NCI Director's Report

Norman E. Sharpless, M.D.

9th Virtual Meeting of the Frederick National Laboratory Advisory Committee

February 24, 2022

@NCIDirector
@TheNCI

NIH NATIONAL CANCER INSTITUTE

HEALTH

50 years ago this week President Nixon signed the National Cancer Act

December 22, 2021 · 5:10 AM ET
Heard on Morning Edition

GABRIELLE EMANUEL

npr FROM wbur

6-Minute Listen + PLAYLIST

Five decades ago, the National Cancer Act became law. What did it take for ca
go from an unmentionable disease to among the most visible and best-funde
medicine?

News > Kaiser Health News

The War on Cancer at 50: The Origin Begins With a Socialite Citizen-Lobbyist

Gabrielle Emanuel, WBUR
January 06, 2022

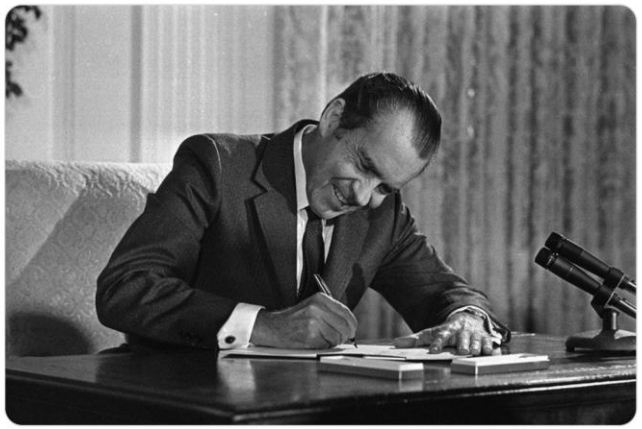
KHN KAISER HEALTH NEWS

FDA Oncology
@FDAOncology

OCE Director Richard Pazdur, MD, writes about 50 years of progress in treating patients with cancer since the National Cancer Act of 1971 increased the nation's commitment to cancer research & drug development.
#ConversationsOnCancer
#NothingWillStopUs
bit.ly/3ISFcLR

The ASCO Post
@ASCOPost

How the National Cancer Act of 1971 Revolutionized Cancer Care and What Lies Ahead: Celebrating 50 Years of Cancer Progress: Conversations With Seven Cancer Care Experts ascopost.com/issues/may-25-...
#cancercare #NothingWillStopUs



USA TODAY

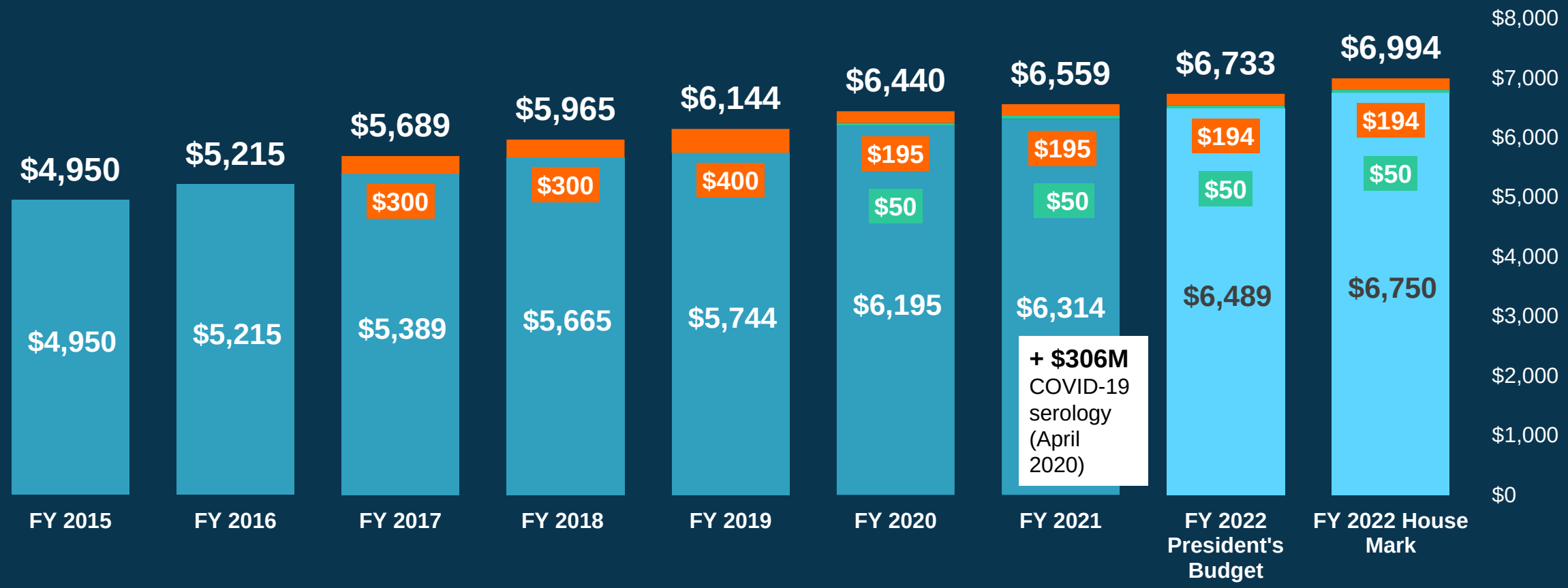
Karen Weintraub
USA TODAY

Published 5:30 a.m. ET Dec. 23, 2021 | Updated 10:28 a.m. ET Dec. 23, 2021

50 years after the US declared war against cancer, the fight continues. These are the 10 biggest victories.

