

Nobel Prize in Physiology or Medicine A tribute from the European Medical Association

The European Medical Association is proud to publish the complete list of the laureates of the Nobel Prize in Physiology or Medicine, from the first award in 1901 to the prize announced this year.

Behind every name on this list stands a discovery that changed how we understand the human body and how we care for patients. Insulin, penicillin, blood groups, the structure of DNA, organ transplantation, medical imaging, vaccines and immunotherapy are only some of the milestones that began in the laboratories and clinics of these scientists.

Many of these achievements took decades of patient, often uncertain work. Today they are part of everyday medical practice and save millions of lives every year, in every country, regardless of borders, language or wealth.

On behalf of its members, the European Medical Association wishes to express its deepest gratitude to these men and women for their contribution to the good of humanity. Their example reminds every physician and researcher that curiosity, rigour and dedication to the patient remain the foundations of medicine.

We hope this list will inspire our members, and especially young doctors and researchers, to continue along the path these laureates have opened.

Dr. Vincenzo Costigliola
President, European Medical Association

The Nobel Prize in Physiology or Medicine has been awarded 117 times to 235 laureates from 1901 to 2026 (116 prizes and 232 laureates up to 2025, plus the three 2026 laureates announced on 5 October 2026).

The prize was not awarded in nine years: 1915, 1916, 1917, 1918, 1921, 1925, 1940, 1941 and 1942. Motivations below are short summaries of the official citations; see [NobelPrize.org](https://www.nobelprize.org) for the full wording.

Nobel Laureates This Year

The European Medical Association dedicates this publication in particular to the 2026 laureates, Karl Deisseroth, Peter Hegemann and Georg Nagel, honoured "for their discoveries concerning light-gated ion channels and optogenetics". Their work has given medicine a way to switch specific nerve cells on and off with light, and to see which cells drive which functions.

The laureates

Laureate	Born	Affiliation
Karl Deisseroth	1971, United States	Stanford University and Howard Hughes Medical Institute, USA
Peter Hegemann	1954, Germany	Humboldt University of Berlin, Germany
Georg Nagel	1953, Germany	University of Würzburg, Germany

What they discovered

The story began with a simple question of basic biology: how does *Chlamydomonas*, a single-celled green alga, swim towards light? In the early 2000s, working at institutes of the Max Planck Society in Germany, Peter Hegemann and Georg Nagel found the answer in channelrhodopsin, a light-sensitive protein on the cell surface.

By expressing the algal genes in frog eggs, Nagel, Hegemann and colleagues showed that channelrhodopsin is itself an ion channel that opens when struck by light. Channelrhodopsin-2, activated by blue light, lets positive ions flow into the cell within milliseconds.

In 2005, at Stanford University, Karl Deisseroth and his colleagues took the decisive step. They introduced the channelrhodopsin-2 gene into rat nerve cells and showed that short pulses of blue light could trigger nerve impulses with millisecond precision. The method was named optogenetics a year later.

Why they were recognised

Before optogenetics, scientists could stimulate the brain only crudely, activating many different cells at once. Optogenetics allows researchers to target genetically defined populations of neurons and control them precisely in living animals.

The Nobel Assembly noted that the technique has rapidly gained global impact. Laboratories worldwide now use it to identify the neural circuits behind specific memories, emotions and behaviours, including those involved in neurological and psychiatric disorders such as depression, anxiety, addiction and Parkinson's disease. In the words of Per Svenningsson, chair of the Nobel Committee, optogenetics allows the brain to be mapped in ways once only dreamed of.

The discovery is now moving from the laboratory towards the patient. Light-sensitive proteins derived from this work are being tested to restore partial vision in people blinded by inherited retinal degeneration.

A lesson for medicine

This prize shows how research driven by pure curiosity, here the behaviour of a microscopic alga, can open a new chapter in medicine. It also reflects what the European Medical Association values most: collaboration across countries and disciplines, from plant physiology and biophysics to psychiatry and neuroscience.

To Karl Deisseroth, Peter Hegemann and Georg Nagel go our warmest congratulations and our gratitude for a discovery that will benefit patients for generations to come.

