

Timeline Of Genetics Discoveries

Year of discovery	Personality/Personalities	Discovery
1865	Johan Gregor Mendel	Laws of inheritance (Mendel's experiments, Laws of inheritance)
1869	Paul Langerhans	Discovered and described the islets of Langerhans in the pancreas (Diabetes mellitus)
1869	Friedrich Miescher	He isolated DNA for the first time ; isolated it in small quantities from white blood cells; not further analyzed (DNA)
1879	Walther Flemming	Chromosomes in mitosis (Chromosome, Mitosis)
1892	Dmitri Ivanowski (Дмитрий Иванович)	The term virus (Viruses)
1908	Godfrey Harold Hardy a Wilhelm Weinberg	Basic law of population genetics (Hardy-Weinberg equation)
1909	Karl Landsteiner	Blood group system AB0 – classification of people into blood groups A, B, AB, 0; 1930 Nobel Prize (Heredity of blood group systems)
1909	Thomas Hunt Morgan	Linear arrangement of genes on chromosomes, linkage of genes, phase coupling and repulsion; 1933 Nobel Prize (Genetic linkage)
1910	Albert Kossel	Cytology - research on proteins and nucleic acids; 1910 Nobel Prize (Nucleic acid, proteins)
1911	Peyton Rous	Discovery of a virus with oncogenic potential - domestic chicken sarcomas; 1966 Nobel Prize (Viruses, Oncovirus)
1920	Frederick Banting a John J. R. Macleod	Isolation of an active substance from the pancreas for the treatment of diabetes; 1923 Nobel Prize (Multifactorial Inheritance, Autoimmune Diseases, Genetic Engineering)
since 1930	George D. Snell	Discovery of genetic factors that determine the possibility of tissue transplantation, the histocompatibility complex (H-2) of the mouse; 1980 Nobel Prize (Major histocompatibility complex, Transplantation)
since 1931	William Bateson, Reginald Crundall Punnett	Linkage of genes, crossing-over, recombination; (Genetic linkage)
1937-45	George Wells Beadle, Edward Lawrie Tatum	Biochemical and genetic studies on the <i>Neurospora</i> microorganism – determining the ability of genes to regulate certain chemical reactions; 1958 Nobel Prize (Cell signalling)
1944	Oswald Avery, Colin MacLeod, Maclyn McCarty	Basic genetic information is stored in DNA (Prokaryote, Transformation)
1940-50	Barbara McClintock	The genetic map of maize, the role of centromeres and telomeres and the subsequent discovery of genetic transposition – mobile DNA sequences (transpososomes); 1983 Nobel Prize (Transposomes, Centromere, Telomere)
1940-60	Peter Brian Medawar, Frank (Macfarlane) Burnet	Transplantation – discovery of acquired immunological tolerance; 1960 Nobel Prize (Transplantation, Immunological tolerance and possibilities of its induction)
1950 and 1970-80	Edward B. Lewis; Christiane Nusslein-Volhard a Eric F. Wieschaus	Developmental Genetics; first <i>Drosophila melanogaster</i> – discovery of the principle of co-linearity (localization of sets of genes on chromosomes is related to the arrangement of body segments). Furthermore, this principle is confirmed for all multicellular animals; 1995 Nobel Prize (Embryonic development, <i>Drosophila melanogaster</i>)
1950-61	Francois Jacob, André Lwoff, Jacques Monod	Control and regulation of the expression of enzymes of metabolic pathways by feedback with the DNA sequence (e.g. <i>E. coli</i> /lactose); 1965 Nobel Prize (Unicellular models, Prokaryote)
1950-59	Stanley Cohen, Rita Levi-Montalcini	Isolation of nerve growth factor (NGF), which led to the discovery of epidermal growth factor; 1986 Nobel Prize (Cell signalling, Proto-oncogenes, oncogenes)
1953	James D. Watson, Francis H. C. Crick, Maurice H. Frederics	Determination of DNA structure; 1962 Nobel Prize (DNA)
1956	Joe Hin Tjio a Albert Levan	Determining the exact number of chromosomes in human somatic cells (karyotype)
1956	Robert W. Holley, Har. G. Khorana, Marshall W. Nirenberg	Role of RNA in protein synthesis, genetic code and its role in protein biosynthesis; 1968 Nobel Prize (mRNA, Translation)
1957	Arthur Kornberg	While studying the bacterium <i>Escherichia coli</i> , he discovered DNA polymerase (DNA); Severo Ochoa and Arthur Kornberg for the discovery of the mechanism of RNA and DNA biosynthesis 1959 Nobel Prize
1958	Tuneko Okazaki, Reiji Okazaki	Semiconservative process of replication, Okazaki fragments (DNA)
1958-69	Earl W. Sutherland, Jr.	Isolation of the hitherto unknown cyclic adenosine monophosphate (cAMP), clarification of its role in the metabolism of some hormones; 1971 Nobel Prize (Cell signalling)
1959	Jérôme JL Marie Lejeune	Chromosomal basis of Down syndrome - trisomy of chromosome 21 (Down Syndrome)
		Discovery of the HLA complex and characterization of the genes of the major

