

## Notable and Anniversary Dates in Biochemistry for 2003

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- 200th anniversary of the law of gas solubility (J. Dalton, 1803).
- 200th anniversary of *Essai de statistique chimique* (C. L. Berthollet, 1803).
- 200th anniversary of *Lectures on the Elements of Chemistry* (J. Black, 1803).
- 150th anniversary of the discovery of acetylsalicylic acid (Ch. Gerhardt, 1853).
- 125th anniversary of the description of the chemical structure of quinine (A. M. Butlerov, A. I. Vyshnegradsky, 1878–1880).
- 125th anniversary of the discovery of the involvement of blood plates in blood coagulation (G. Hayem, 1878).
- 125th anniversary of the discovery and description of caryokinesis (an indirect division of the nucleus) (P. I. Peremzhko, 1878; W. Flemming, 1878–1880).
- 100th anniversary of the discovery of chromatography (sorptional dynamic separation of substance mixtures) (M. S. Tsvet, 1903).
- 100th anniversary of the first experimentally based formulation of the chromosome theory of heredity (W. Sutton, T. Boveri, 1903).
- 75th anniversary of the discovery of phytoncides (B. P. Tokin, 1928).
- 75th anniversary of the antibiotic ability of penicillin (A. Fleming, 1928).
- 75th anniversary of the isolation of vitamin C from adrenals and establishment of its chemical structure (A. Szent-Gyorgyi, 1928).
- 50th anniversary of the discovery of the structural and functional nature of DNA molecule as the carrier of genetic information (G. Watson, F. Crick, 1953).
- 50th anniversary of deciphering the amino acid sequence of the insulin molecule (F. Sanger, 1953).
- 50th anniversary of the first chemical synthesis of peptide hormones oxytocin and vasopressin (V. du Vigneaud, 1953).
- 50th anniversary of the Institute of Research for New Antibiotics (Moscow, 1953).

January 7 – 125th anniversary of the death of F. Raspail (1794–1878), French chemist and physician. He was the first who used chemical analysis in cytology (1825), proposed (1833) special histochemical techniques (ashing, microincineration, etc.), founded histochemistry as a branch of science. Bibliography: *Nouveau Systême de Chimie Organique* (1833, Paris). Literature: see Great Soviet Encyclopedia, Third Edition; Great Medical Encyclopedia, Third Edition, Vol. 6, p. 79; F. A. Brokhaus and I. A. Efron (1899) *Encyclopedic Dictionary*, St. Petersburg.

January 7 – 100th anniversary of the birth of David Lazarevich Ferdman (1903–1970, born in the town of Terespol, now Lyublin Voevodstvo, Poland), Ukrainian biochemist, Corresponding Member of the USSR Academy of Sciences and of the Ukrainian SSR Academy of Sciences. In 1943 he organized the Section of Muscle Biochemistry in the Institute of Biochemistry, Ukrainian SSR Academy of Sciences, and was its leader up to 1970. Concurrently he was Professor at the Department of Biochemistry, Kiev University. His main works are in the field of substance metabolism in muscle in norm and disease. In 1929 he found in muscle tissue the binding of inorganic phosphoric acid with production of glucose phosphate, i.e., he detected for the first time phosphorylation of glycogen in muscles; established the role of phosphoric acid at different steps of the carbohydrate metabolism and studied degradation and resynthesis of energy-rich phosphates in skeletal and cardiac muscles; was the first to detect glutamine in muscles, to study its metabolism in norm and in muscle diseases, and to determine its role. He proposed to use ATP for treatment of muscle diseases, in particular, of muscular dystrophies, and elaborated the method for its preparation. He is the author of a guidebook for biochemistry which has appeared in many editions. Bibliography and literature: see Great Medical Encyclopedia, Third Edition.

March 17 – the 150th anniversary of the birth of H. Meyer (1853–1939), Austrian pharmacologist. He detected in urine glucuronic acid and showed its detoxifying effect (1879); developed a lipid theory of anesthesia based on the interrelation between the effect of analgesics

and their solubility in lipids (1899); showed that tetanus toxin penetrated into the central nervous system not with blood but by diffusion along axial cylinders of peripheral nerves; studied effects on the body of alkaloids, paraffin, tetanic anatoxin, purgatives, and diuretics, and also of intoxication caused by white phosphorus; showed calcium ions to decrease the permeability of blood and lymphatic vessels (1911). His works in organotherapy (1927) are known. Bibliography and literature: see Great Medical Encyclopedia, Third Edition.