LIST OF NOBEL LAUREATES OVER THE YEARS 1901 - 2026

1901–1925

Year	Laureate(s)	Awarded for
1901	Emil von Behring	Serum therapy, especially against diphtheria
1902	Ronald Ross	Work on malaria and how it enters the organism
1903	Niels Ryberg Finsen	Treatment of diseases (lupus vulgaris) with concentrated light
1904	Ivan Pavlov	Physiology of digestion
1905	Robert Koch	Investigations and discoveries on tuberculosis
1906	Camillo Golgi; Santiago Ramón y Cajal	Structure of the nervous system
1907	Alphonse Laveran	Role of protozoa in causing disease
1908	Ilya Mechnikov; Paul Ehrlich	Work on immunity
1909	Theodor Kocher	Physiology, pathology and surgery of the thyroid gland
1910	Albrecht Kossel	Cell chemistry, proteins and nucleic substances
1911	Allvar Gullstrand	Dioptrics of the eye
1912	Alexis Carrel	Vascular suture and transplantation of blood vessels and organs
1913	Charles Richet	Anaphylaxis
1914	Robert Bárány	Physiology and pathology of the vestibular apparatus
1915–1918	Not awarded	—
1919	Jules Bordet	Discoveries relating to immunity

Year	Laureate(s)	Awarded for
1920	August Krogh	Capillary motor regulating mechanism
1921	Not awarded	—
1922	Archibald V. Hill; Otto Meyerhof	Heat production in muscle (Hill); oxygen consumption and lactic acid metabolism in muscle (Meyerhof)
1923	Frederick G. Banting; John J. R. Macleod	Discovery of insulin
1924	Willem Einthoven	Mechanism of the electrocardiogram
1925	Not awarded	—

1926–1950

Year	Laureate(s)	Awarded for
1926	Johannes Fibiger	Spiroptera carcinoma
1927	Julius Wagner-Jauregg	Malaria inoculation in the treatment of dementia paralytica
1928	Charles Nicolle	Work on typhus
1929	Christiaan Eijkman; Frederick Gowland Hopkins	Antineuritic vitamin (Eijkman); growth-stimulating vitamins (Hopkins)
1930	Karl Landsteiner	Discovery of human blood groups
1931	Otto Warburg	Nature and mode of action of the respiratory enzyme
1932	Charles Sherrington; Edgar Adrian	Functions of neurons
1933	Thomas Hunt Morgan	Role of chromosomes in heredity
1934	George H. Whipple; George R. Minot; William P. Murphy	Liver therapy for anaemia

Year	Laureate(s)	Awarded for
1935	Hans Spemann	Organizer effect in embryonic development
1936	Henry Dale; Otto Loewi	Chemical transmission of nerve impulses
1937	Albert Szent-Györgyi	Biological combustion, vitamin C and fumaric acid catalysis
1938	Corneille Heymans	Role of sinus and aortic mechanisms in regulating respiration
1939	Gerhard Domagk	Antibacterial effects of Prontosil
1940–1942	Not awarded	—
1943	Henrik Dam; Edward A. Doisy	Discovery of vitamin K (Dam); its chemical nature (Doisy)
1944	Joseph Erlanger; Herbert S. Gasser	Differentiated functions of single nerve fibres
1945	Alexander Fleming; Ernst B. Chain; Howard Florey	Penicillin and its curative effect in infectious diseases
1946	Hermann J. Muller	Production of mutations by X-ray irradiation
1947	Carl Cori; Gerty Cori; Bernardo Houssay	Catalytic conversion of glycogen (Coris); anterior pituitary hormone in sugar metabolism (Houssay)
1948	Paul Müller	Efficiency of DDT as a contact poison against arthropods
1949	Walter Hess; Egas Moniz	Functional organization of the interbrain (Hess); therapeutic value of leucotomy in certain psychoses (Moniz)
1950	Edward C. Kendall; Tadeus Reichstein; Philip S. Hench	Hormones of the adrenal cortex, their structure and effects

