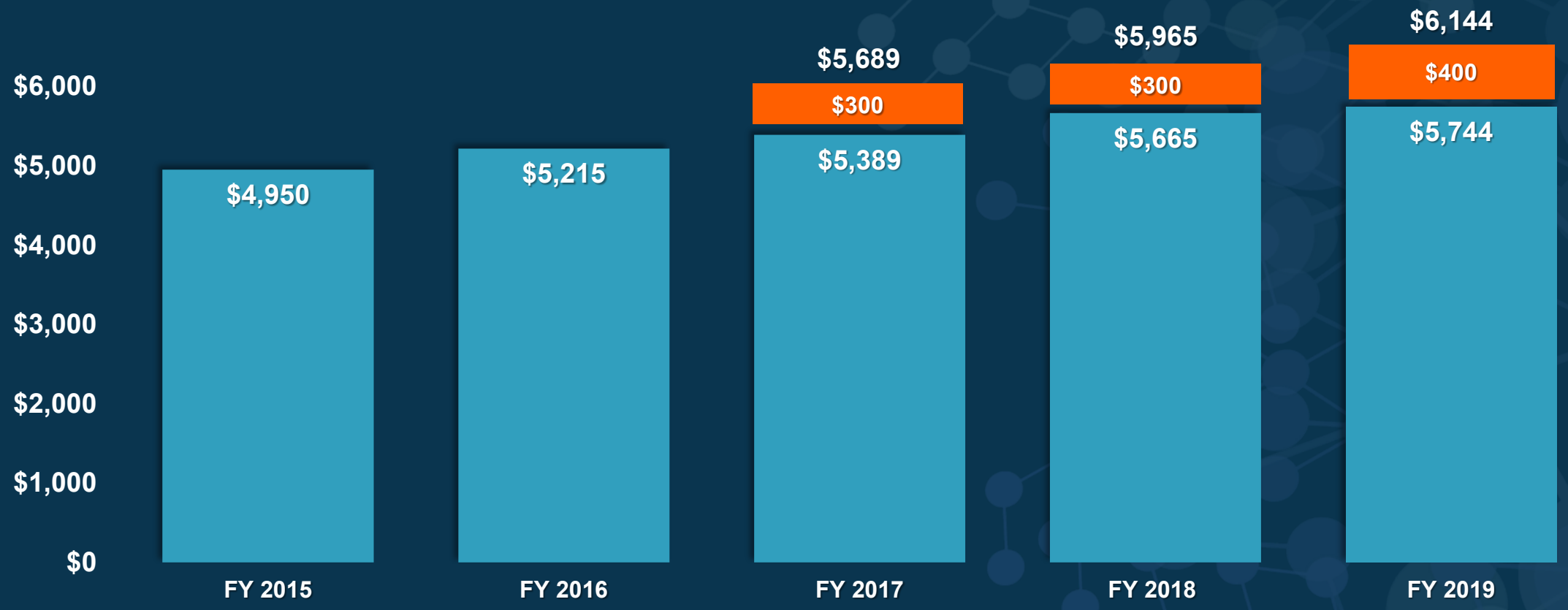
NCI Director's Update

Norman E. Sharpless, M.D.

