cancer and its progression, as well as in our ability to prevent, diagnose, and treat the disease.

Over the last 5 decades, mortality rates have declined for most cancers, largely due to improvements in prevention, detection, and treatment. These advances have been fueled by breakthrough studies of complex environmental and genetic interactions that can lead to cancer, the identification of targets that drive cancer, and the development of effective interventions against those targets.

We have been able to make these strides thanks to continuing congressional support for NCI and strong engagement from academic, advocacy, patient, nonprofit, and commercial sectors. And additional funds provided through the Cancer MoonshotSM beginning in fiscal year (FY) 2017 are serving as a catalyst for further progress.

Nonetheless, cancer remains a formidable problem, and too many patients with cancer still face a grim prognosis. Each minute in the United States, more than three people are diagnosed with the disease and approximately one person dies from it. In addition, survivors can face serious cancer-related health issues.



Douglas R. Lowy, M.D., NCI Acting Director

Researchers grapple with many unanswered questions: Why do many cancers initially respond to therapy and later become resistant? How can we reduce serious long-term side effects for survivors of childhood and adult cancers? How can we ensure that high-quality cancer care is available to all who need it?

Meeting these and myriad other challenges requires sustained and robust investment in all areas of cancer research, from exploration of the causes and biological mechanisms of cancer to prevention, detection, treatment, and survivorship.

NCI's research strategy includes supporting investigator-initiated research and maximizing opportunities in emerging areas of science. The *Annual Plan & Budget Proposal for Fiscal Year 2021* focuses on three emerging areas: the immune system and microbiome, artificial intelligence, and implementation science. There are many more areas that need to be addressed as well.

Our investments must not only support cutting-edge research but also strengthen the infrastructure that enables innovation and trains a diverse and talented workforce for the important work ahead.

An unprecedented enthusiasm has permeated the research community. We are buoyed by the explosion of new research ideas, as evidenced by a 50% increase in grant applications to NCI over the past 5 years and the extraordinary number of new cancer drug approvals, which offer more options and hope to patients.

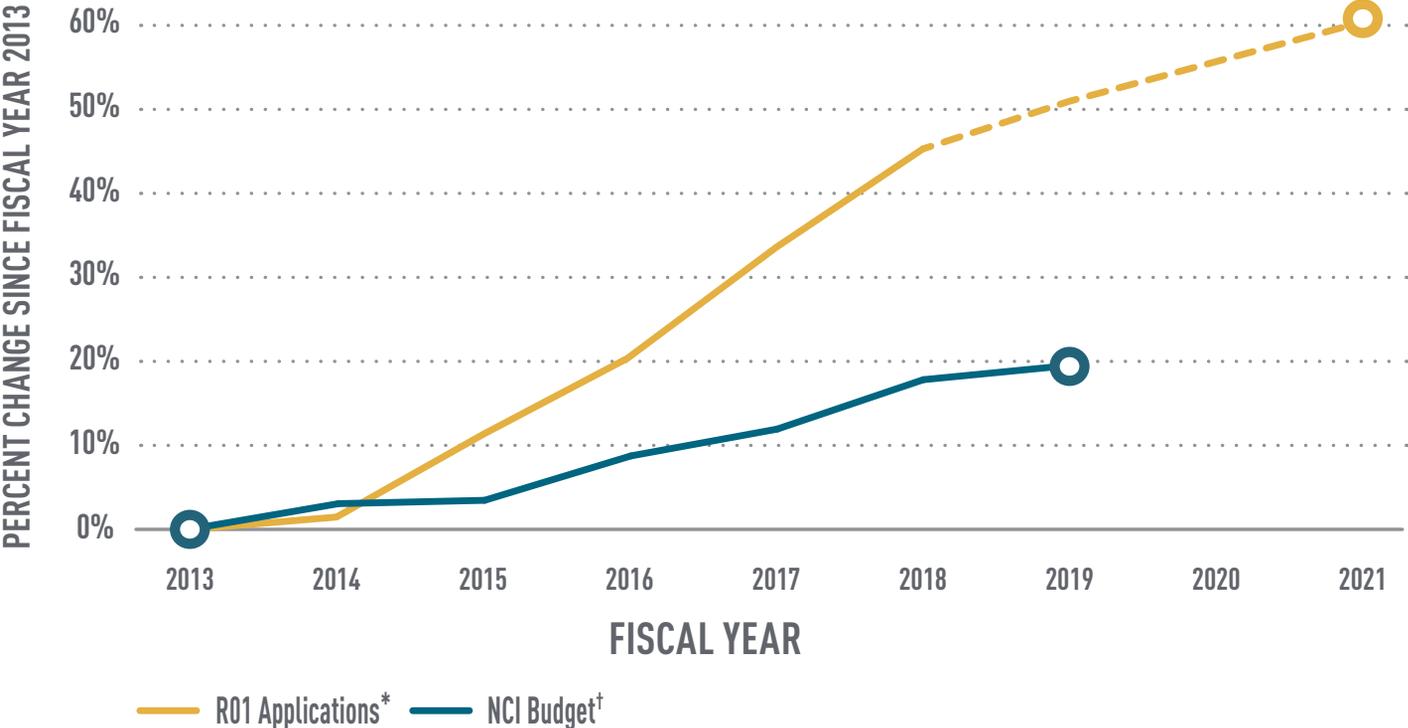
But if our budgets are unable to meet the pace of this growing interest and enthusiasm, we will be confronted with a serious challenge. If discouraged researchers leave the field, we will squander the tremendous momentum and innovation alive in the research community today. There can be no pause button for cancer research.

