



Annual Plan & Budget Proposal for Fiscal Year 2023

At a Glance

DIRECTOR'S MESSAGE: IT'S TIME TO END CANCER AS WE KNOW IT

In the 50 years since the National Cancer Act of 1971 was signed into law, we have made remarkable progress in cancer research. Cancer death rates have declined 31% since their peak in 1991. In fact, the rate of decline has accelerated in recent years. We've also seen record numbers of Food and Drug Administration approvals for cancer treatments emerge from decades of fundamental research and exciting new technologies that have created new opportunities across the spectrum, from prevention to diagnosis to treatment to survivorship. Even COVID-19 could not stop us.

These advances have led us into a golden age of cancer research. If we harness the promise of this golden age, we can end cancer as we know it. This means transforming the tragedy of cancer, especially in younger and otherwise healthy people. A major step on our path toward this goal would be to cut the cancer death rate in half from its peak in the 1990s. I believe we will do this, and I believe we'll get there soon.

It has been the National Cancer Institute's work to create the structures that enable this progress, and our current work is poised to accelerate the pace of research progress. Progress-enabling efforts take many forms and include supporting foundational basic research, training the next generation of cancer



Norman E. Sharpless, M.D., NCI Director

caregivers and researchers, and providing the data infrastructure and data sets needed for research. NCI also works across the federal government to support the development of policies that support cancer care and research.

Examples of key infrastructure include the Cancer Research Data Commons and Childhood Cancer Data Initiative. These linked efforts offer access to clinical and molecular data and research tools that have unleashed opportunities for studies that were never possible before. In addition, the Cancer MoonshotSM has enabled us to create interdisciplinary teams that work together to lead and spread the reach of cutting-edge research, such as immunotherapy approaches for children and adults. With Cancer Moonshot funding drawing to a close at the end of fiscal year (FY) 2023, we will look for ways to sustain this bold effort that has accelerated progress in cancer research.

To end cancer as we know it will require sustained strong investments and team-based efforts. Advances in our understanding and treatment of cancer are built on foundational research, which is largely supported through grants for investigator-initiated projects. It is therefore essential that NCI achieves its goal to increase the fraction of applications that can be funded to the top 15th percentile of R01 applications by FY 2025. Research project grants, including R01 grants, are the source of some of the most innovative and transformative ideas in cancer research. This investment would increase the number of meritorious research proposals NCI funds and ensure that we take advantage of the recent boom in applications from new investigators entering the field.

Without robust and sustained budget increases, paylines cannot be raised, and we would miss out on many great ideas that could advance cancer research.

President Biden's goal is to end cancer as we know it for all Americans, regardless of race, ethnicity, or income. To achieve this, NCI is fully committed to promoting health equity in all our work. We will ramp up our efforts to grow a more diverse and inclusive cancer research workforce and foster a culture in which everyone flourishes. NCI has long been a leader in supporting research on cancer disparities, and we will build on that strong tradition to ensure that reducing disparities remains a priority throughout our research.

VCU Massey Cancer Center's Dr. Vanessa Sheppard, a cancer survivor and researcher highlighted in this *Annual Plan & Budget Proposal*, typifies the kind of researchers we believe will help us overcome cancer disparities. She champions the approach that "we must embed community voices in what we do" and that through dialogue we can increase much-needed cancer screenings and clinical trial participation in these communities.

Looking to the future, we have highlighted four scientific opportunities in this *Annual Plan & Budget Proposal* that would greatly accelerate progress:

- For people with cancer, participating in a clinical trial should offer hope, not additional burdens to bear. We have the opportunity to bring clinical trials to more people, no matter where they live, by making it possible for them to enroll in their own communities and by using the latest technology, including telemedicine.
- Far too many people face cancers for which there are no effective treatments. Computer-based drug design could dramatically speed up drug discovery and, ultimately, help shorten the 10 to 15 years it typically takes for a new medicine to complete its journey from initial discovery to patient benefit.
- Precision prevention offers the promise of personalized prevention and screening approaches tailored to a person's individual cancer risk based on their genetic makeup, family history, environmental exposures, and behavioral factors.
- The staggering complexity of tumors makes it difficult to predict how a person's cancer will progress or respond to treatment. We plan to use the latest technologies, such as artificial intelligence, to enhance the study of tumor dynamics to help learn why some tumors evolve into malignant cancers, how they progress, and why they either respond to or resist therapy.