October 29, 2018

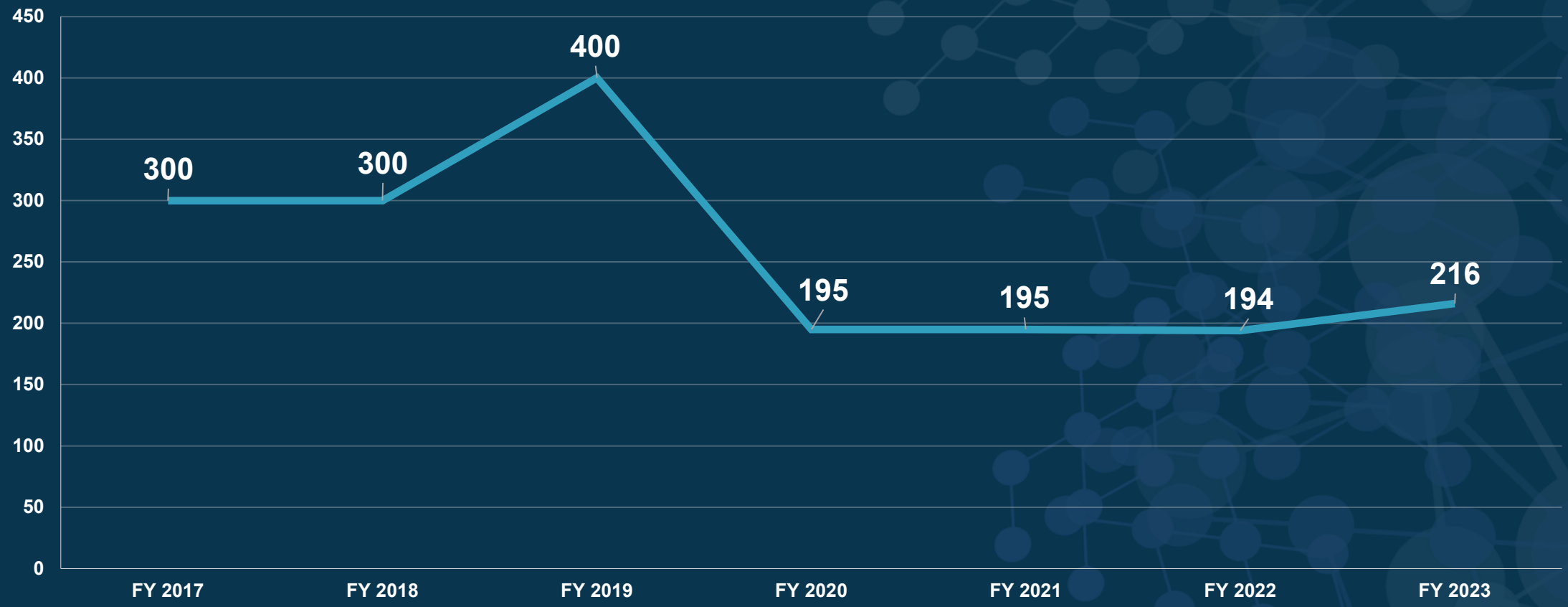
NCI Appropriations FY 2015 - 2019 (in millions)

21st Century Cures Act funding shown in orange.