Today's investments lay the foundation for tomorrow's breakthroughs, just as today's advances were built on earlier discoveries made since the National Cancer Act was signed into law. We must intensify our pursuit of better outcomes for patients and their loved ones. We owe them nothing less. The *NCI Annual Plan & Budget Proposal* lays out how.

Douglas R. Lowy, M.D.

Acting Director
National Cancer Institute

Increase in NCI R01 Grant Applications Outpacing NCI Budget



* Applications for FY13–18 are from NIH RePORT, FY19 is based on the number of applications received to date, and FY20–21 applications are modeled based on the rate of growth between FY18–19

KEY MESSAGES

We are witnessing a dramatic increase in new ideas and investigators coming into the field, as evidenced by the nearly 50% increase in R01 grant applications submitted to NCI from FY 2013 to FY 2018. (Applications to the rest of NIH grew by less than 5% over the same time period.) The growth is expected to continue.

Strong congressional support led to the nearly 20% increase in NCI's

budget (in current dollars) over the same time period. Yet even this has not kept pace with the rise in scientific opportunity. NCI paylines and success rates decreased, and highly meritorious research proposals are going unfunded.

The budget proposal for FY 2021 would give NCI the flexibility to begin improving the payline for R01 grants from the current 8th percentile to the 15th. Doing so

would allow a greater number of meritorious applications to be funded. This funding would fuel more discoveries, enable more innovative minds to focus on cancer, and provide more opportunities to translate knowledge into better ways to prevent, detect, and treat the disease.

Early-stage investigators will continue to be a high priority.

SCIENTIFIC PRIORITIES

NCI's overarching strategy focuses on supporting a broad portfolio of research. Tackling the problem of cancer from many different angles will enable a future where:



UNDERSTANDING THE MECHANISMS OF CANCER

Researchers have a comprehensive understanding of cancer biology that catalyzes the development of new ways to prevent, detect, diagnose, and treat cancer



PREVENTING CANCER

More cancers are prevented because a person's cancer risk will be known and reduced effectively



DETECTING AND DIAGNOSING CANCER

Fewer people suffer and die from cancer because the disease and its precursors can be detected and diagnosed at the earliest possible stage



TREATING CANCER

All patients with cancer have safe and effective treatments



ADVANCING PUBLIC HEALTH IN CANCER

All population groups benefit equally from advances in cancer research



STRENGTHENING THE CANCER RESEARCH ENTERPRISE

Training and infrastructure enable cutting-edge research to succeed

EMERGING AREAS

The following areas represent just a few of the many scientific opportunities that, with further investment, would catalyze additional progress in cancer research.