NCI Appropriations FY 2015 – 2022 (in millions)

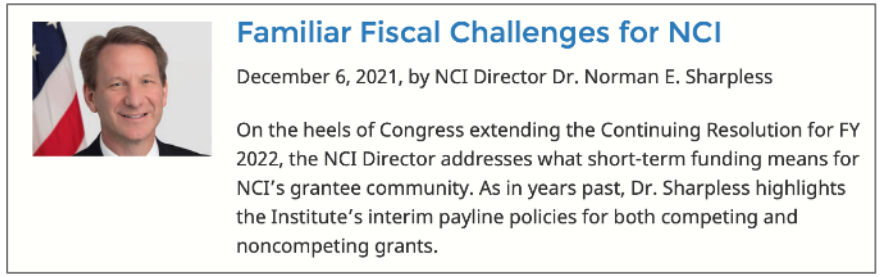
21st Century Cures Act - orange
Childhood Cancer Initiative - green



FY 22 Continuing Resolution expires March 11.

NCI Interim Paylines for FY 2022

GRANT TYPE	INTERIM PAYLINE
R01 Grants for Established and New Investigators	**9th Percentile**
R01 Grants for Early-Stage Investigators (ESIs)	**14th Percentile**
R21 Exploratory Grants	**9th Percentile**
Non-competing grants will be funded at **90%** during this period of uncertainty.	



Opinion

A $1-Billion Boost to the NCI Will Help Us Beat Cancer

The organization's underfunding means critical research is not being done

Scientific American – December 28, 2021

> We must work together to treat cancer with the same urgency that we tackled the pandemic—starting with a **robust, sustained investment in cancer research through the National Cancer Institute** (NCI).

Senator Chris Coons
Delaware (D)

Senator Jerry Moran
Kansas (R)

Ending cancer as we know it

BY CARYN LERMAN, PH.D., AND ROBERT A. WINN, MD, OPINION CONTRIBUTORS — 02/17/22 08:00 AM EST
THE VIEWS EXPRESSED BY CONTRIBUTORS ARE THEIR OWN AND NOT THE VIEW OF THE HILL

The Hill – February 17, 2022

> Cancer is projected to cost the U.S. $245 billion by 2030…**Now is the time for Congress to invest in cancer research to support the president's plan to end cancer as we know it**. We all stand to benefit.

Caryn Lerman
President, AACI

Robert A. Winn
VP and
President-Elect, AACI

"I'm proud to announce our plan to supercharge the Cancer Moonshot as a central effort of the Biden-Harris administration... This is a presidential priority. I will do my part on funding and using my authority as president to speed breakthroughs. I challenge and encourage all of you to do your part."

— President Joe Biden (February 2, 2022)

AP NEWS

Biden aims to reduce cancer deaths by 50% over next 25 years

abc NEWS

Biden relaunches cancer 'moonshot' initiative to help cut death rate

NEWS WATCH NOW

Revamped 'Cancer Moonshot' could prevent deaths and improve quality of life for survivors

Science

Biden's 'reignited' Cancer Moonshot would develop blood tests to detect cancer and vaccines to prevent it

First Lady Jill Biden and NCI Work Together on ‘Returning to Screening’

Photo credits: Twitter / Ruben A. Mesa, Moffitt Cancer Center, White House / Ana Isabel Martinez Chamorro, Marquel Coaxum

BRIEFING ROOM

A New Chapter for the White House Office of Science and Technology Policy

FEBRUARY 17, 2022 • OSTP BLOG

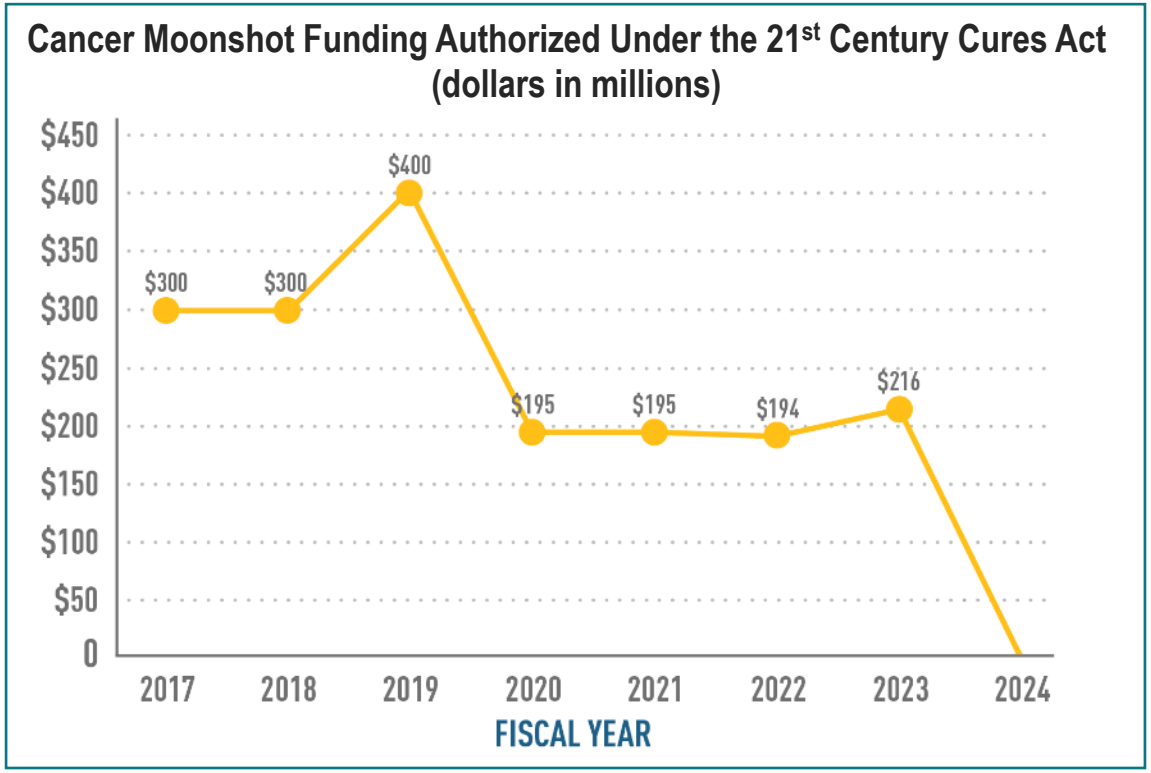
Commitment to a Safe and Respectful Workplace at NIH