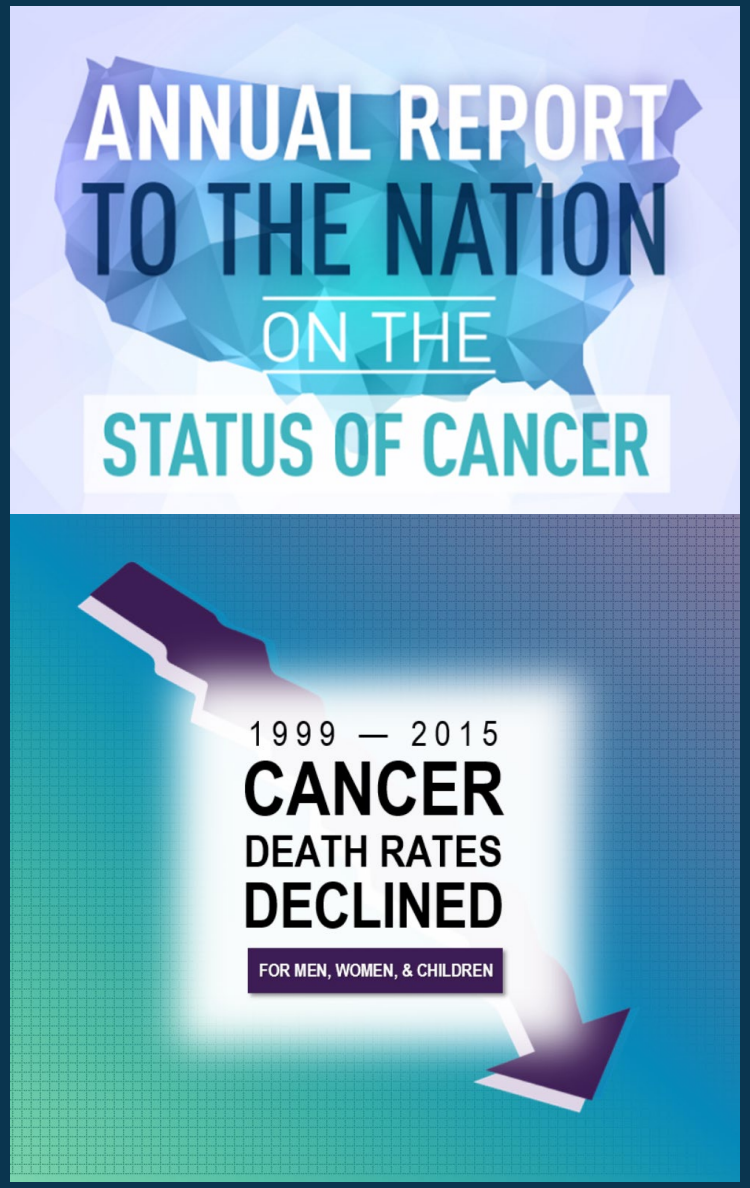


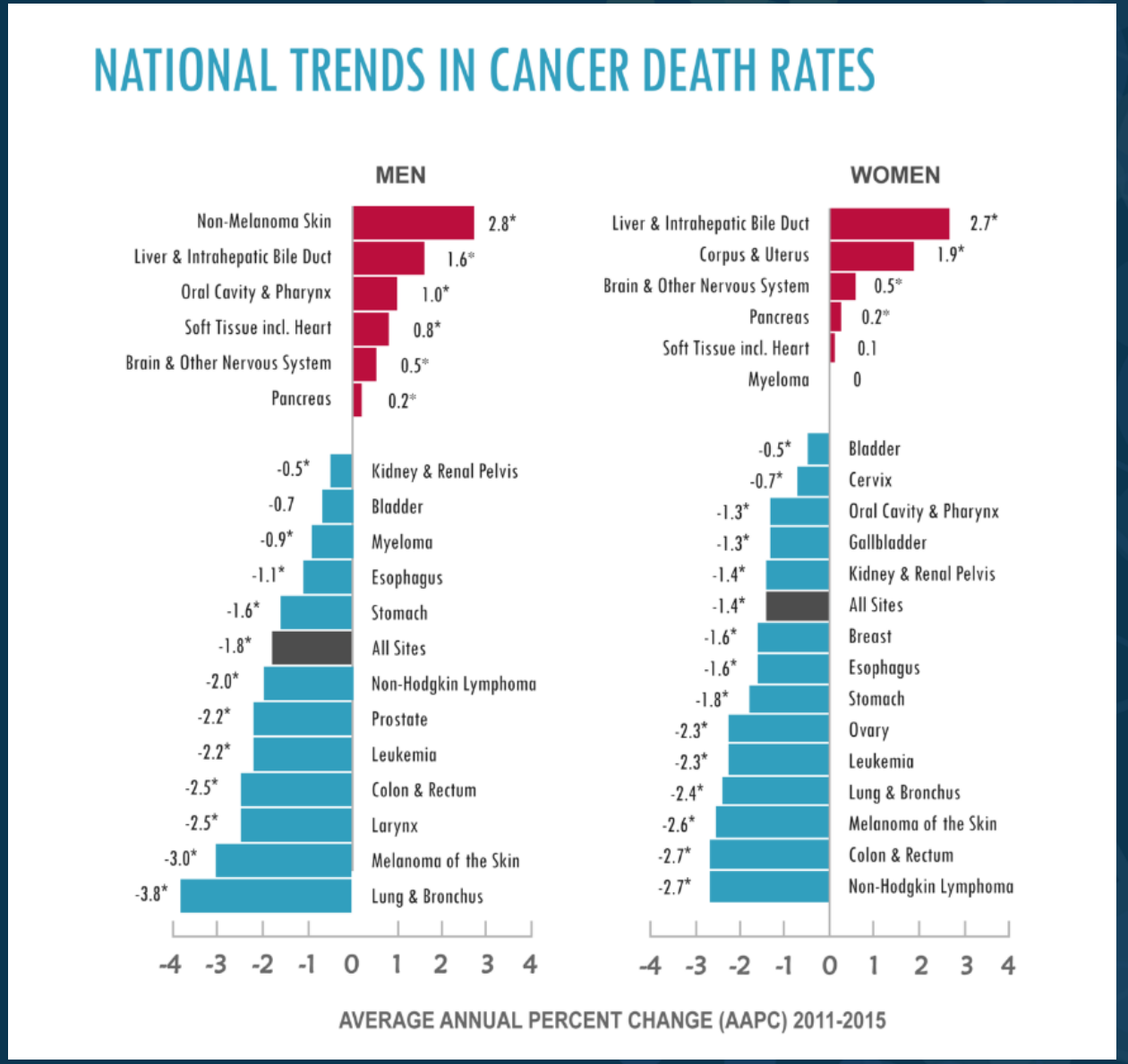
Source: NCI Office of Budget and Finance

Cancer Moonshot Funding Authorized Under the 21st Century Cures Act (dollars in millions)



