
CHRONICLES

Notable and Anniversary Dates in Biochemistry for 2004

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200th anniversary of the first application of chemical and physical laws for explanation of general biological phenomena; the idea of substance turnover was proposed as one of the most important manifestations of life (A. Sniadecki, 1804).

150th anniversary of the development of the concept of the organism's "internal medium" as a stable balance of chemical and physical processes responsible for normal course of life functions (C. Bernard, 1854-1857).

150th anniversary of the synthesis of taurine, which is involved in digestion and assimilation of fats and lipids (A. Strecker, 1854).

75th anniversary of the discovery of vitamin K (H. Dam, 1929).

75th anniversary of the preparation of thyroid-stimulating hormone (L. Loeb, M. Aron, 1929).

50th anniversary of the establishment of the structures of the hormones oxytocin and vasopressin and the synthesis of oxytocin (V. Vigneaud, 1954).

January 5 – 90th anniversary of the birth of Ferenz Straub (1914), Hungarian biochemist, member of the Hungarian Academy of Sciences (1949). He was director of the Biological Research Institute in Szeged (1971-1978) and of the Institute of Enzymology, Hungarian Academy of Sciences (from 1979). He studied enzymes of muscular tissue; for the first time isolated lipoamide dehydrogenase and lactate dehydrogenase; studied features of some other enzymes. He discovered the second component of the contractile muscular protein, actin, which performs muscle functions in complex with myosin. Contributed to studies on protein biosynthesis using model systems of animal tissues and bacteria. A number of his works concern the structure and features of enzymes of glycolysis and proteolysis, and also of enzymes of cyclic nucleotide metabolism. Straub is an author of a number of textbooks on biochemistry and chemistry. Bibliography and literature: see Great Medical Encyclopedia, Third Edition; Great Soviet Encyclopedia; Yearbook 1989; *International Who's Who* 1990-1991 (1990) London.

February 6 – 200th anniversary of the death of Joseph Priestley (1733-1804), English chemist, member of the London Royal Society (1767), the Paris Academy of Sciences (1777), and Honorable Member of the St. Petersburg Academy of Sciences (1780). He showed that air spoiled by burning or movement became suitable for respiration under the influence of green parts of plants (1771). He for the first time (1772-1774) obtained hydrogen chloride and ammonium; in 1774, he discovered oxygen. He prepared pure silicon fluoride, sulfurous gas (1775), and carbon monoxide (1799). He is the author of valuable works on history of science and methodology of scientific research. Bibliography and literature: see Great Soviet Encyclopedia, Third Edition; *Selected Works* (translated from English) (1934) Moscow.

March 14 – 150th anniversary of the birth of Paul Ehrlich (1854-1915), German physician, pharmacologist, immunologist, and biochemist, one of the initiators of chemotherapy. He established the existence of different kind of leukocytes, the significance of bone marrow for generation of granulocytes, differentiated certain leukemia forms, and proposed a dual theory of hemopoiesis (1880-1898). He found in connective tissue the so-called mast cells, was the first to find the existence of blood-brain barrier. He elaborated specific staining of tubercle bacillus and multicolor staining of blood smears and histological preparations (the staining of Ehrlich-Biondy). He organized the first station for serum monitoring, developed approaches for determination of activity of antitoxic sera and *in vitro* study on the antigen-antibody reaction. He suggested that cells responsible for immune reactions should have on their surface antigen-recognizing structures, receptors; established (with Yu. Margenroth) (1899) that antigens could selectively bind the corresponding antibodies in immune serum; introduced concepts of hetero-, iso-, and autohemolysins. His works on treatment of human spirillosis and syphilis with organic arsenic compounds became known. In 1907, he developed the highly effective preparation 606 (salvarsan) for treatment of syphilis. He proposed for clinical practice a number of

laboratory reactions, including the determination of indole and its derivatives (Ehrlich's reaction). In 1908, he won the Nobel Prize in Physiology and Medicine (jointly with I. Mechnikov) for works in immunology. Bibliography: see Great Medical Encyclopedia, Third Edition; *Grundlagen und Erfolge der Chemotherapie* (1911) Leipzig. Literature: Great Medical Encyclopedia, Third Edition; *The Nobel Prize Winners*, in the *Encyclopedia: M-Ya* (1992) Progress, Moscow; William, J. H. (1951) *Between Life and Death*.