1960-65	Baruj Benacerraf, Jean Dausset	histocompatibility complex (HHC) of humans and subsequently other vertebrates; 1980 Nobel Prize (Major Histocompatibility Complex,)
since 1960	Alfred Goodman Gilman, Martin Rodbell	Discovery of G-proteins and elucidation of their role in cell signaling; 1994 Nobel Prize (Cell signalling)
since 1961	Leonard Hayflick a P. Moorhead	They described a limitation in the number of cell cycles in fibroblasts cultured <i>in vitro</i> - the so-called replicative aging (senescence) (Replicative aging)
1962	Werner Aber, Daniel Nathans, Hamilton O. Smith	Discovery of restriction endonucleases; 1978 Nobel Prize (Restriction fragment length polymorphism)
1970	David Baltimore, Renato Dulbecco, Howard M. Temin	Oncovirology – interaction of retroviruses with the genetic material of the cell, reverse transcription; 1975 Nobel Prize (Oncogenetic viruses, Viral carcinogenesis)
1970-71	Leland Harrison Hartwell, Richard Timothy Hunt, Paul Maxime Nurse	While studying the cell cycle of yeast (<i>Saccharomyces cerevisiae</i>), genes regulating the cell cycle were discovered; discovery of homologous genes in humans (cyclins and cyclin-dependent protein kinases) (The Cell Cycle, Proto-oncogenes, oncogenes)
1970-80	Susumu Tonegawa	DNA analysis of B cells (experiments on mice), discovery of the genetic principle of antibody diversity; 1987 Nobel Prize (Genetic control of antibody production)
1970-80	John M. Bishop, Harold E. Varmus	Study of the relationship of retroviruses to the development of malignant tumors, discovery of the first human oncogene <i>c-src</i> ; 1989 Nobel Prize (Oncovirus, Proto-oncogenes, oncogenes)
1975	Edwin Mellor Southern	He developed a DNA hybridization method in gel electrophoresis to identify a specific DNA sequence (DNA hybridizace, Southern blotting)
1975	John Foxton Ross Kerr	He first described apoptosis – the genetically programmed death of cells; The 2002 Nobel Prize - Sydney Brenner, H. Robert Horvitz, John E. Sulston - was awarded for the discoveries of genetic regulation of organ development and apoptosis (Embryonic development, Aging of the organism)
1975-77	Frederick Sanger, Walter Gilbert, Paul Berg	They developed DNA sequencing techniques; 1980 Nobel Prize (DNA ; Sequencing); Frederick Sanger already won one Nobel Prize in 1958 for determining the polypeptide chain of insulin (Genetics of "civilization" diseases)
1976	Harald zur Hausen	Discovery of the papillomavirus, which is the cause of cervical cancer; Nobel Prize 2008 (Viral carcinogenesis)
1977	Richard John Roberts, Phillip Allen Sharp	They independently discovered the division of genes of eukaryotic cells into sections (introns and exons) and the cutting of introns from mRNA (gene-splicing); 1993 Nobel Prize (Gene structure, Post-transcriptional Modifications)
1982	Stanley B. Prusiner	He formulated a theory about a new causative agent of infectious diseases of the nervous system; discovery of prions; 1997 Nobel Prize (Prions)
1983	Francoise Barré-Sinoussi, Luc Montagnier	Discovery of HIV (Human Immunodeficiency Virus); Nobel Prize 2008 (Imunodeficiency, AIDS)
1984	Elizabeth Blackburn, Carol Whidney Greider, Jack William Szostak	Discovery of telomeres (protection of the ends of linear chromosomes) and the enzyme telomerase; Nobel Prize 2009 (Telomeres and telomerase)
1985	Kary Banks Mullis with colleagues	He developed the PCR (Polymerase Chain Reaction) method, which makes it possible to multiply a selected section of hereditary information from a single DNA molecule; Nobel Prize 1993 (DNA, Polymerase Chain Reaction)
1988-2001	Project HUGO	Human Genome Sequencing; The international consortium Human Genome Project and the American private company Celera Genomics - "rough" reading of the genome (DNA, Genetic mapping)
1989	Mario Renato Capecchi, Martin Evans, Oliver Smithies	Study of embryonic development – mouse embryonic stem cells, knockout mice; Nobel Prize 2007 - (Stem cells, Knockout mouse, Mus musculus)
1990	Stephen F. Altshul, Gish W., David J. Lipmann, Miller W., Eugene Wilson Meyers	They created the BLAST (Basic Local Alignment Search Tool) algorithm for calculating sequence similarity and then searching for genes and proteins based on mutual homology (in silico – computer models)
1990	William French Anderson	The first performed gene therapy on a 4-year-old child suffering from immunodeficiency (SCID – Severe Combined Immunodeficiency); the treatment result was partial. 2001 Alan Fisher cured SCID (Imunodeficiency)
1996	Dolly the sheep	First cloning of a mammal from a single body cell (Stem cells)
1998	Andrew Z. Fire, Craig C. Mello	Discovery of RNA interference – a system of controlling the activity of some (specific) genes; Nobel Prize 2006 (Transcription, RNA interference)

Prominent figures in the history of genetics



Johann Gregor Mendel (1822–1884)



Walther Flemming (1843–1905)



Karl Landsteiner (1868–1943)



Thomas Hunt Morgan (1866–1945)



Oswald Theodore Avery (1877–1955)



Barbara McClintock (1902–1992)



Francis Harry Compton Crick (1916–2004)



James Dewey Watson (1928)

Related articles

- Mendel's experiments
- Laws of Inheritance
- Hardy-Weinberg equilibrium

External links

- History of genetics (<http://www.esp.org/books/sturt/history/readbook.html>)

Sources

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