Highlights of the Past Year


ANNUAL REPORT
TO THE NATION
ON THE
STATUS OF CANCER
1999 — 2015
CANCER
DEATH RATES
DECLINED
FOR MEN, WOMEN, & CHILDREN


NATIONAL TRENDS IN CANCER DEATH RATES
MEN
Non-Melanoma Skin 2.8*
Liver & Intrahepatic Bile Duct 1.6*
Oral Cavity & Pharynx 1.0*
Soft Tissue incl. Heart 0.8*
Brain & Other Nervous System 0.5*
Pancreas 0.2*
-0.5* Kidney & Renal Pelvis
-0.7 Bladder
-0.9* Myeloma
-1.1* Esophagus
-1.6* Stomach
-1.8* All Sites
-2.0* Non-Hodgkin Lymphoma
-2.2* Prostate
-2.2* Leukemia
-2.5* Colon & Rectum
-2.5* Larynx
-3.0* Melanoma of the Skin
-3.8* Lung & Bronchus
-4 -3 -2 -1 0 1 2 3 4
WOMEN
Liver & Intrahepatic Bile Duct 2.7*
Corpus & Uterus 1.9*
Brain & Other Nervous System 0.5*
Pancreas 0.2*
Soft Tissue incl. Heart 0.1
Myeloma 0
-0.5* Bladder
-0.7* Cervix
-1.3* Oral Cavity & Pharynx
-1.3* Gallbladder
-1.4* Kidney & Renal Pelvis
-1.4* All Sites
-1.6* Breast
-1.6* Esophagus
-1.8* Stomach
-2.3* Ovary
-2.3* Leukemia
-2.4* Lung & Bronchus
-2.6* Melanoma of the Skin
-2.7* Colon & Rectum
-2.7* Non-Hodgkin Lymphoma
-4 -3 -2 -1 0 1 2 3 4
AVERAGE ANNUAL PERCENT CHANGE (AAPC) 2011-2015