"An environment where people feel **welcome, respected, and valued** is critical to enable all individuals to contribute to their fullest potential.

Our continued growth toward this goal is grounded in the **expectation that all employees respect one another in their workplace interactions**."

Lawrence A. Tabak, D.D.S., Ph.D.
Acting Director, NIH
February 10, 2022

Cancer Moonshot℠



The Cancer Moonshot has three ambitious goals: to **accelerate scientific discovery in cancer**, **foster greater collaboration**, and **improve the sharing of data**.

Ending Cancer As We Know It

DIAGNOSE CANCER SOONER

Increase access to screening, support patients through diagnosis, evaluate new technologies like multi-cancer detection tests

PREVENT CANCER

Explore mRNA technology, address environmental exposures to cancer

ADDRESS INEQUITIES

Ensure every community in the nation has access to diagnostics, therapeutics, and clinical trials

TARGET TREATMENTS TO THE RIGHT PATIENTS

Learn more about genetics, immune responses, and other factors, to tell which combination of treatments will work best in an individual patient

SPEED PROGRESS AGAINST DEADLIEST & RAREST CANCERS

Invest in a robust pipeline for new treatments

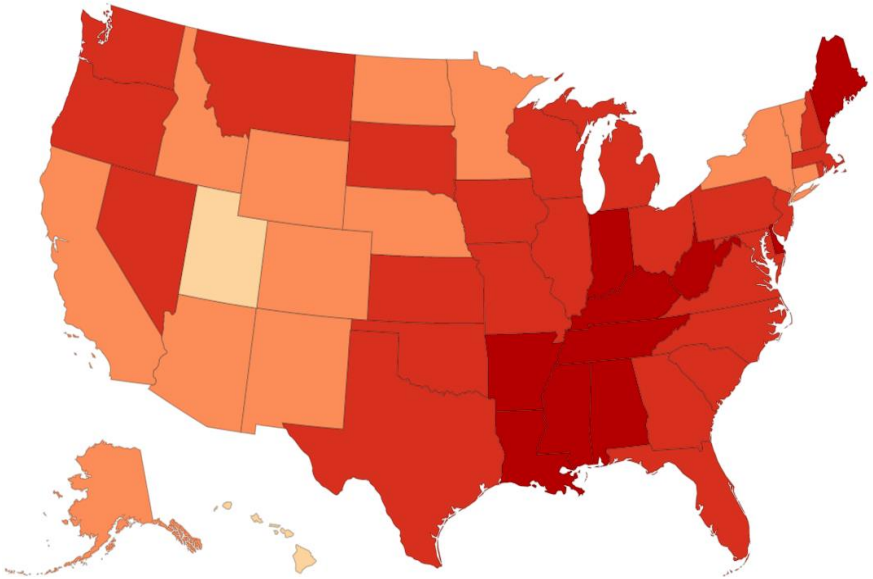
SUPPORT PATIENTS, CAREGIVERS, & SURVIVORS

Help people overcome medical, financial, and emotional burdens; provide support to navigate diagnosis, treatment, and survivorship

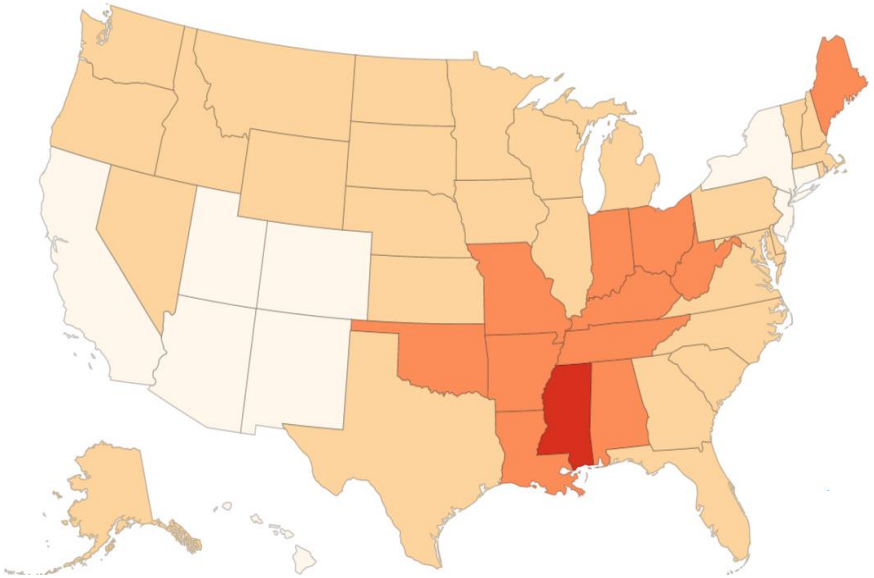
LEARN FROM ALL PATIENTS

Leverage diverse experiences of patients and families to develop approaches to end cancer as we know it