May 19 – 90th anniversary of the birth of Max Perutz (1914-2002), English biochemist (of Austrian origin), member of the American National and French Academies of Sciences and the London Royal Society (1954). He started his works by searches for ordering in the structure of protein molecules using X-ray diffraction improved by him and solved the problem in 1953. In 1960, he proposed a model of the three-dimensional structure of hemoglobin. In 1962, he won the Nobel Prize in Chemistry (jointly with D. Kendrew) for studies on the structure of globular proteins. Bibliography: see Great Medical Encyclopedia, Third Edition; Great Soviet Encyclopedia, Third Edition; *Proteins and Nucleic Acids: Structure and Function* (1962) Amsterdam. Literature: Great Medical Encyclopedia, Third Edition; Great Soviet Encyclopedia, Third Edition; *The Nobel Prize Winners*, in the *Encyclopedia: M-Ya* (1992) Progress, Moscow; *New Scientist* (1974) October 3.

June 3 – 75th anniversary of the birth of Werner Arber (1929), Swiss biologist and geneticist. In 1962, he revealed (with colleagues) the limitation mechanism caused by a host cell and formulated the principle of strain-specific restriction and modification of DNA. He discovered enzymes of the restriction–modification system as a new class of enzymes specifically interacting with DNA and directed against heterologous DNA; formulated main principles of action of the restriction–methylase system. He was the Nobel Prize winner of 1978 in Physiology and Medicine (jointly with D. Nathans and H. Smith) for detection of restriction enzymes and their application in molecular genetics. Literature: *Priroda* (1979) No. 1, 106-107; *Science* (1978) December 8; *The Nobel Prize Winners*, in the *Encyclopedia: A-L* (1992) Progress, Moscow.

July 1 – 75th anniversary of the birth of Gerald Edelman (1929), American biochemist, member of the American National Academy of Sciences (from 1965). He elaborated (jointly with R. Porter) a chemical method for decomposition of antibody molecules into separate fragments and showed (1959) these molecules to consist of two types of peptide chains (heavy and light) and this structure to be common for antibodies. He determined the structure of the molecule of one of the immunoglobulins and proposed a hypothesis for the tertiary structure of the antibody active site (1962); elaborated fluorescent spectroscopy of macromolecules. In 1972, he won the Nobel

Prize in Physiology and Medicine for discoveries concerning the chemical structure of antibodies (jointly with R. Porter). Bibliography: *Some New Views on the Cell Surface* (1976) *J. Biochem. (Tokyo)*, **79**. Literature: Great Medical Encyclopedia, Third Edition; *The Nobel Prize Winners*, in the *Encyclopedia: M-Ya* (1992) Progress, Moscow; *Science* (1972) October 27.

July 29 – 100th anniversary of the birth of Il'ya Il'ich Ivanov (1904-1977, born in village of Shchigry, Shchigrovskii uezd, Kursk guberniya), Russian biochemist, Academician of the USSR Academy of Medical Sciences, Professor of the First Moscow Medical Institute (1945-1952, now Sechenov Moscow Medical Academy), and Chief of the Chair of Medical Biochemistry, Leningrad Pediatric Medical Institute (1955-1962, now St. Petersburg Pediatric Medical Academy). From 1962-1977, he was Chief of the Chair of Biochemistry, Military Medical Academy. His works concern biochemistry of movable cells (spermatozoa, trypanosomes), muscles, radiation damage, and malignancies, and also clinical enzymology and biochemistry of helminths. He studied the fractional composition of muscle proteins in different stages of ontogeny in norm and disease, developed a method for isolation and study of fractions of muscle proteins, a biochemical test for assessment of disorders in the contractile function of muscles after poliomyelitis. He showed that mammalian spermatozoa can move under anaerobic conditions, revealed the interrelation between the aerobic and anaerobic metabolism in sperm cells, their endogenous energy substrates, and also the role of adenosine triphosphate in metabolism and its influence on spermatozoon movement. He proposed a general theory of radiation damage development in late stages of radiation sickness in connection with the damage of nuclear DNA and disorders in the transcription of messenger RNA. A number of his studies concern comparative and evolutionary biochemistry of parasitic worms. Bibliography: see Great Medical Encyclopedia, Third Edition.

