



Advancing the Fight Against Cancer: America's Medical Schools and Teaching Hospitals

For more than a century, the nation's medical schools and teaching hospitals have worked to understand, treat and fight cancer. Critically important research support from the National Institutes of Health (NIH), and especially the NIH's National Cancer Institute, over the past 60 years has helped to catalyze these and myriad other scientific endeavors at institutions across the country.

This united front has resulted in millions more Americans surviving cancer. For example:

- Cancer survival has doubled over the past 20 years – currently there are 9 to 10 million cancer survivors.
- Almost eight out of 10 women with breast cancer are alive 10 years after their diagnosis.
- Today, the overall survival rate for men with testicular cancer is 96 percent.
- The five-year survival rate for children with cancer is now more than 75 percent.
- Today, more people are living with cancer than dying from it. In 1976, just half of all cancer patients survived more than five years after their diagnosis. Today, nearly two-thirds (64 percent) are alive five years after they learn they have the disease.
- Deaths rates for the four most common cancers—breast, lung, prostate, and colorectal—have been dropping since 1990.

Listed on these pages are a few of the many examples of the advances in cancer knowledge and treatments achieved by medical schools and teaching hospitals. NIH funding support for these discoveries—where known by the AAMC—is indicated below the appropriate listing. To learn more about these and other advances, go to www.aamc.org/innovations.

2005

Discovered that women who have higher levels of an antibody to a protein called human mucin, or MUC1, are less likely to develop ovarian cancer. The findings may lead to a vaccine to prevent ovarian cancer.

Brigham and Women's Hospital, MA

Dartmouth Medical School, NH

University of Pittsburgh School of Medicine, PA

NIH funded

Developed first new breast cancer CT scanner to reach clinical testing in a generation. The new technology may have the ability to detect tumors much earlier than conventional mammography.

University of California, San Diego, School of Medicine

University of California, Davis, School of Medicine

NIH funded

2004

Discovered that a booster dose of a substance already found in the body appears to be a safe, non-toxic treatment for pancreatic cancer and shows signs of arresting pancreatic cancer cell growth in patients.

Pennsylvania State University College of Medicine, PA

NIH funded

Discovered mutations in a family of genes linked to more than a quarter of colon cancers as well as several other common cancers such as breast and lung cancer. This discovery revealed options for creating personalized therapies tailored for individual patients.

Johns Hopkins University School of Medicine, MD

NIH funded

2003

Discovered the first molecular therapy to target cancer-causing components and stop the infections process of the human papillomavirus (HPV). HPV is the major risk factor for developing cervical cancer.

Pennsylvania State University College of Medicine, PA

NIH funded

2000

Developed a polymer that enables medications to pass through cancer cell membranes and across the blood-brain barrier. This technology has great potential for improving treatment of a variety of cancers, especially those of the central nervous system.

University of Nebraska Medical Center, NE

NIH funded

1999

Discovered distinct genetic and cellular differences among B-cell chronic lymphocytic leukemia (CLL) patients that can predict clinical outcome. CLL is the most common U.S. adult leukemia. Doctors now know early whether to treat patients aggressively with chemotherapy.

North Shore-Long Island Jewish Health System, NY

NIH funded

1998

Identified for the first time an easily detectable protein that holds the key to more reliably warning women about early cell abnormalities in the cervix before cancer can develop.

University of California, Irvine, School of Medicine, CA

NIH funded

Pinpointed the site of the first gene for a major cancer located on the human X chromosome. The gene, for prostate cancer, may account for 20 percent of disease in families with a strong history of the cancer.

Fox Chase Cancer Center, PA

Johns Hopkins University School of Medicine, MD

Mayo Medical School, MN

NIH funded

Pioneered development of high-dose chemotherapy treatment for slow-growing cancers.

University of Maryland School of Medicine, MD

1997

Identified a tumor suppressor gene involved in a large percentage of brain, breast, and prostate cancers.

Columbia University College of Physicians and Surgeons, NY

1996

Isolated the gene for basal cell carcinoma, a form of skin cancer that affects about 750,000 Americans each year.

Stanford University School of Medicine, CA

NIH funded

Mapped the first specific prostate cancer gene to chromosome 1.

Johns Hopkins University School of Medicine, MD

NIH funded

1993

Identified a chemical in broccoli and other cruciferous vegetables that appears to inhibit the development of cancer.

Johns Hopkins University School of Medicine, MD

NIH funded

Identified a gene responsible for a widespread form of colon cancer.

Johns Hopkins University School of Medicine, MD

NIH funded

Discovered a genetic mutation that accounts for 60 percent of all cases of hereditary nonpolyposis colon cancer.

Dana-Farber Cancer Institute, MA

Harvard Medical School, MA

Johns Hopkins University School of Medicine, MD

NIH funded

1990

Unraveled the basic science behind the breast cancer drug Herceptin, which is effective in 20 to 30 percent of women with aggressive, early stage cases of breast cancer.

University of Pennsylvania School of Medicine, PA
NIH funded

Early use of gene therapy to treat recurring brain tumors.

University of Cincinnati College of Medicine, OH

1988

Discovered the relationship between a certain gene and an aggressive form of breast cancer. Led to the development of an antibody called Herceptin, which can help about 60,000 women a year and is the first approved treatment designed to attack cancer by attacking the defective protein made by a defective gene.

David Geffen School of Medicine at UCLA, CA
NIH funded

1985

Developed deoxycoformycin to cure hairy cell leukemia.

Ohio State University College of Medicine and Public Health, OH

1984

Created the "OncoMouse," a transgenic, highly cancer-prone mouse that offers important insights into human cancers.

Harvard Medical School, MA

1983

Performed nation's first autologous bone marrow transplant for acute myeloid leukemia.

Dartmouth Medical School, NH

1979

Identified human prostate-specific antigen and later developed the PSA blood test for prostate cancer.

Roswell Park Cancer Institute, NY

University at Buffalo State University of New York School of Medicine & Biomedical Sciences, NY

Identified the mechanism of action of Taxol, the first effective anti-cancer agent for use in the treatment of ovarian cancer.

Albert Einstein College of Medicine of Yeshiva University, NY

1977

Identified a cure for testicular cancer.

Indiana University School of Medicine, IN

1976

Discovered oncogenes, cancer-causing genes whose normal function has gone awry.

University of California, San Francisco, School of Medicine, CA
NIH funded

1970s

Pioneered limb-saving surgery for osteogenic sarcoma, a fast-growing cancer most common in children.

University of Florida College of Medicine, FL

1968

Developed first use of ultrasound to detect prostate cancer.

Wake Forest University Health Sciences (School of Medicine), NC

1957

Synthesized the anti-cancer drug fluorouracil.

University of Wisconsin Medical School, WI

1951

Showed link between smoking and lung cancer.

Wake Forest University School of Medicine, NC

University of Washington School of Medicine, WA

1950

Published initial convincing evidence of relationship between cancer and cigarette smoking.

University of Maryland School of Medicine, MD

1947

First successful leukemia remission.

Children's Hospital, MA

Harvard Medical School, MA

1942

First use of chemotherapy as a cancer treatment.

Yale-New Haven Hospital, CT

1940s

First bone marrow transplant performed.

University of Chicago Hospitals, IL

1929

First successful use of hormone therapy to treat prostate cancer.

University of Chicago Hospitals, IL

1920s

Invented the oxygen tent and developed the Whipple procedure, a standard surgical technique to treat cancer of the pancreas.

Columbia University College of Physicians and Surgeons, NY

1853

Initial use of the microscope in America for diagnosis of cancer.

University of Maryland School of Medicine, MD