Age-Adjusted Cancer Mortality



2005



2019

Age Adjusted Rates
(per 100,000)

- 117.20 - 137.58
- 137.58 - 157.96
- 157.96 - 178.34
- 178.34 - 198.72
- 198.72 - 219.10

Source: CDC National Center for Health Statistics

New White House Cancer Mortality Goal

1990 **215** deaths per 100,000

2019 **146** deaths per 100,000

In 25 years...

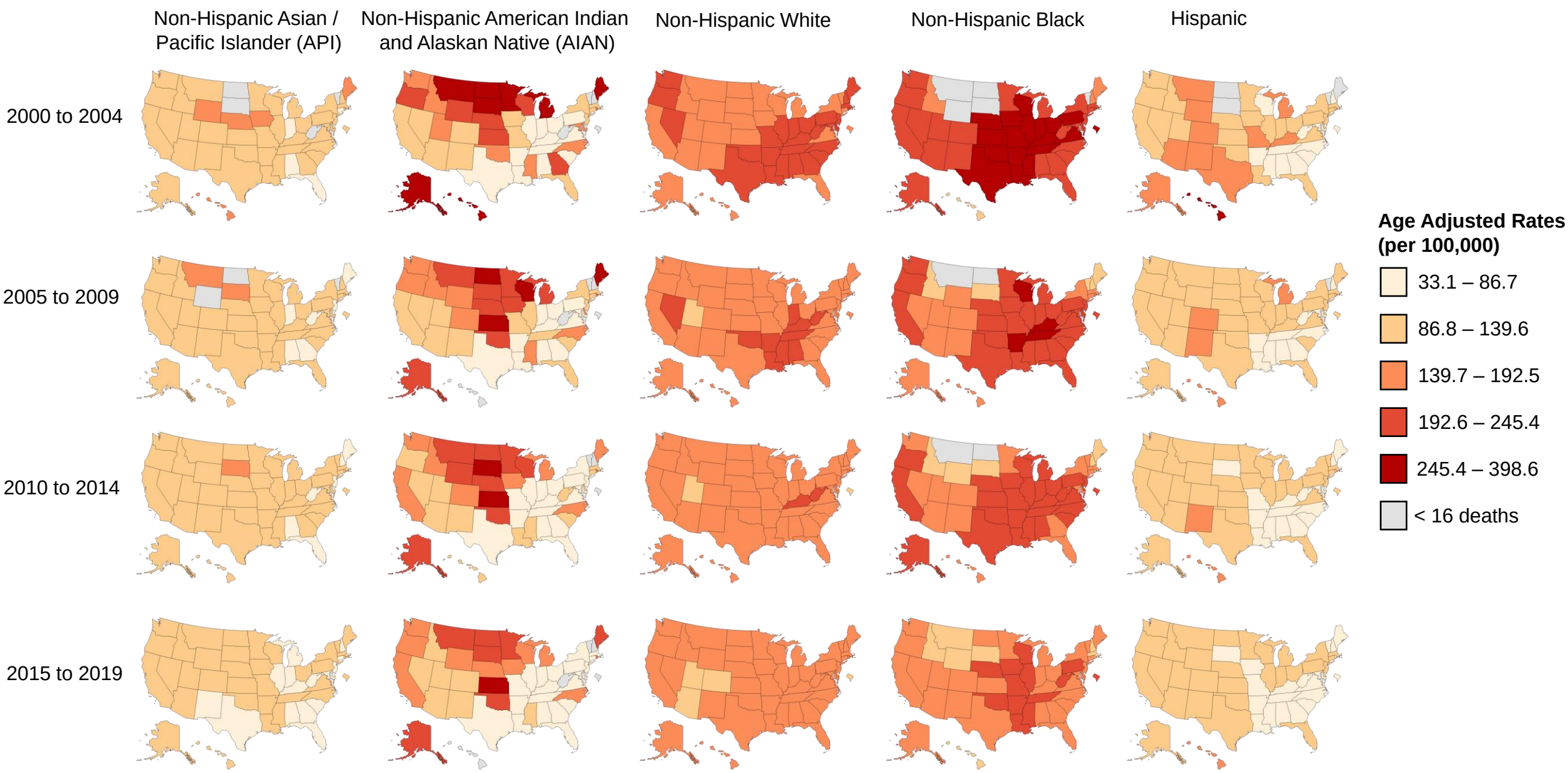
73 deaths per 100,000

"The goal is to cut the cancer death rate in half in the next 25 years."