August 6 – 25th anniversary of the death of F. Lynen (1911-1979), German biochemist, member of the American National Academy of Sciences, German Leopoldina Academy of Naturalists, and other academies. He studied intermediary metabolism, oxidation, and biosynthesis of fatty acids, synthesis of cholesterol, action mechanism of biotin and biotin-derived enzymes. Together with other scientists, he explained the mechanism of fatty acid synthesis. He was the first to isolate acetyl coenzyme A (1951). In 1964, he won the Nobel Prize in Physiology and Medicine (jointly with K. Bloch) for discoveries concerning the mechanism and regulation of cholesterol and fatty acids. Bibliography: see Great Medical Encyclopedia, Third Edition; *Biosynthesis of Saturated Fatty Acids* (1961) *Fed. Proc.*, **20**, 941. Literature: Great Medical Encyclopedia, Third Edition; *The Nobel Prize Winners*, in *Encyclopedia: A-L* (1992) Progress, Moscow; *Science* (1963) October 23.

August 16 – 100th anniversary of the birth of W. Stanley (1904-1971), American biochemist and virologist. He isolated in crystal form the tobacco mosaic virus (1935) and some other viruses. He was the first to show that viruses can exist as nucleoproteins. In 1946, he won the Nobel Prize in Chemistry for preparation of pure enzymes and viral proteins (jointly with J. Sumner and J. Northrop). He was an adherent of the viral theory of tumorigenesis. Bibliography: see Great Medical Encyclopedia and Great Soviet Encyclopedia, Third Editions; *Viruses and the Nature of Life* (1961) (with E. Valens). Literature: Great Medical Encyclopedia and Great Soviet Encyclopedia, Third Editions; *The Nobel Prize Winners*, in *Encyclopedia: M-Ya* (1992) Progress, Moscow; *New York Times* (1971) June 16.

September 10 – 75th anniversary of the birth of Robert Georgievich Glushkov (1929, born in Moscow), Russian organic chemist, specialist in the synthesis of drugs, Academician of the Russian Academy of Medical Sciences. From 1982, he was Director of the Ordzhonikidze All-Union Chemical and Pharmaceutical Institute, from 1989 Director of the Center of Drug Chemistry, All-Russian Chemical and Pharmaceutical Institute. His main works concern the development of approaches for synthesis of drugs and also chemistry of mono- and polynuclear nitrogen-containing heterocyclic compounds. He elaborated (with colleagues) an antidepressant, inkasan, and an antitumor drug, fopurin. He developed methods of industrial synthesis of klofelin (in 1979 he won Gold Medal of the All-Union Exhibition of National Economy Achievements), pyracetam, allopurinol, ketamin, gemfibrosil, pyrasidol, nibentan (1998), and other drugs. For development of new drugs, he won the State Prize (1981). He is Editor-in-Chief of *Khimiko-Farmatsevticheskii Zhurnal*. Bibliography: see Great Medical Encyclopedia, Third Edition; *Synthetic Drugs* (1983) Moscow (with L. N. Yakhontov). Literature: R. G. Glushkov (1999) *Vestn. Ros. Akad. Med. Nauk*, No. 9, 60; *Khim.-Farm. Zh.* (1999) No. 8, 5-6.

October 7 – 50th anniversary of the death of Boris Il'ich Zbarsky (1885-1954, born in the town of Kamenets-Podolsk), Russian biochemist, Academician of the USSR Academy of Medical Sciences, winner of the State Prize (1944). Together with A. N. Bach he participated in organization of the Karpov Chemical Institute (1918) and of Biochemical Institute (1920, now Bach Institute of Biochemistry). From 1930 he was Director of the Institute of Nutrition, the leader of the Laboratory of Biochemistry of Cancer (1945-1952), Chief of the Chair of Biochemistry, First Moscow Medical Institute (1934-1954, now Sechenov Moscow Medical Academy). He directed the laboratory at the V. I. Lenin Mausoleum (1924-1954). Jointly with V. P. Vorob'ev, he embalmed the corpse of Lenin. His main works are in the field of protein metabolism and biochemistry of malignant tumors, the role of erythrocytes in metabolism of amino acids.

Bibliography and literature: see Great Medical Encyclopedia and Great Soviet Encyclopedia, Third Editions; B. I. Zbarsky (1985) *Vopr. Med. Khim.*, No. 4, 141-142; Stenberg, A. I., B. I. Zbarsky and His Role in the *Development of Science on Nutrition* (1989) *Vopr. Pitaniya*, No. 1, 75-77.