FY 2018 RPG POOL

Largest increase since FY 2003

FY 2018 ESIs

NCI **exceeded** its goal of funding **25% more** Early-Stage Investigators

FY 2019

FY 2019 enacted appropriation is a **$179M* increase** over FY 2018

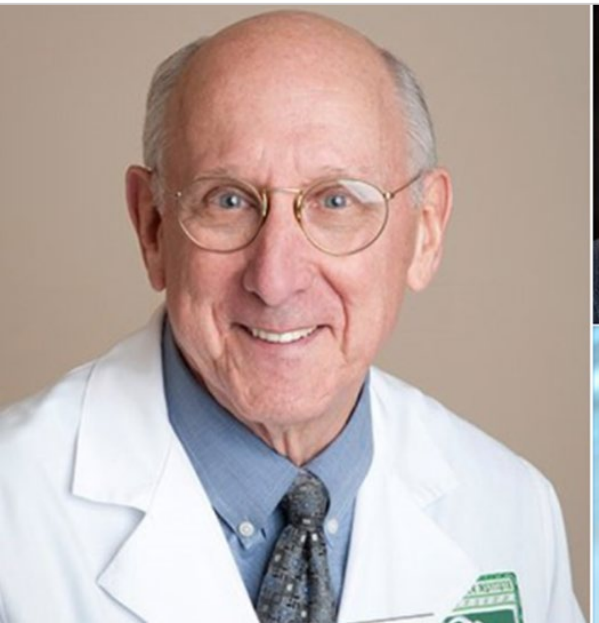
** including Moonshot funds*

The Washington Post

Democracy Dies in Darkness

Researchers use immune-cell 'army' to battle another tough cancer

By Laurie McGinley June 4 Email the author



ALBANY MEDICAL CENTER Prize in Medicine AND BIOMEDICAL RESEARCH

Newsweek

HEALTH

WHAT IS IMMUNOTHERAPY?: WOMAN WITH TERMINAL BREAST CANCER SAVED BY PIONEERING TREATMENT

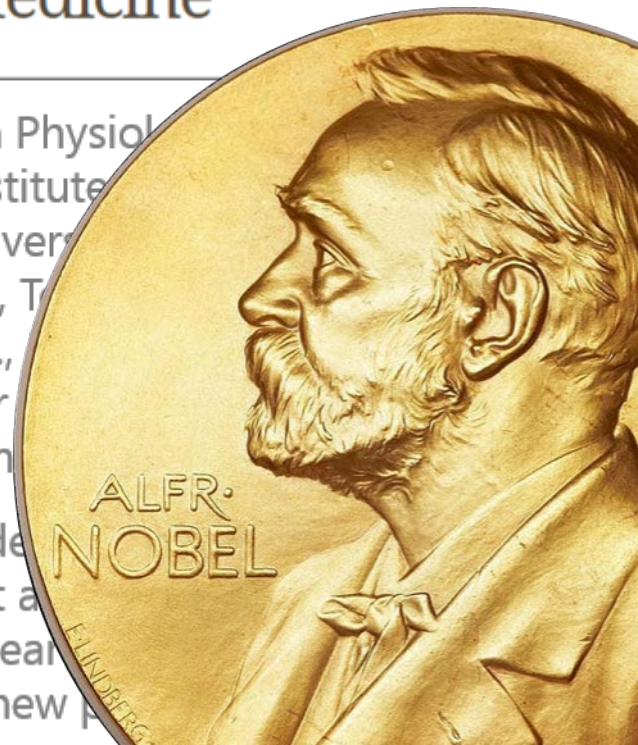
BY KASHMIRA GANDER ON 6/5/18 AT 7:03 AM

Monday, October 1, 2018

NIH grantee wins 2018 Nobel Prize in Physiology or Medicine

The 2018 Nobel Prize in Physiol
awarded to National Institute
Allison, Ph.D., of the Univers
Cancer Center, Houston, T
with Tasuku Honjo, M.D.,
Institute, Japan, for their
inhibition of negative im

The Royal Swedish Acade
stimulating the inherent a
attack tumor cells this yea
established an entirely new



TAILORx

Trial **A**ssigning **I**ndividua**L**ized **O**ptions for Treatment (**Rx**)

NCI Press Release

TAILORx trial finds most women with early breast cancer do not benefit from chemotherapy

Posted: June 3, 2018

Contact: NCI Press Office
240-760-6600

New findings from the groundbreaking Trial Assigning Individualized Options for Treatment (Rx), or TAILORx trial, show no benefit from chemotherapy for 70 percent of women with the most common type of breast cancer. The study found that for women with hormone receptor (HR)-positive, HER2-negative, axillary lymph node–negative breast cancer, treatment with chemotherapy and hormone therapy after surgery is not more beneficial than treatment with hormone therapy alone. The new data, released at the American Society of Clinical Oncology (ASCO) annual meeting in Chicago, will help inform treatment decisions for many women with early-stage breast cancer.

Credit: iStock

The trial was supported by the National Cancer Institute

FDA Approval of Moxetumomab

Moxetumomab Approved by FDA for Hairy Cell Leukemia

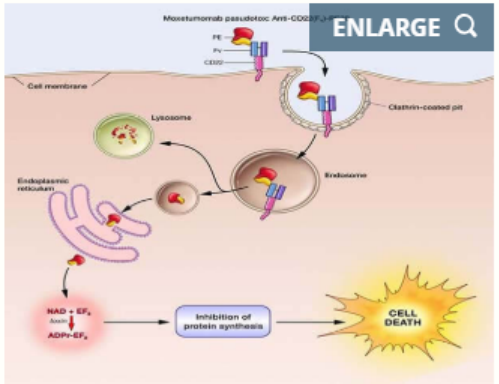
Subscribe

September 14, 2018, by NCI Staff

The Food and Drug Administration (FDA) has approved moxetumomab pasudotox (Lumoxiti), a bacterial toxin–based drug, for the treatment of some patients with hairy cell leukemia (HCL). The approval covers the use of moxetumomab in patients with HCL who have already undergone at least two lines of standard treatments.

The action by FDA makes moxetumomab the first treatment approved for this group of patients. The approval was based on the findings from an 80-patient clinical trial sponsored by the drug's manufacturer, MedImmune.

In the trial, approximately 30% of patients had a complete disappearance of their cancer (complete response) that lasted for a long period, and side effects from the therapy were few and mostly minor. Overall, 75% of patients in the trial had either a partial response or complete response.



Moxetumomab pasudotox (Moxe) binds CD22 receptors on the surface of cancerous B cells, where it is internalized and processed to release its toxic payload.
Credit: National Cancer Institute

Moxetumomab was originally discovered by Ira Pastan, M.D., and colleagues in NCI's Center for Cancer Research (CCR), and later licensed to MedImmune/AstraZeneca for clinical development.