— President Biden

Feb. 2, 2022

Mortality From All Malignant Cancers (By Race / Ethnicity)



President's Cancer Panel Report

Dr. Ned Sharpless with two of the three members of the President's Cancer Panel, Dr. Edith Mitchell and Dr. John Williams (Chair). Not pictured: Robert Ingram

Closing Gaps in Cancer Screening:

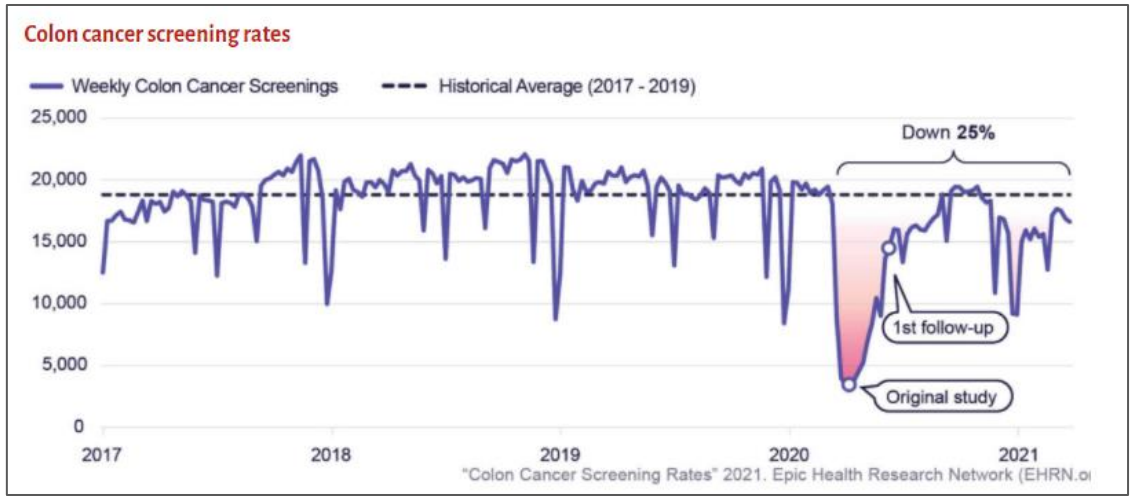
Connecting People, Communities, and Systems to Improve Equity and Access

"…more **effective and equitable implementation of cancer screening** represents a significant opportunity for the National Cancer Program, with potential to accelerate the decline in cancer deaths and, in some cases, prevent cancer…"

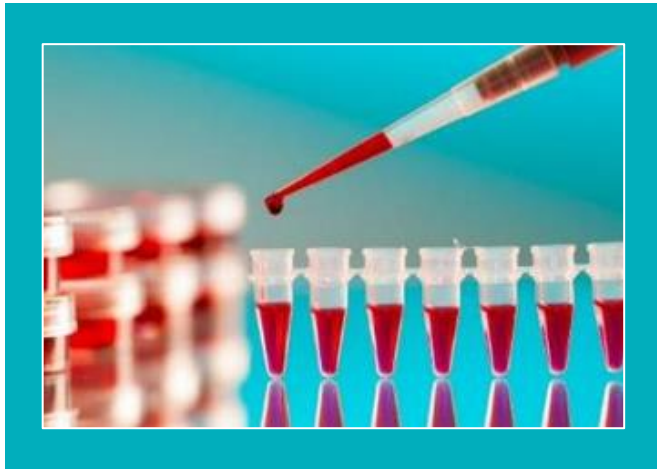
Call to Action on Cancer Screening

"Americans have missed more than 9 million cancer screenings in the last two years because of COVID. Nine million. We have to get cancer screenings back on track and make sure that they are accessible to all Americans."

President Joe Biden
February 2, 2022



Blood-based multi-cancer detection tests (MCDs)



OUTSTANDING QUESTIONS

Can MCD tests detect many subclinical cancers at early stage **and reduce mortality?**

How safe is an MCD-negative test result?

What are the rates of false-positive/negative results, and of finding indolent cancers (overdiagnosis)?

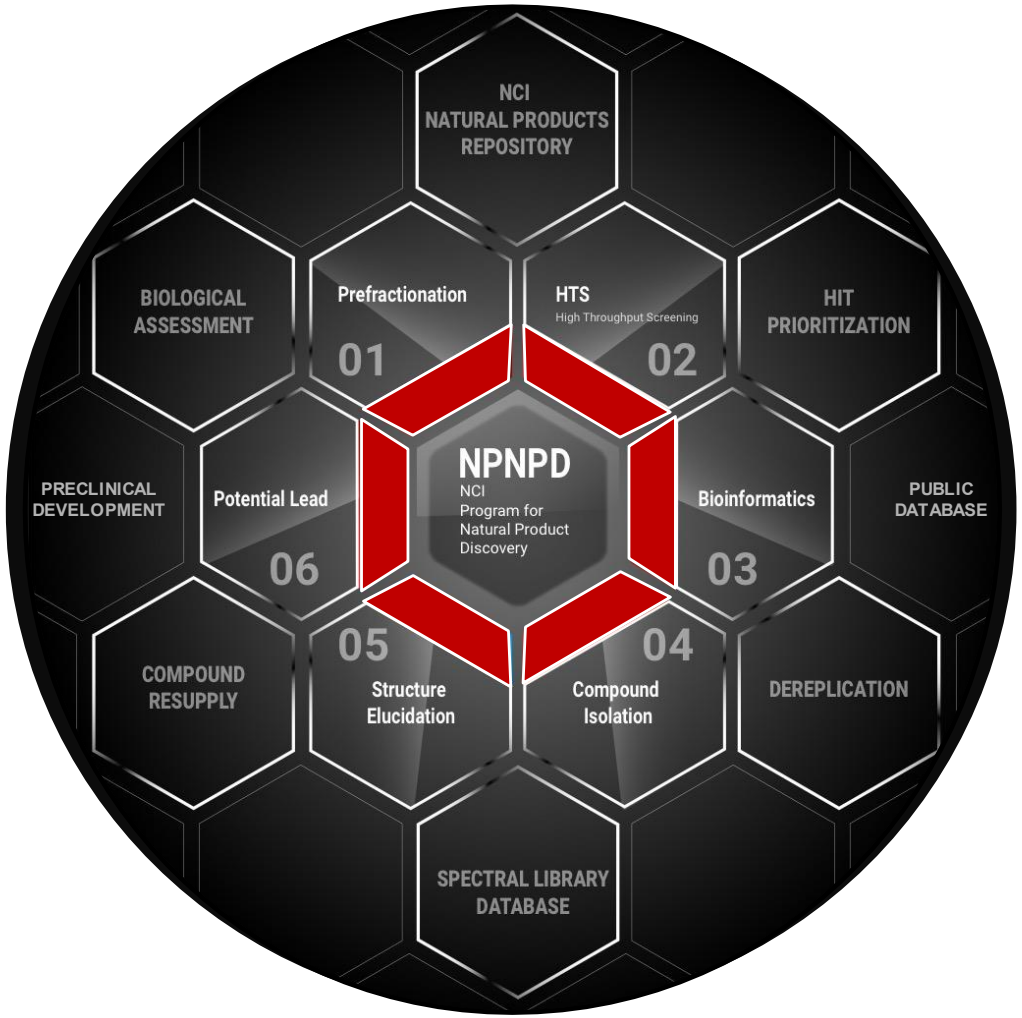
Request for Information (RFI)