March 24 – 100th anniversary of the birth of A. Butenandt (1903–1995), German biochemist. He contributed to studies on chemistry of steroid sex hormones, found the female sex hormone estrogen (1929); isolated androsterone from human urine (1931) and studied its chemical structure, synthesized the male sex hormone testosterone, prepared a pure progesterone (1934, with colleagues). Won the 1939 Nobel Prize in Chemistry (jointly with L. Ruzicka) for studies in chemistry of steroid sex hormones. In 1961 he isolated from bombyx the sex hormone pheromone (bombicol), established its chemical structure, and synthesized it. Bibliography and literature: *The Nobel Prize Winners*, in *The Encyclopedia: A-L* (1992) Progress, Moscow; *J. Chem. Education* (1949) February; Great Medical Encyclopedia, Third Edition; Great Soviet Encyclopedia, Third Edition.

March 26 – 100th anniversary of the birth of Alexandra Alexeevna Prokof'eva-Belgovskaya (1903–1984, born in the town of Alexandrov), Russian cytogeneticist, Corresponding Member of the USSR Academy of Medical Sciences. From 1969 she was the leader of the Laboratory of Cytogenetics, Institute of Molecular Biology, USSR Academy of Sciences. Her works are mainly in the field of the structure and functions of chromosomes. She determined for the first time the gene size in the polytene chromosomes of *Drosophila* (1935); formulated a concept about the nature of heterochromatin and the control of the gene activity via heterochromatization; described the chronology of reproduction of human chromosomes, established the asynchronicity of this process in homological chromosome; showed the difference of chromosomes in various cells. Bibliography and literature: see Great Medical Encyclopedia, Third Edition.

April 6 – 75th anniversary of the birth of J. Watson (born 1928), American biochemist, a specialist in molecular biology, member of the American National Academy of Sciences (1962). He created a three-dimensional model of the DNA molecule and studied its chemical structure (together with F. Crick) that explained how the genetic information was written in DNA molecules and provided the basis for hypothesis on the mechanism of its self-replication. In 1962 he won the Nobel Prize in Physiology and Medicine (jointly with F. Crick and M. Wilkins) for discoveries in the field of molecular structure of nucleic acids and determination of their role in the

transmission of information in living matter. Bibliography: *The Double Helix* (1968); *Molecular Biology of the Cell* (1983). Literature: *The Nobel Prize Winners*, in *The Encyclopedia: M-Ya* (1992) Progress, Moscow; *New York Times* (1984) December; Great Medical Encyclopedia, Third Edition.

May 12 – 200th anniversary of the birth of J. Liebig (1803–1873), German chemist, Professor. Works in the field of human nutrition contain a classification of nutritional substances, emphasize the significance of methods of food preparation, and propose prescriptions for preparation of children milk soup and meat extract. Discovered in urine hippuric acid, creatinine, and tyrosine as the product of casein degradation. His works concerning extractive substances of the skeletal muscles are classic; he found in muscles inosinic acid, showed an accumulation of lactic acid in the muscle during its work, established the structure of creatine, creatinine, and sarcosine. Bibliography and literature: see Great Medical Encyclopedia, Third Edition; Great Soviet Encyclopedia, Third Edition.

July 6 – 100th anniversary of the birth of H. Theorell (1903–1982), Swedish biochemist, member of the London Royal Society. His main works were dedicated to studies on the nature and action mechanism of oxidative enzymes. He established the involvement of many vitamins (in particular, those of the B group) in biochemical reactions as coenzymes; for the first time prepared crystalline myosin that promoted further studies on the structure of this protein; also studied properties of alcohol dehydrogenase. In 1955 he won the Nobel Prize in Physiology and Medicine for discoveries concerning the nature and action mechanism of oxidative enzymes. Bibliography: *The Reaction between Catalase, Aridyl, and Hydrogen Peroxide* (1952) *Arch. Biochem.*, **41**, 462 (with A. Ehrenberg); *The Molecular Weight and FMN Content of Crystalline "Old Yellow Enzyme"* (1956) *Arch. Biochem.*, **65**, 439 (with A. Anason). Literature: see Great Medical Encyclopedia, Third Edition; *The Nobel Prize Winners*, in *The Encyclopedia: M-Ya* (1992) Progress, Moscow; *New York Times* (1955) October 23.