Large retrospective study links low-dose radiation exposure to leukemia

THE LANCET
Haematology
Volume 5, Issue 8, August 2018, Pages e346-e358

Leukaemia and myeloid malignancy among people exposed to low doses (<100 mSv) of ionising radiation during childhood: a pooled analysis of nine historical cohort studies

Mark P Little, Richard Wakeford, David Borrego, Benjamin French, Lydia B Zablotska, M Jacob Adams, Rodrigue Allodji, Florent de Vathaire, Choonsik Lee, Alina V Brenner, Jeremy S Miller, David Campbell, Mark S Pearce, Michele M Doody, Erik Holmberg, Marie Lundell, Siegal Sadetzki, Martha S Linet*, Amy Berrington de González*

Summary

Background Substantial evidence links exposure to moderate or high doses of ionising radiation, particularly in childhood, with increased risk of leukaemia. The association of leukaemia with exposure to low-dose (<100 mSv) radiation is less certain, although this is the dose range most relevant to the general population. We aimed to estimate the risk of leukaemia associated with low-dose radiation exposure in childhood (age <21 years).

Methods In this analysis of historical cohort studies, we pooled eligible cohorts reported up to June 30, 2014. We evaluated leukaemia and myeloid malignancy outcomes in these cohorts with the relevant International Classification of Diseases and International Classification of Diseases for Oncology definitions. The cohorts included had not been treated for malignant disease, had reported at least five cases of the relevant haematopoietic neoplasms, and estimated individual active bone marrow (ABM) doses. We restricted analysis to individuals who were younger than 21 years at first irradiation who had mean cumulative ABM doses of less than 100 mSv. Dose-response models were fitted by use of Poisson regression. The data were received in fully anonymised form by the statistical analyst.

Lancet Haematol 2018; 5: e346-58
Published Online July 16, 2018
http://dx.doi.org/10.1016/S2352-3026(18)30092-9
See Comment page e324

*Contributed equally
Radiation Epidemiology Branch, National Cancer Institute, Bethesda, MD, USA (Prof M P Little DPhil, D Borrego PhD, C Lee PhD, A V Brenner PhD, M M Doody MS,

Notable NCI Research

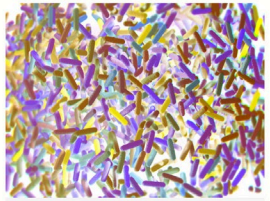
NCI Press Release

NCI study finds gut microbiome can control antitumor immune function in liver

Posted: May 24, 2018

Contact: NCI Press Office
240-760-6600

Scientists have found a connection between bacteria in the gut and antitumor immune responses in the liver. Their study, published online May 24 in *Science*, was led by researchers in the Center for Cancer Research (CCR) at the National Cancer Institute (NCI). It showed that bacteria found in the gut of mice affect the liver's antitumor immune function. The findings have implications for understanding the mechanisms that lead to liver cancer and for therapeutic approaches to treat them. NCI is part of the National Institutes of Health.



3D illustration of gut bacteria.
Credit: iStock

"What we found using different tumor models is

NCI study finds gut microbiome can control antitumor immune function in liver

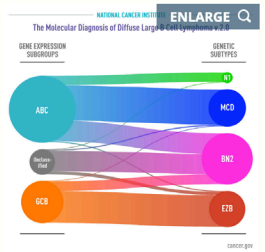
NCI Press Release

NCI study revises molecular classification for most common type of lymphoma

Posted: April 11, 2018

Contact: NCI Press Office
240-760-6600

In a new study, researchers identified genetic subtypes of diffuse large B-cell lymphoma (DLBCL) that could help explain why some patients with the disease respond to treatment and others don't. The study, led by researchers in the Center for Cancer Research (CCR) at the National Cancer Institute (NCI), part of the National Institutes of Health, with additional authors from several institutions around the world, was published online April 11, 2018, in *The New England Journal of Medicine*.



Subgroups of DLBCL by gene expression (left) defined several years ago. Genetic subtypes

"These findings are the culmination of two decades of research at NCI and elsewhere, advancing our understanding of the effect of

NCI study revises molecular classification for most common type of lymphoma

Article

Cell

Genome Organization Drives Chromosome Fragility

In this study, we show that evolutionarily conserved chromosome loop anchors bound by CCCTC-binding factor (CTCF) and cohesin are vulnerable to DNA double strand breaks (DSBs) mediated by topoisomerase 2B (TOP2B). Polymorphisms in the genome that redistribute CTCF/cohesin occupancy rewire DNA cleavage sites to novel loop anchors. While transcription- and replication-coupled genomic rearrangements have been well documented, we demonstrate that DSBs formed at loop anchors are largely transcription-, replication-, and cell-type-independent. DSBs are continuously formed throughout interphase, are enriched on both sides of strong to-

