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# Nobel Laureates and the American Cancer Society

**William G. Kaelin Jr, MD**

2019 Nobel Prize | Physiology or Medicine

For discovering the molecular “switch” that controls how cells respond to changing oxygen levels. Oxygen sensing is key to many diseases – for example, cancer cells hijack the oxygen process to increase their metabolism and fuel their growth. This discovery has had a significant impact on understanding cancer and has helped establish new treatment strategies.

**Gregg L. Semenza, MD, PhD**

2019 Nobel Prize | Physiology or Medicine

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**James E. Rothman, PhD**

2013 Nobel Prize | Physiology or Medicine

For defining the control of the movement of membranes in cells, which contributes greatly to the understanding of cell functioning in numerous diseases, including cancer. These internal cell membranes are key to the function of cells and the ability of cells to move, both of which are hallmarks of cancer cells.

**Bruce Beutler, PhD**

2011 Nobel Prize | Physiology or Medicine

Discovered receptor proteins that can recognize bacteria and other microorganisms as they enter the body, and activate innate immunity

**Ralph Steinman, PhD**

2011 Nobel Prize | Physiology or Medicine

Discovered a new cell type that he called the dendritic cell, which led to the first therapeutic vaccine for prostate cancer, Provenge

**Thomas A. Steitz, PhD**

2009 Nobel Prize | Chemistry

Studied the structure and function of the ribosome

**Jack W. Szostak, PhD**

2009 Nobel Prize | Physiology or Medicine

Helped discover how chromosomes are protected by telomeres and the enzyme telomerase

**Mario R. Capecchi, PhD**

2007 Nobel Prize | Physiology or Medicine

Using mouse embryonic stem cells, they developed techniques for manipulating individual genes. This allowed for a more precise understanding of how individual genes worked in the mouse and accelerated the use of the mouse as a model of human cancer. This work has led to the identification of genes that are targets of cancer therapies.

**Oliver Smithies, PhD**

2007 Nobel Prize | Physiology or Medicine

Using mouse embryonic stem cells, they developed techniques for manipulating individual genes. This allowed for a more precise understanding of how individual genes worked in the mouse and accelerated the use of the mouse as a model of human cancer. This work has led to the identification of genes that are targets of cancer therapies. Dr. Smithies was funded for earlier work on genetic control of protein

structure and synthesis.

**Roger D Kornberg, PhD**

2006 Nobel Prize | Chemistry

Studied the molecular basis of eukaryotic transcription

**Craig C. Mello, PhD**

2006 Nobel Prize | Physiology or Medicine

Helped discover RNA interference - gene silencing by double-stranded RNA

**Aaron Ciechanover, MD**

2004 Nobel Prize | Chemistry

Helped discover ubiquitin-mediated protein degradation

**Avram Hershko, MD, PhD**

2004 Nobel Prize | Chemistry

Helped discover ubiquitin-mediated protein degradation

**Irwin A. Rose, PhD**

2004 Nobel Prize | Chemistry

Helped discover ubiquitin-mediated protein degradation

**Leland Hartwell, PhD**

2001 Nobel Prize | Physiology or Medicine

Discovered key regulators of the cell cycle

**Günter Blobel, MD, PhD**

1999 Nobel Prize | Physiology or Medicine

Discovered how proteins find their proper location in the cell

**Edward B. Lewis, PhD**

1995 Nobel Prize | Physiology or Medicine

Found evidence that certain patterns in development apply to human cancers

**Alfred Gilman, MD, PhD**

1994 Nobel Prize | Physiology or Medicine

Helped to understand how cells talk to one another

**Phillip A. Sharp, PhD**

1993 Nobel Prize | Physiology or Medicine

Showed that readable regions on DNA are separated by some regions that cannot be read