July 31 – 50th anniversary of the death of Nikolai Dmitrievich Zelinsky (1861–1953), Russian organic chemist, Academician of the USSR Academy of Sciences, winner of the Lenin Prize (1934) and of three State Prizes (1942, 1946, 1948). From 1917 he worked in Moscow University. His main works are in organic chemistry, organic catalysis. In the field of biology and medicine he elaborated methods for synthesis of amino acids and their esters (1906–1911), the method of a soft hydrolysis of proteins (1912–1914); created the diketopiperazine theory of protein structure (1923) combined with the polypeptide theory (1947–1948). He studied chemistry of hormones of the androsterone group, bacteriostatic properties of fatty acids, and for the first time synthesized a fatty acid cygerol which is used in medicine. Bibliography

and literature: see Great Medical Encyclopedia, Third Edition.

September 4 – 90th anniversary of the birth of S. Moore (1913-1982), American biochemist, member of the US National Academy of Sciences. He used ion-exchange chromatography for chemical analysis, developed chromatographic methods of separation of mixtures of amino acids and of their quantitative determination, constructed an automated amino acid analyzer widely used also in clinical biochemistry (jointly with W. Stein); proposed the use of fluorecamine for determination of submicroscopic amounts of amine nitrogen. Won the 1972 Nobel Prize in Chemistry (jointly with C. Anfinsen and W. Stein) for the contribution to elucidation of the correlation between the chemical structure and catalytic effect. Bibliography and literature: see Great Medical Encyclopedia, Third Edition; *The Nobel Prize Winners*, in *The Encyclopedia: M-Ya* (1992) Progress, Moscow; *The World Biographic Encyclopedic Dictionary* (2000); Great Russian Encyclopedia, Moscow; *Science* (1972) November 3.

September 16 – 150th anniversary of the birth of A. Kossel (1853-1927), German biochemist, member of the Swedish Royal Academy of Sciences. In 1879 he isolated nuclein from starch; together with students found that nucleic acids consist of nitrogen-containing bases, such as thymine, cytosine, and uracil; concluded that thymine played an important role in tissue growth and was not an energy source for muscle cells; isolated the protein-like substance histone from nuclei of goose blood cells; developed a first concept on the building elements of the cell; established that amino acids, sterols, purines, and pyrimidines available in all animal and plant cells were building blocks for various physiological processes. In 1885-1901 jointly with students he discovered a number of amino acids (including histidine). Won the 1910 Nobel Prize in Physiology and Medicine for the contribution to chemistry of the cell by studies on proteins including nuclein substances. Bibliography: *Die Gewebe des Menschlichen Körpers und Ihre Mikroskopische Untersuchung* (1899), Braunschweig (with others); *The Proteins and Histones* (1928). Literature: *The Nobel Prize Winners*, in *The Encyclopedia: A-L* (1992) Progress, Moscow; Forbes, E. (ed.) (1961) *Great Chemists*; Jones, M. E. (1953) *Albrecht Kossel - a Biographical Sketch*, *Yale J. Biol. Med.*, **26**, 80.

October 22 – 100th anniversary of the birth of G. Beadle (1903-1989), American biochemist and geneticist, member of the London Royal Society. He contributed to knowledge of the genetic control of metabolism, physical and chemical bases of heredity. Won the 1958 Nobel Prize in Physiology and Medicine (joined with E. Tatum and D. Lederberg) for the discovery of genetic regulation of chemical processes. Bibliography: *The Language of the Gene* (1961); *Genetics and Modern Biology* (1963). Literature: see Great Medical Encyclopedia, Third Edition; Great Soviet Encyclopedia,

Third Edition; *Current Biography* (1956) April; *Time* (1958) July 14; *The Nobel Prize Winners*, in *The Encyclopedia: A-L* (1992) Progress, Moscow.