1951–1975

Year	Laureate(s)	Awarded for
1951	Max Theiler	Yellow fever and how to combat it
1952	Selman A. Waksman	Discovery of streptomycin, the first antibiotic effective against tuberculosis
1953	Hans Krebs; Fritz Lipmann	Citric acid cycle (Krebs); coenzyme A (Lipmann)
1954	John F. Enders; Thomas H. Weller; Frederick C. Robbins	Growth of poliomyelitis virus in tissue cultures
1955	Hugo Theorell	Nature and mode of action of oxidation enzymes
1956	André F. Cournand; Werner Forssmann; Dickinson W. Richards	Heart catheterization and pathological changes in the circulatory system
1957	Daniel Bovet	Synthetic compounds inhibiting body substances (curare-like agents, antihistamines)
1958	George Beadle; Edward Tatum; Joshua Lederberg	Genes regulate chemical events (Beadle, Tatum); genetic recombination in bacteria (Lederberg)
1959	Severo Ochoa; Arthur Kornberg	Biological synthesis of RNA and DNA
1960	Frank Macfarlane Burnet; Peter Medawar	Acquired immunological tolerance
1961	Georg von Békésy	Physical mechanism of stimulation within the cochlea
1962	Francis Crick; James Watson; Maurice Wilkins	Molecular structure of nucleic acids (DNA)
1963	John Eccles; Alan Hodgkin; Andrew Huxley	Ionic mechanisms of the nerve cell membrane
1964	Konrad Bloch; Feodor Lynen	Regulation of cholesterol and fatty acid metabolism

Year	Laureate(s)	Awarded for
1965	François Jacob; André Lwoff; Jacques Monod	Genetic control of enzyme and virus synthesis
1966	Peyton Rous; Charles B. Huggins	Tumour-inducing viruses (Rous); hormonal treatment of prostatic cancer (Huggins)
1967	Ragnar Granit; Haldan Keffer Hartline; George Wald	Primary physiological and chemical visual processes in the eye
1968	Robert W. Holley; Har Gobind Khorana; Marshall W. Nirenberg	Interpretation of the genetic code and its role in protein synthesis
1969	Max Delbrück; Alfred D. Hershey; Salvador E. Luria	Replication mechanism and genetic structure of viruses
1970	Bernard Katz; Ulf von Euler; Julius Axelrod	Humoral transmitters in nerve terminals
1971	Earl W. Sutherland Jr.	Mechanisms of action of hormones
1972	Gerald M. Edelman; Rodney R. Porter	Chemical structure of antibodies
1973	Karl von Frisch; Konrad Lorenz; Nikolaas Tinbergen	Organization of individual and social behaviour patterns
1974	Albert Claude; Christian de Duve; George E. Palade	Structural and functional organization of the cell
1975	David Baltimore; Renato Dulbecco; Howard M. Temin	Interaction between tumour viruses and the genetic material of the cell

1976–2000

Year	Laureate(s)	Awarded for
1976	Baruch S. Blumberg; D. Carleton Gajdusek	New mechanisms for the origin and spread of infectious diseases

Year	Laureate(s)	Awarded for
1977	Roger Guillemin; Andrew V. Schally; Rosalyn Yalow	Peptide hormone production of the brain (Guillemin, Schally); radioimmunoassays (Yalow)
1978	Werner Arber; Daniel Nathans; Hamilton O. Smith	Restriction enzymes and their application to molecular genetics
1979	Allan M. Cormack; Godfrey N. Hounsfield	Computer-assisted tomography (CT)
1980	Baruj Benacerraf; Jean Dausset; George D. Snell	Genetically determined cell surface structures regulating immune reactions
1981	Roger W. Sperry; David H. Hubel; Torsten N. Wiesel	Specialization of the cerebral hemispheres (Sperry); information processing in the visual system (Hubel, Wiesel)
1982	Sune K. Bergström; Bengt I. Samuelsson; John R. Vane	Prostaglandins and related substances
1983	Barbara McClintock	Mobile genetic elements
1984	Niels K. Jerne; Georges J. F. Köhler; César Milstein	Theories on the immune system; principle for producing monoclonal antibodies
1985	Michael S. Brown; Joseph L. Goldstein	Regulation of cholesterol metabolism
1986	Stanley Cohen; Rita Levi-Montalcini	Discovery of growth factors
1987	Susumu Tonegawa	Genetic principle for generating antibody diversity
1988	James W. Black; Gertrude B. Elion; George H. Hitchings	Important principles for drug treatment
1989	J. Michael Bishop; Harold E. Varmus	Cellular origin of retroviral oncogenes
1990	Joseph E. Murray; E. Donnall Thomas	Organ and cell transplantation in treating human disease