The proposed Advanced Research Projects Agency for Health (ARPA-H) would be a great partner to help realize the scientific opportunities before us. Pairing NCI's world-class basic and translational research expertise with ARPA-H's envisioned capability to foster rapid innovation at unprecedented scale would surely save more lives.

Thanks to the progress we have achieved since the National Cancer Act of 1971, the hope of ending cancer as we know it may finally be within our reach—not just for a few, or even many, but for *all* people. Because of the hard work and dedication of researchers and clinicians like Dr. Sheppard, continued support from Congress, and our partnership with patients, survivors, and their loved ones, I know we can achieve our goal.

Norman E. Sharpless, M.D.

Director
National Cancer Institute

SCIENTIFIC OPPORTUNITIES

NCI drives advances in cancer by investing in a broad portfolio of research, from basic science to survivorship. In addition to supporting long-established areas of research, NCI pursues new and emerging scientific opportunities. The following areas represent just a few of the many areas that, with further investment, will catalyze more progress in cancer research.



CLINICAL TRIALS

Ending cancer as we know it means reimagining the clinical trial enterprise so that clinical research is available to participants wherever they are. With additional investments, NCI can support more research to expand telemedicine into clinical trials, increase access to trials for underserved communities, and incorporate methods that simplify enrollment and data collection.



COMPUTER-BASED DRUG DESIGN

A future with safe and effective medicines that are available for every patient would end cancer as we know it. Additional investments in computational methods that rapidly screen billions of molecules for targeted interactions could speed drug discovery dramatically. This approach could produce a greater number of cancer drugs that work more effectively to save lives with fewer toxic side effects.



PRECISION PREVENTION

A precision approach to prevention could end cancer as we know it by limiting suffering and death for those at risk and helping others avoid unnecessary tests and treatments. Imagine determining a person's cancer risk by assessing their genetic makeup, family history, environmental exposures, and behaviors and then tailoring personalized prevention approaches based on these factors. Accomplishing this goal requires a deeper understanding of the causes of cancer and cancer biology.



TUMOR DYNAMICS

Ending cancer as we know it includes a future in which we can predict a tumor's trajectory based on a detailed profile of each patient's disease and develop personalized approaches to care. Addressing the complexity of cancer will require additional investments in basic research, coupled with resources including tumor atlases and advances in computer science and molecular techniques.

KEY MESSAGES

NCI is committed to investigator-initiated research.

The FY 2023 budget proposal would enable NCI to increase R01 paylines to the 13th percentile, allowing NCI to fund a greater number of meritorious applications. Robust and sustained investments are needed to achieve the 15th percentile R01 payline by FY 2025.

NCI is seizing new opportunities in cancer research and building on progress in established areas.

Beyond NCI's broad research portfolio, opportunities include expanding access to clinical trials, improving cancer drug design, understanding tumor dynamics, and advancing precision prevention. In addition to funding research project grants, investments are needed across a multitude of programs, including the NCI-Designated Cancer Centers and clinical trials networks that help translate scientific discoveries into new approaches for patients.

NCI's goal is to make health equity a priority in everything we do.

NCI will ramp up its commitment to building a diverse and inclusive cancer research workforce and support disparities research to ensure advances in cancer research benefit all people.

NCI seeks to sustain and leverage the unprecedented opportunities and progress created by the Cancer Moonshot once funding ends after FY 2023.

In its 7 years, the Cancer Moonshot will have initiated many new networks and established an infrastructure to conduct cancer research and share resources on a massive scale.