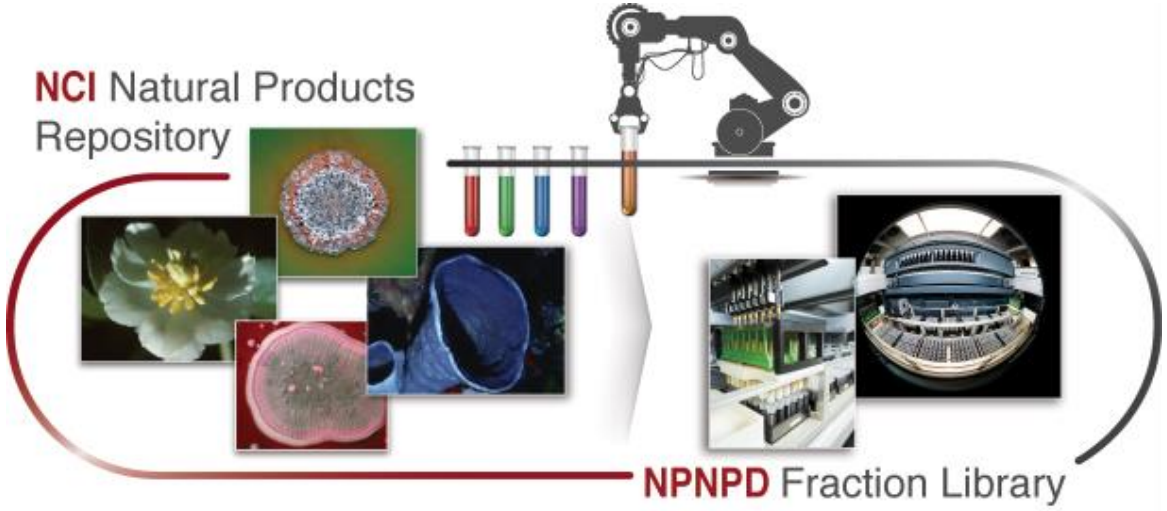
Seeking Input from Multi-Cancer Early Detection Test Developers on Readiness for Participation in an NCI-Sponsored Clinical Utility Randomized Controlled Screening Trial

Notice Number: **NOT-CA-22-033**

Responses accepted through
March 1, 2022

The NCI Program for Natural Product Discovery





- **Joint effort of Division of Cancer Treatment and Diagnosis + Center for Cancer Research**
- **Facilitate both intramural and extramural research and address current challenges in natural product-based drug discovery**
- **Funded by the Cancer Moonshot**

Team connects genetic variant to poor outcomes after certain cancer treatment – *Lancet Oncology* (December 9, 2021)