**E. Donnall Thomas, MD**

1990 Nobel Prize | Physiology or Medicine

Pioneered bone marrow transplantation

**Sidney Altman, PhD**

1989 Nobel Prize | Chemistry

Discovered that RNA can sometimes act as an enzyme

**Thomas R. Cech, PhD**

1989 Nobel Prize | Chemistry

Found evidence that RNA may have enzymatic properties in cells

**J. Michael Bishop, MD**

1989 Nobel Prize | Physiology or Medicine

Discovered latent cancer genes, oncogenes, in normal cells

**Harold E. Varmus, MD**

1989 Nobel Prize | Physiology or Medicine

Showed that defects in normal genes can cause cancer

**Susumu Tonegawa, PhD**

1987 Nobel Prize | Physiology or Medicine

Discovered how antibodies are made by cells of the immune system

**Stanley Cohen, PhD**

1986 Nobel Prize | Physiology or Medicine

Showed that some growth factors influence cancer development

**Paul Berg, PhD**

1980 Nobel Prize | Chemistry

Was the first to create a recombinant DNA molecule

**Walter Gilbert, MD**

1980 Nobel Prize | Chemistry

Developed a method important for sequencing DNA

**Baruj Benacerraf, MD**

1980 Nobel Prize | Physiology or Medicine

Contributed to the understanding of the genetic basis of immunology

**Daniel Nathans, MD**

1978 Nobel Prize | Physiology or Medicine

Discovered enzymes that modify DNA, facilitating the study of genes

**Hamilton O. Smith, MD**

1978 Nobel Prize | Physiology or Medicine

Discovered DNA splicing enzymes important for genetic engineering

**Renato Dulbecco, MD**

1975 Nobel Prize | Physiology or Medicine

Found that certain animal cancer viruses can insert themselves into a cell's DNA

**Howard M. Temin, PhD**

1975 Nobel Prize | Physiology or Medicine

Discovered the reverse transcriptase that translates RNA into DNA

**David Baltimore, PhD**

1975 Nobel Prize | Physiology or Medicine

Found that some RNA viruses can transfer their information to DNA

**Christian B. Anfinsen, PhD**

1972 Nobel Prize | Chemistry

Discovered how enzymes assume their active shapes within the living cell

**Salvador E. Luria, MD**

1969 Nobel Prize | Physiology or Medicine

Did important work on phages to provide basic knowledge of viruses

**Max Delbruck, PhD**

1969 Nobel Prize | Physiology or Medicine

Showed how DNA replicates itself and the genetic structure of viruses

**Robert Holley, PhD**

1968 Nobel Prize | Physiology or Medicine

Determined the structure of transfer RNA, which is important in protein synthesis

**Marshall Nirenberg, PhD**

1968 Nobel Prize | Physiology or Medicine

Interpretation of the genetic code and its function in protein synthesis

**Charles B. Huggins, MD**

1966 Nobel Prize | Physiology or Medicine

Demonstrated hormonal dependence of breast and prostate cancer cells

**Francis P. Rous, MD**

1966 Nobel Prize | Physiology or Medicine

Discovered that cancer can be induced by injecting a tumor extract

**Robert Burns Woodward, PhD**

1965 Nobel Prize | Chemistry

Determined how the body uses small compounds to build organic molecules for life's functions

**James D. Watson, PhD**

1962 Nobel Prize | Physiology or Medicine

Discovered the double helix structure of DNA

**Severo Ochoa, MD**

1959 Nobel Prize | Physiology or Medicine

Discovered RNA polymerase, an enzyme that synthesizes RNA

**Edward L. Tatum, PhD**

1958 Nobel Prize | Physiology or Medicine

Reported that mutations can alter nutritional requirements of cells

**George W. Beadle, PhD**

1958 Nobel Prize | Physiology or Medicine

Provided evidence that for every enzyme there is one gene

**Vincent du Vigneaud, PhD**

1955 Nobel Prize | Chemistry

Isolated and synthesized two sulfurous pituitary hormones. The element sulfur plays an important role in the chemical processes that are the basis of all life.

**Fritz Lipmann, MD, PhD**

1953 Nobel Prize | Physiology or Medicine

Discovered an enzyme that helps to convert food into energy

**Hermann Joseph Muller, PhD**

1946 Nobel Prize | Physiology or Medicine

Discovered that x-ray irradiation can produce cell mutations

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