PROFESSIONAL JUDGMENT BUDGET PROPOSAL FOR FISCAL YEAR 2023

(DOLLARS IN MILLIONS)

FISCAL YEAR 2021 NCI BASE APPROPRIATION	\$6,365*	
TOTAL BUDGET INCREASE (Proposed Allocation)	\$1,185†	\$277 Inflation Adjustment†† \$165 Cancer Biology Research \$185 Cancer Prevention Research \$150 Cancer Detection & Diagnosis Research \$205 Cancer Treatment Research \$125 Public Health & Cancer Control Research \$78 Training & Infrastructure
FY 2023 BUDGET RECOMMENDATION	\$7,550	
FY 2023 CANCER MOONSHOT SM FUNDING	\$216	
FY 2023 TOTAL	\$7,766	

With cancer research that spans the continuum from basic science to survivorship, we have an incredible opportunity to greatly reduce the impact of cancer on people's lives and end cancer as we know it. This budget proposal for FY 2023 invests in the cutting-edge research, infrastructure, and training needed to harness these opportunities so that researchers better understand how to prevent and treat cancer.

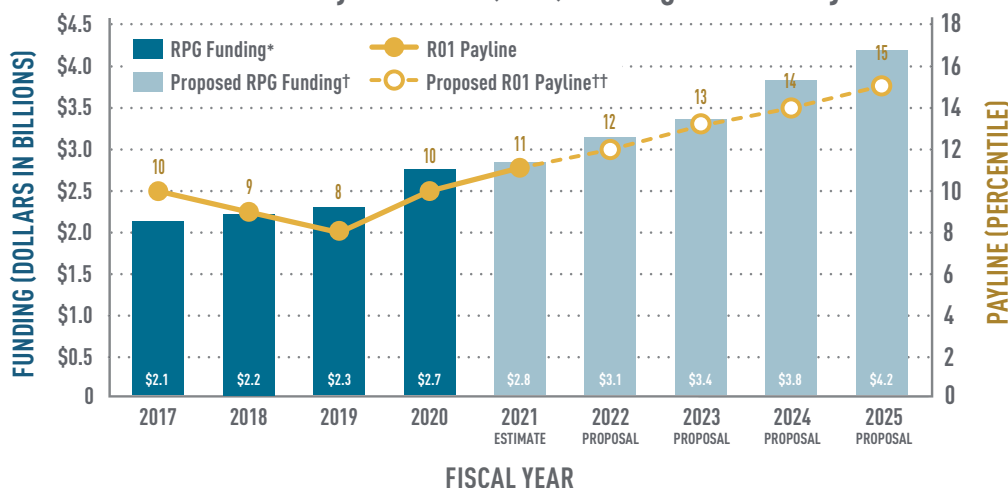
This budget proposal advances progress toward NCI's goal of increasing the payline—that is, the percentile of applications NCI can fund—for research project grants (RPGs) and expands opportunities for early-stage investigators. The proposal also includes \$50 million for the Childhood Cancer Data Initiative and \$216 million for the final dedicated year of Cancer MoonshotSM funding.

Beyond funding for RPGs, some of NCI's other key investments include: the NCI-Designated Cancer Centers, the Specialized Programs of Research Excellence (SPOREs), and practice-changing clinical trial programs that enroll patients at over 2,500 academic and community sites across the country.

Across all our programs, NCI will make it a priority to address cancer disparities and grow a more diverse and inclusive cancer research workforce.

- * The base appropriation includes \$50 million for the 4th year of the Childhood Cancer Data Initiative, a 10-year initiative that began in FY 2020.
- † The increase of \$1,185 million includes an inflation adjustment and \$908 million for additional infrastructure and cancer research in six major focus areas.
- †† This adjustment includes inflation for the 2 years between FY 2021 and FY 2023.

NCI Research Project Grants (RPG) Funding and R01 Paylines



- * RPG funding levels include program evaluation and Small Business Innovation Research.
- † FY 2021 reflects an estimate, and FY 2022 through FY 2025 are proposed professional judgment budget levels. Estimates beyond FY 2020 are subject to change due to unanticipated inflation rates, average cost increases, and fluctuations in application rates as the country recovers from the COVID-19 pandemic.
- †† R01 paylines for FY 2022 through FY 2025 are proposed levels based on estimated funding levels included in this professional judgment budget.