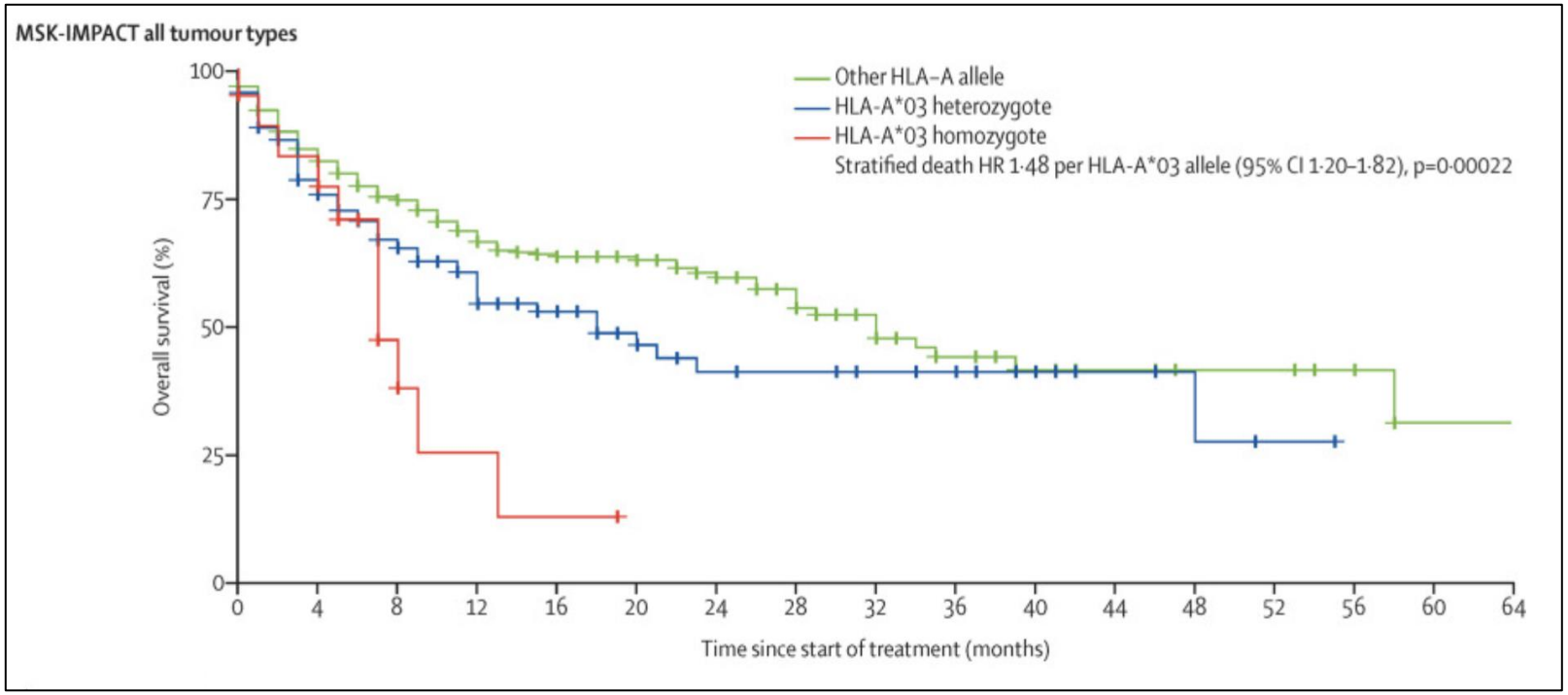


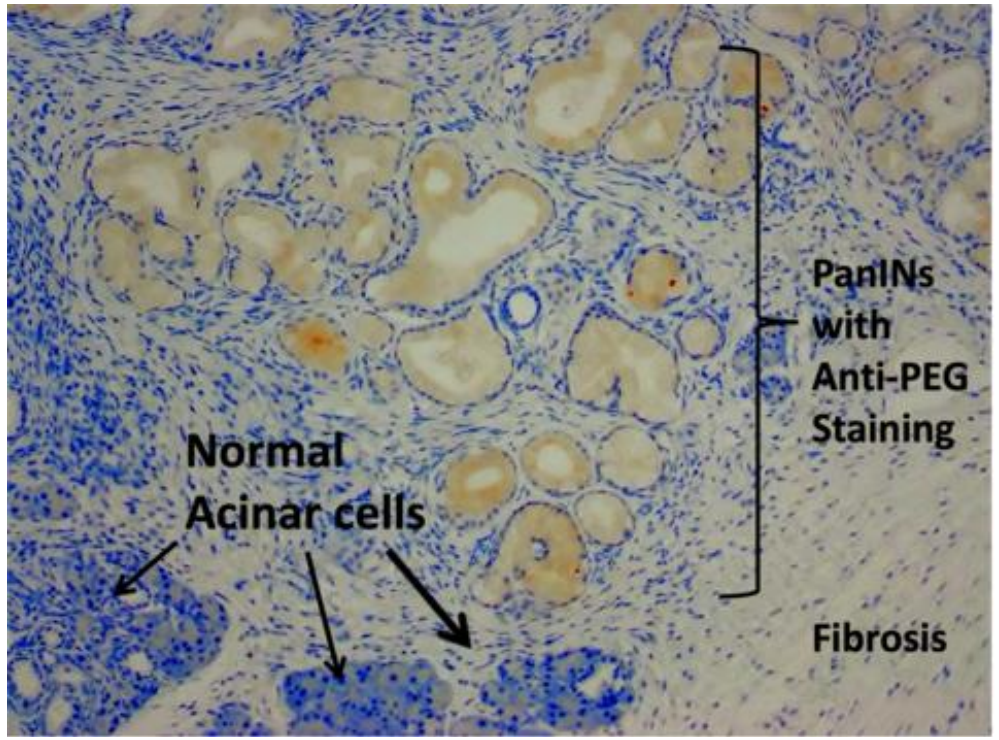
*Figure: Effect of HLA-A*03 on overall survival in MSK-IMPACT across all tumor types, stratified for tumor type*

- Presence of **HLA-A*03** associated with **ineffective immune checkpoint inhibition therapy and lower survival rates** overall, across tumor types, despite treatment.
- HLA-A*03 potentially useful screening marker to determine whether a patient should receive immune checkpoint inhibitors.