Year	Laureate(s)	Awarded for
1991	Erwin Neher; Bert Sakmann	Function of single ion channels in cells
1992	Edmond H. Fischer; Edwin G. Krebs	Reversible protein phosphorylation as a regulatory mechanism
1993	Richard J. Roberts; Phillip A. Sharp	Split genes
1994	Alfred G. Gilman; Martin Rodbell	G-proteins and their role in signal transduction
1995	Edward B. Lewis; Christiane Nüsslein-Volhard; Eric F. Wieschaus	Genetic control of early embryonic development
1996	Peter C. Doherty; Rolf M. Zinkernagel	Specificity of cell-mediated immune defence
1997	Stanley B. Prusiner	Prions, a new biological principle of infection
1998	Robert F. Furchgott; Louis J. Ignarro; Ferid Murad	Nitric oxide as a signalling molecule in the cardiovascular system
1999	Günter Blobel	Intrinsic signals governing protein transport and localization in the cell
2000	Arvid Carlsson; Paul Greengard; Eric R. Kandel	Signal transduction in the nervous system

2001–2026

Year	Laureate(s)	Awarded for
2001	Leland H. Hartwell; Tim Hunt; Paul Nurse	Key regulators of the cell cycle
2002	Sydney Brenner; H. Robert Horvitz; John E. Sulston	Genetic regulation of organ development and programmed cell death
2003	Paul C. Lauterbur; Peter Mansfield	Magnetic resonance imaging (MRI)

Year	Laureate(s)	Awarded for
2004	Richard Axel; Linda B. Buck	Odorant receptors and the organization of the olfactory system
2005	Barry J. Marshall; J. Robin Warren	Helicobacter pylori and its role in gastritis and peptic ulcer disease
2006	Andrew Z. Fire; Craig C. Mello	RNA interference – gene silencing by double-stranded RNA
2007	Mario R. Capecchi; Martin J. Evans; Oliver Smithies	Specific gene modifications in mice using embryonic stem cells
2008	Harald zur Hausen; Françoise Barré-Sinoussi; Luc Montagnier	Human papilloma viruses causing cervical cancer (zur Hausen); human immunodeficiency virus, HIV (Barré-Sinoussi, Montagnier)
2009	Elizabeth H. Blackburn; Carol W. Greider; Jack W. Szostak	Protection of chromosomes by telomeres and the enzyme telomerase
2010	Robert G. Edwards	Development of in vitro fertilization
2011	Bruce A. Beutler; Jules A. Hoffmann; Ralph M. Steinman	Activation of innate immunity (Beutler, Hoffmann); the dendritic cell and its role in adaptive immunity (Steinman)
2012	John B. Gurdon; Shinya Yamanaka	Reprogramming mature cells to become pluripotent
2013	James E. Rothman; Randy W. Schekman; Thomas C. Südhof	Machinery regulating vesicle traffic in cells
2014	John O'Keefe; May-Britt Moser; Edvard I. Moser	Cells constituting a positioning system in the brain
2015	William C. Campbell; Satoshi Ōmura; Tu Youyou	Therapy against roundworm parasite infections (Campbell, Ōmura); therapy against malaria (Tu)

Year	Laureate(s)	Awarded for
2016	Yoshinori Ohsumi	Mechanisms of autophagy
2017	Jeffrey C. Hall; Michael Rosbash; Michael W. Young	Molecular mechanisms controlling the circadian rhythm
2018	James P. Allison; Tasuku Honjo	Cancer therapy by inhibition of negative immune regulation
2019	William G. Kaelin Jr.; Peter J. Ratcliffe; Gregg L. Semenza	How cells sense and adapt to oxygen availability
2020	Harvey J. Alter; Michael Houghton; Charles M. Rice	Discovery of hepatitis C virus
2021	David Julius; Ardem Patapoutian	Receptors for temperature and touch
2022	Svante Pääbo	Genomes of extinct hominins and human evolution
2023	Katalin Karikó; Drew Weissman	Nucleoside base modifications enabling effective mRNA vaccines against COVID-19
2024	Victor Ambros; Gary Ruvkun	microRNA and its role in post-transcriptional gene regulation
2025	Mary E. Brunkow; Fred Ramsdell; Shimon Sakaguchi	Peripheral immune tolerance
2026	Karl Deisseroth; Peter Hegemann; Georg Nagel	Light-gated ion channels and optogenetics

Sources

- All Nobel Prizes in Physiology or Medicine – NobelPrize.org
- 2026 laureates – University of Gothenburg
- 2026 Nobel medicine prize: discoveries and laureates – Daily News Egypt (Reuters/Nobel Assembly)
- 2026 Nobel medicine prize honors Deisseroth, Hegemann and Nagel – AllSci