October 19 – 80th anniversary of the birth of Temirbolat Tembolatovich Berezov (1924, born in the village of Gimara, Kazbek region, Georgia), Russian biochemist, Academician of the Russian Academy of Medical Sciences, Honored Worker of Science and Technology. He was the organizer and Chief of the Chair of Biochemistry, Medical Department, Russian University of People's Friendship (1962-1996). His studies concern specific features of amino acid metabolism in malignant tumors. He proposed a hypothesis of the inverse dependence between the intensity of tumor growth and activities of enzymes of amino acid decomposition, detected some molecular mechanisms of regulation of synthesis and activity of key enzymes of nitrogen metabolism in different human and animal tumors, developed diagnostic enzymatic tests and a biochemical approach for preparation of antitumor drugs of bacterial origin based on different sensitivity of normal and tumor cells to shortage of indispensable growth factors, such as amino acids. He established that leukocytes of patients with lympholeukemia are unable to synthesize asparagine required for their existence, developed approaches for differential diagnosis of tumors and enzymatic express methods for early diagnosis of myocardial infarction. He also elaborated methods for isolation and purification of bacterial enzymes and their use for treatment of animal malignant tumors. Bibliography: see Great Medical Encyclopedia, Third Edition, Vol. 10, 504; *Biological Chemistry: Textbook for Medical Students*, Third Edition, revised (1998) Meditsina, Moscow (jointly with B. F. Korovkin); [First Edition (1982) Moscow; Second Edition (1990) Moscow (translated into English) (1992) Moscow]. Literature: T. T. Berezov (1999) *Vestn. Ros. Akad. Med. Nauk*, No. 10, 60-61.

December 21 – 100th anniversary of the birth of Vitalii Sergeevich Il'in (1904-1976, born in the village of Dzhambai, Dengiz region, Gur'ev oblast, Kazakhstan), Russian biochemist, Academician of the USSR Academy of Medical Sciences. From 1940, he was the Chief of the Chair of Biochemistry in the Tadzhik Medical Institute and from 1945 in the Leningrad Stomatology Institute. From 1952, he was the leader of the Section of Biochemistry in the Institute of Experimental Medicine and Chief of the Chair of Clinical Biochemistry in the Leningrad Institute of Advanced Training for Doctors (now the St. Petersburg Medical Academy of Postgraduate Education). His main studies concern mechanisms of the nervous and hormonal regulation of enzymatic processes in animal tissues. He detected an involvement of the hemolytic factor in blood coagulation, isolated a pure fib-

rinolytic enzyme (fibrinogenase), and showed that the activity of this enzyme in blood is regulated by the nervous system. He discovered (jointly with G. V. Tigova) a direct effect of insulin and also of a number of neuropituitary and steroid hormones on the conformation of enzymatic proteins and isolated a hormone–enzyme complex (insulin–hexogenase). He formulated a concept of the unitary effect of insulin on metabolism. In studies on biochemical bases of nervous trophics, he showed that the nervous system regulates the synthesis of enzymes in cytostructures of the body's tissues and that these regulating effects are realized in the genetic system of the cell nuclei. Bibliography and literature: see Great Medical Encyclopedia, Third Edition.

25th anniversary of the death of Vasilii Nikolaevich Bukin (1899-1979, born in the village of Znamenskoe, now Penza oblast), Russian biochemist, Corresponding Member of the USSR Academy of Sciences, a specialist in

biochemistry of vitamins. In 1932-1938 he was working in the Institute of Plant-Growing (Leningrad) where he organized one of the first Soviet laboratories of vitamins, from 1938 he worked in the Institute of Biochemistry, the USSR Academy of Sciences, and concurrently (from 1943) was Professor in the Moscow Technological Institute of Food Industry. He participated in the organization of the Chair of Vitamin Technology in this Institute. His main works concern biosynthesis of vitamins, their role in metabolism, and methods of their preparation. He was winner of the State Prize (1949) and the A. N. Bach Prize (1963). He contributed the creation of the vitamin industry in the USSR and promoted many important proposals for production of vitamin concentrates and preparations. Bibliography and literature: see Great Soviet Encyclopedia, Third Edition; Kretovich, V. L. (1984) *V. N. Bukin*, in: *Essays on History of Biochemistry in USSR*, Moscow, pp. 74-75.