Naranbhai V, Viard M, Dean M, Groha S, Braun DA, Labaki C, Shukla SA, Yuki Y, Shah P, Chin K, Wind-Rotolo M, Mu XJ, Robbins PB, Gusev A, Choueiri TK, Gulley JL, Carrington M. HLA-A*03 and response to immune checkpoint blockade in cancer: an epidemiological biomarker study. *Lancet Oncology*. December 9, 2021

Nanotechnology enables potential novel imaging agent for early pancreatic cancer detection – *Biomolecules* (November 25, 2021)

- FNL scientists (Stephan Stern, Jill Smith, and others) **created novel imaging agent that might detect deadly pancreatic cancer at its earliest stages**
- Discovered membrane receptor CCK-BR that is overexpressed in cancer cells + precancerous lesions
- Developed a florescent nanoparticle that attaches to the CCK-BR on PanINs -> cellular accumulation of the fluorescent signal -> revealed precancerous PanINs

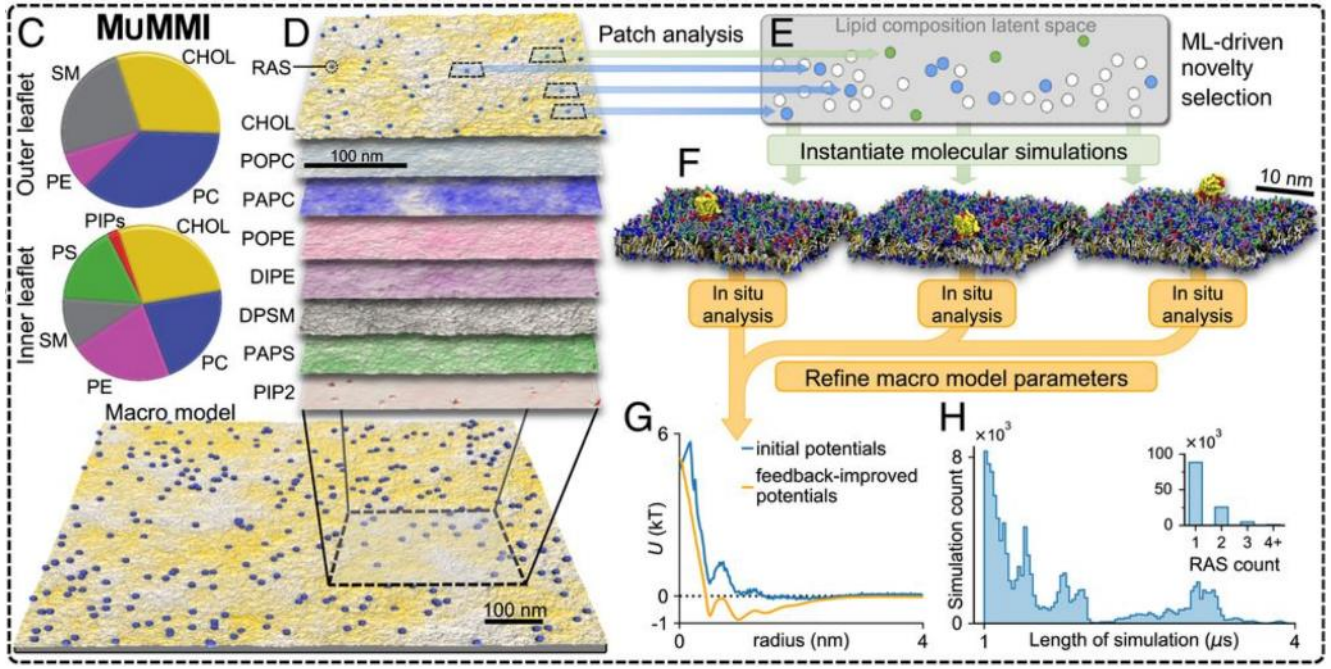


Smith JP, Cao H, Edmondson EF, Dasa SSK, Stern ST. Cholecystokinin-B Receptor-Targeted Nanoparticle for Imaging and Detection of Precancerous Lesions in the Pancreas. *Biomolecules*. November 25, 2021.

Machine learning-backed model reveals new insights about RAS biology not possible with traditional experiments

Proceedings of the National Academy of Sciences (January 4, 2022)

- Multiscale model that simulated KRAS on a complex model membrane: Multiscale Machine-Learned Modeling Infrastructure (MuMMI)
- First time such scale of analysis and machine learning used for this kind of computational biology
- Joint Design of Advanced Computing Solutions for Cancer (JDACS4C) collaboration between DOE, NCI, FNL and other organizations



Ingólfsson HI, Neale C, Carpenter TS, Shrestha R, López CA, Tran TH, Oppelstrup T, Bhatia H, Stanton LG, Zhang X, Sundram S, Di Natale F, Agarwal A, Dharuman G, Kokkila Schumacher S, Turbyville T, Gulten G, Van QN, Goswami D, Jean-Francois F, Agamasu C, Chen D, Hettige JJ, Travers T, Sarkar S, Surh MP, Yang Y, Moody A, Liu S, Van Essen BC, Voter AF, Ramanathan A, Hengartner NW, Simanshu DK, Stephen AG, Bremer PT, Gnanakaran S, Glosli JN, Lightstone FC, McCormick F, Nissley DV, Streitz FH. *Proceedings of the National Academy of Sciences*. January 4, 2022

NCI New Personnel Announcement

Dr. Brigitte Widemann

Special Advisor to the Director for Childhood Cancer

"We are living in a golden age of research and discovery.

We can end this terror, and all of us have a role to play."

First Lady Dr. Jill Biden
February 2, 2022

Discussion