The Immune System and Microbiome

Tapping the potential of the innate immune system and investigating how microbiomes shape the immune system and cancer development, progression, and response to treatment



Artificial Intelligence

Accelerating cancer research and improving cancer care by leveraging the power of big data and advancements in computing technologies



Implementation Science

Finding the best ways to integrate proven, effective cancer interventions into routine health settings so that all patients receive high-quality care

PROFESSIONAL JUDGMENT BUDGET PROPOSAL FOR FY 2021

(dollars in millions)

FISCAL YEAR 2019 NCI BASE APPROPRIATION	\$5,744	
TOTAL BUDGET INCREASE Proposed Allocation [§]	\$989	\$314 Inflation Adjustment[‡] \$115 Understanding Cancer \$180 Preventing Cancer \$105 Detecting & Diagnosing Cancer \$180 Treating Cancer \$65 Advancing Public Health in Cancer \$30 Training & Infrastructure
FY 2021 BASE BUDGET PROPOSAL	\$6,733	
FY 2021 CANCER MOONSHOTSM FUNDING	\$195	
FY 2021 TOTAL	\$6,928	

Immense opportunities exist in cancer research along the continuum from basic research to survivorship. This budget proposal for FY 2021 includes investments in six areas needed to advance progress in cancer as well as support for the infrastructure and training that enables cutting-edge research to succeed.

The budget proposal also includes \$50 million for the Childhood Cancer Data Initiative as well as Cancer Moonshot funding, which was authorized in the 21st Century Cures Act. Cancer Moonshot funding ends in FY 2023.

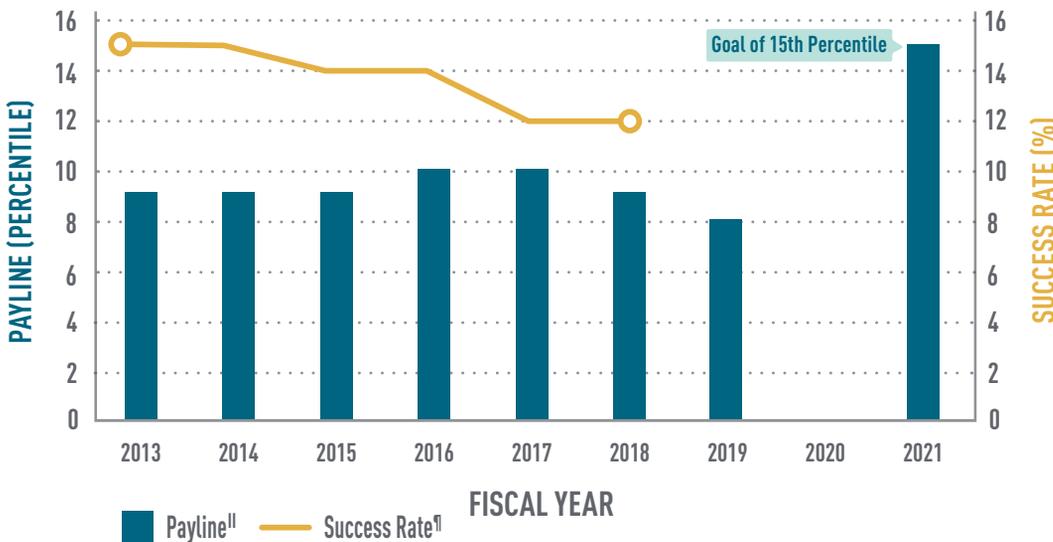
Included in this investment is a substantial increase to the budget for R01 research project grants, one of the main ways NCI supports investigator-initiated science.

The increase in high-quality research applications has far outpaced the NCI budget and our ability to fund them at an acceptable success rate. The FY 2018 success rate for NCI applications was 12%, while the rate for the rest of NIH was 22%.

The budget proposal for FY 2021 would give NCI the flexibility to begin improving the payline for R01 grants from the current 8th percentile to the 15th. This would enable funding for additional meritorious research proposals and allow us to act on more opportunities to prevent, detect, and treat cancer.

‡ Adjustment includes inflation for the 2 years between FY 2019 and FY 2021
 § In addition to the inflation adjustment, the increase of \$989 million includes \$50 million for the Childhood Cancer Data Initiative and \$625 million for additional cancer research in six areas

Paylines & Success Rates for NCI R01 Applications Remain Low



|| Payline is the preset funding cutoff point used to fund unsolicited grants (Source: NCI Budget Fact Book)

¶ Success rate is the percentage of peer-reviewed grant applications that receive funding (Source: NCI Funding Patterns)