October 26 – 90th anniversary of the birth of Ilya Borisovich Zbarskii (1913, born in the town of Kamenets-Podolsky), Russian biochemist, Academician of the Russian Academy of Medical Sciences. He was the organizer and leader of Biochemical Laboratory in the Herzen Oncological Institute (1945-1959). During 1956-1980 he was the leader of the Laboratory of Cellular Structures, Institute of Animal Morphology, the USSR Academy of Sciences (now Institute of Developmental Biology, Russian Academy of Sciences), from 1989 he is the Board Councilor at this Institute. He organized the Chair of Medical Chemistry in the Central Advanced Training Institute for Physicians (now the Moscow Medical Academy of Postgraduate Education). He studied proteins and nucleic acids of normal and tumor cells and cell structures, their composition, metabolism, and enzymatic activity; isolated, fractionated, and biochemically characterized cell nuclei and nuclear ultrastructures. In 1979 he discovered (with others) the ability of non-histone proteins of the cell nucleus to produce non-chromatin structures (nuclear matrices); contributed to studies on high-molecular-weight proteins of the nuclear matrix; created a scientific school of studies on biochemistry and genetic apparatus of the cell nucleus. Bibliography: see Great Medical Encyclopedia, Third Edition; *Organization of the Cell Nucleus* (1988) Meditsina, Moscow; *B. I. Zbarsky (1885-1954)* (1990) Moscow (jointly with P. F. Nikolaev); *Skeletal Structures of the Cell Nucleus* (1991) Nauka, Moscow (with others). Literature: see Great Medical Encyclopedia, Third Edition; *70th Anniversary of Prof. I. B. Zbarsky* (1984) *Vopr. Med. Khim.*, No. 1, 141-142; *I. B. Zbarsky (The 85th Anniversary)* (1998) *Vestn. Ros. Akad. Med. Nauk*, No. 10, 60-61.

October 30 – 75th anniversary of the birth of D. Nathans (born 1928), American virologist, a specialist in molecular biology. He contributed to studies on the relation between the structure and functions of the viral genome; using restriction nucleases, cleaved for the first time (with colleagues) DNA of the SV-40 simian virus; prepared the so-called "evolutionary" mutants of SV-40 and also its hybrids with adenoviruses. His works promoted the development of genetic engineering. Won the 1978 Nobel Prize (joined with W. Arber and X. Smith) in Physiology and Medicine for discovery of restriction enzymes and for methods of their use for changes in molecular genetics. Bibliography and literature: Yearbook of the Great Soviet Encyclopedia (1978); *Biologists: Reference Book on Biographies* (1984) Naukova Dumka, Kiev; *The Nobel Prize Winners*, in *The Encyclopedia: M-Ya* (1992) Progress, Moscow; *The World Biographic Encyclopedic Dictionary* (2000); Great Russian Encyclopedia, Moscow; *Science* (1978) December 8.

December 11 – 25th anniversary of the death of V. du Vigneaud (1901-1978), American biochemist, member of the American National Academy of Sciences. He investigated the chemical composition of insulin; succeeded in isolation of the amino acid cystine from insulin crystals; in 1936 synthesized (with colleagues) glutathione, a tripeptide containing cysteine, glycine, and glutamic acid; studied the structure of biotin (1945); in 1946 developed with colleagues the synthesis of penicillin; was the first to prepare crystalline oxytocin, i.e., synthesized *in vitro* a

polypeptide hormone. Won the Nobel Prize in Chemistry in 1955 for the work with biologically active compounds and first of all for the first synthesis of the polypeptide hormone. Bibliography: *A Trail of Research in Sulfur Chemistry and Metabolism and Related Fields* (1952) New York; *The Synthesis of Oxytocin* (1954); *J. Am. Chem. Soc.*, **76**, 3115 (with others). Literature: *The Nobel Prize Winners*, in *The Encyclopedia: A-L* (1992) Progress, Moscow; *New York Times* (1978) December 12; Great Medical Encyclopedia, Third Edition.