NCI study identifies potential source of genome instability

ASPirin in Reducing Events in the Elderly

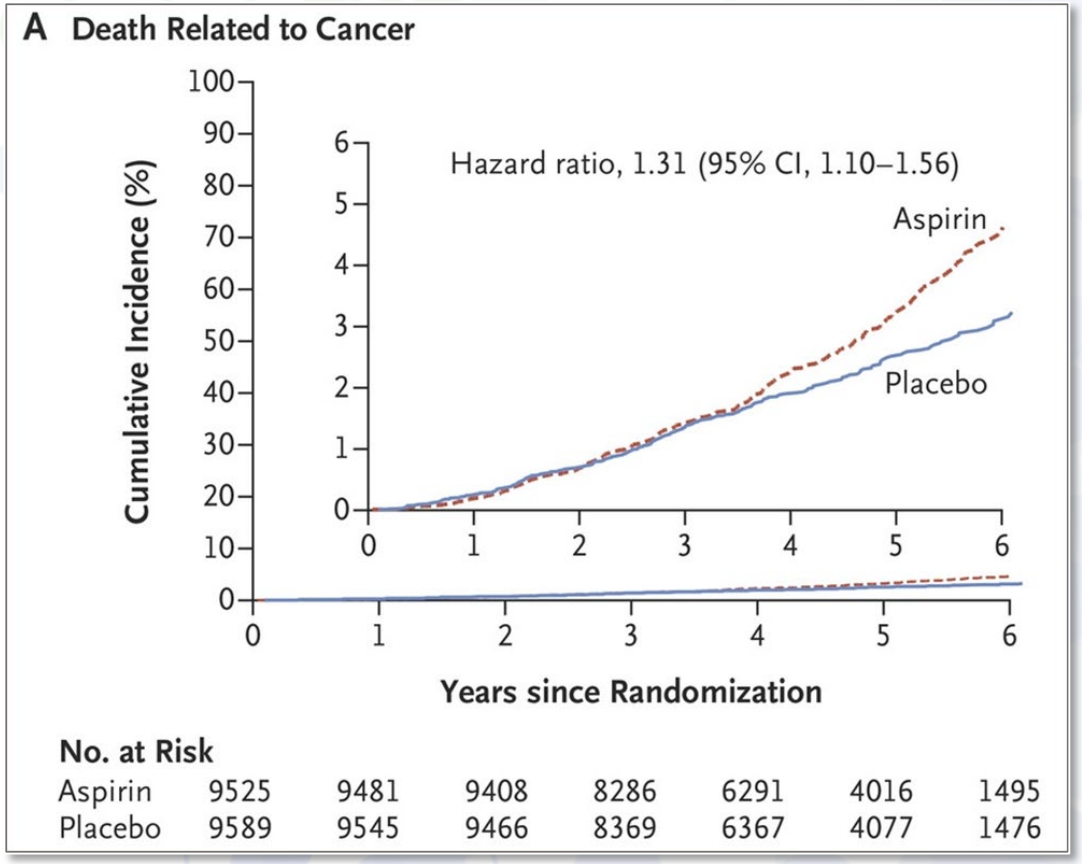
ASPREE

The NEW ENGLAND JOURNAL of MEDICINE

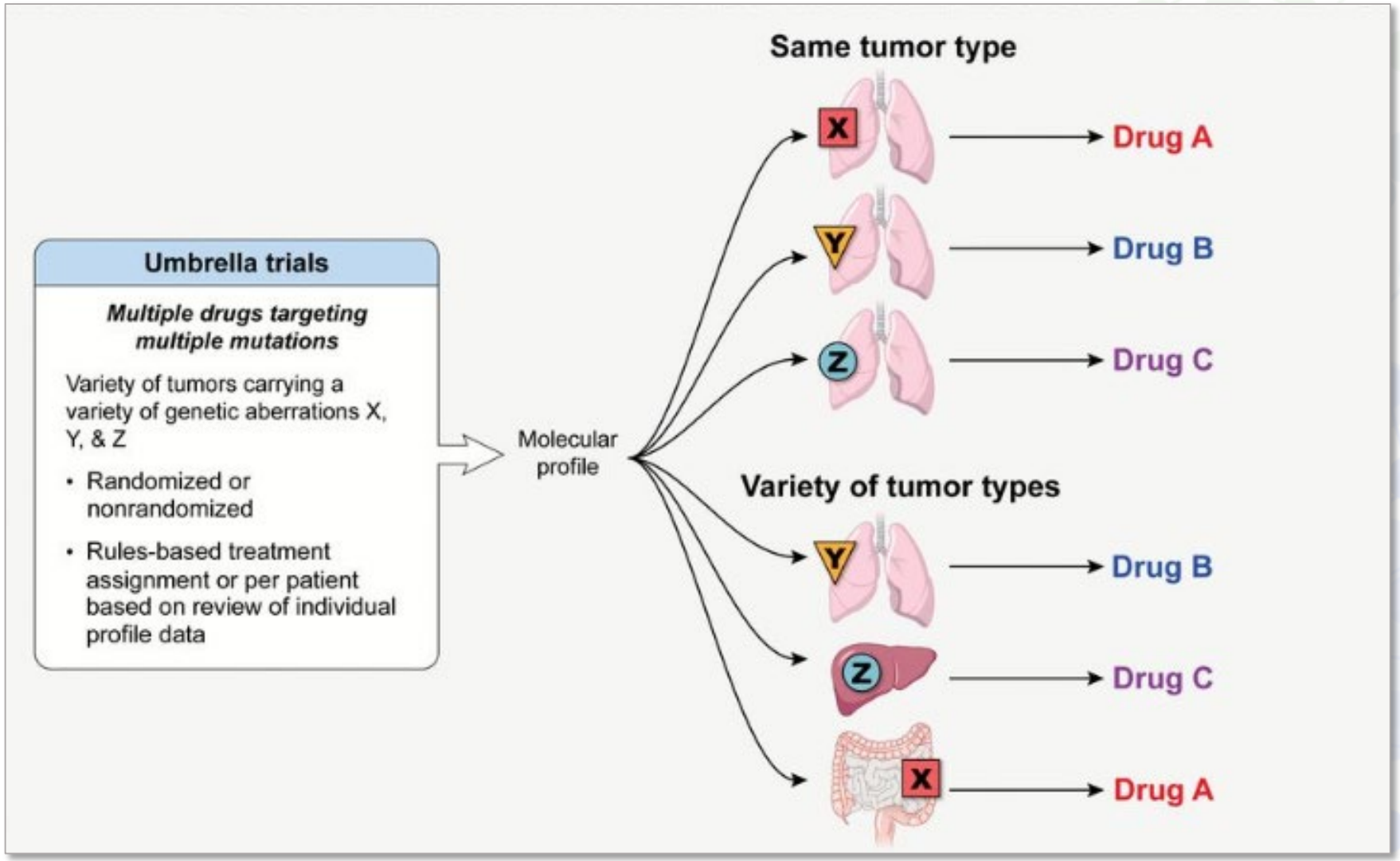
ORIGINAL ARTICLE

Effect of Aspirin on All-Cause Mortality in the Healthy Elderly

J.J. McNeil, M.R. Nelson, R.L. Woods, J.E. Lockery, R. Wolfe, C.M. Reid, B. Kirpach, R.C. Shah, D.G. Ives, E. Storey, J. Ryan, A.M. Tonkin, A.B. Newman, J.D. Williamson, K.L. Margolis, M.E. Ernst, W.P. Abhayaratna, N. Stocks, S.M. Fitzgerald, S.G. Orchard, R.E. Trevaks, L.J. Beilin, G.A. Donnan, P. Gibbs, C.I. Johnston, B. Radziszewska, R. Grimm, and A.M. Murray, for the ASPREE Investigator Group*



Precision Oncology Trial Designs



JNCI 107(4): djv003, 2015

CANCER MOONSHOT

IMPLEMENTATION

CMS Coverage Decision on Next-Gen Sequencing

MARCH 16, 2018

The Centers for Medicare & Medicaid Services (CMS) has determined that **Next Generation Sequencing (NGS) as a diagnostic laboratory test is reasonable and necessary and covered nationally**, when performed in a CLIA-certified laboratory, when ordered by a treating physician and…

Challenges & Opportunities Ahead

NIH NATIONAL CANCER INSTITUTE

Annual Plan & Budget Proposal

FOR FISCAL YEAR 2020

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.

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

Key Focus Areas

WORKFORCE DEVELOPMENT

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

BASIC SCIENCE

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

BIG DATA

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

CLINICAL TRIALS

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

Ongoing Recruitments

- CBIIT Director
- CGH Director
- CTEP Director
- Associate Director for Frederick

NATIONAL CANCER INSTITUTE

www.cancer.gov

www.cancer.gov/espanol