

Review articles

Research Concepts and Contributions of Acad. Assen I. Hadjiolov for the Development of Morphology in Bulgaria on the Occasion of His 105th Anniversary

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The development and consolidation of morphology in Bulgaria is firmly fused with the name of Acad. A. I. Hadjiolov. He is one of the founders of the Bulgarian morphological scientific school. Acad. A. I. Hadjiolov is one of the most prominent representatives of morphological science and one of the leading scientists in the field of the biological and medical thought in our country. This year the scientific community celebrates the 105th anniversary of the birth of the outstanding Bulgarian and world-known scientist and active public figure Acad. Assen Ivanov Hadjiolov

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This year the scientific community celebrates the 105th anniversary of the birth of the outstanding Bulgarian and world-known scientist and active public figure Acad. Assen Ivanov Hadjiolov. He is one of the most prominent representatives of morphological science and one of the leading scientists in the field of the biological and medical thought in our country. The development and consolidation of morphology in Bulgaria is firmly fused with the name of Acad. Assen Hadjiolov. He is one of the founders of the Bulgarian morphological scientific school.

He was born on January 6th 1903 in the village of Shirokovo (Rousse region). He has graduated from the People's State Men's Secondary School "Konstantin Fotinov" in the town of Smolyan (1920) and Medical Faculty of Sofia University (1926). He has also attended studies in philosophy and psychology at the Sorbonne in Paris (1926-1927). He has also made his PhD degree in the sciences in Lyon (1929). He has been

elected and nominated consecutively as follows: assistant-professor at the Chair of Histology and Embryology at the Medical Faculty in Sofia (1928), associate professor (1930), full professor (1945), corresponding-member at the Bulgarian Academy of Sciences (1947) and full member-academician (1952).

In his over 1000 papers, monographs and textbooks important studies on the histochemistry of lipids, the proper luminescence of cells and tissues, cytobiology and histobiology of the sexual, connective, blood, nervous and epithelial tissues have been highlighted. Acad. A. I. Hadjiolov has developed the concept of the tissue organoid; he has offered a histobiological classification and systematization of the tissues and organs, etc. These are well-known not only in Bulgaria, but throughout the world as well. He is the author of a number of textbooks and monographs in cytology, histology, embryology and haematology. In the field of morphological sciences acad. Asen I. Hadjiolov has numerous and original contributions with international recognition. He has profoundly developed the concept of the "Morphological metabolism of lipids". Acad. A. I. Hadjiolov has also created and developed a theoretical concept of the structure and evolution of cells up till their integration in the so-called "tissue organoid". His ideas on the classification of the tissues are also of importance. He has attached to the accepted and recognized four classical tissues in histology (epithelial, connective, muscle and nervous tissues) yet another two – the sexual and blood ones.

Acad. A. Hadjiolov is the founder of luminescent microscopy in Bulgaria. In the field of the luminescent analysis of the cells and tissues he has published as early as 1930 a monograph named: "A study on the actinoluminescent properties of the tissues by filtered ultraviolet rays. The light of Wood and its application in histology and medicine". He has isolated from frog's skin three fractions pterine (ranopterines) and has proved their effect on the proliferation and differentiation of haemopoietic cells.

For the first time in literature in 1966 in collaboration with J. Jordanov et al. he has described the ultrastructural organization of the so-called vitellin body of Balbiani in the ooplasm of chicken oocyte as complex of a centrosomes, mitochondria, and Golgi vesicles cisterns.

Of importance are also his investigations on the action of ionizing irradiation on sexual tissue. They bring about to the revealing at the cellular level of the differing degrees of radio-sensitivity at the different degrees of radio-sensitivity at the different stages of spermatogenesis and oopoesis. Also provoking an interest are his studies in 1977 conducted in collaboration with A. Manina, E. Zaprianova, A. Boyadjieva et al. on the adaptational – compensatory reaction of the brain upon irradiation [5].

The tributes of Acad. Hadjiolov in the area of studies on the blood, sexual and nervous tissues reviewed in his profound works: "On the sexual and blood tissues" (1932); "Historical and the theoretical survey of the blood tissue" (1941); "Textbook in histology and microscopic anatomy" (1946 - 1958); "Fundamentals of haematology" (1950); "Methodological Importance of the Tissue and Organ Biology" (1959); "The Problem of monocytes and macrophages from the point of view of organ biology" (1961); "An attempt for a physical-chemical and colloidal theory of cariokinesis with respect to the phylogenesis of the cell and tissues" (1961), etc.

His investigations carried out in the period 1958-1968 in collaboration with N. Damova et al. on the nervous system pertain mainly to the embryonic development of the cerebral hemispheres in the human. They contribute to the establishing of certain dependencies and facts in the morpho- and histogenesis of the hemispheres.

For the first time in the Bulgarian individual the system of the erythrocyte glutamatepyruvate transaminases has been characterized by A. I. Hadjiolov, E. Yaneva et al. in the period of 1979-1986 for the separation of which an own method has been devised. A number of other novel methods created by A. I. Hadjiolov et al. have been

introduced in practical application. Methods for histochemical detection of lipids in the cells and tissues by hydrotropic solutions of lipid dyes based on new principles have been created by A. I. Hadjiolov et al. The hydrotropic method created by A. I. Hadjiolov et al. The hydrotropic method of Hadjiolov has been adopted in the world histochemical practice and is reviewed in most of the histochemistry manuals. In 1972 A. I. Hadjiolov has created together with E. Zvetkova a fluorescent-cytochemical method for nuclear fluorochroming with berberin-sulphate after DNA-denaturation. This method based on the differing intensity of light and morphology of the eu- and heterochromatin in the bone marrow allows for a good differentiation between the mature normal cells and both the immature and neoplastic ones. They have also described a fluorescent – cytochemical method with acridine yellow for proving the acidic glucosaminoglycans and epithelial mucines on crystal sections. This method is fast and widely used in practice [1]. His studies in the fields of history and popularization of science are also of contributing nature.

Acad. A. I. Hadjiolov was not a highly knowledgeable scientist but also a long-years profound teacher and good organizer of science in our country. He created the Bulgarian morphological school with dozens of disciples and followers. During his 40-year long teaching career he has been supplying deep histological knowledge on the structure of the organism and its alteration in norm and pathology to his thousands of students and PhD graduates. With his legacy is also connected the building and development of major research and teaching scientific institutions. The scientific and staff work contributions of Acad. A. I. Hadjiolov are also very significant as a long-standing Head (Chief) of the Chair in Histology and Embryology at the Medical Faculty (Department) of Sofia University (1930-1968). In 1947 acad. A. I. Hadjiolov together with acad. D. Orahovetz have laid the foundations of (have found) the Institute of Experimental Medicine at the Biology Department of the BAS. Acad. A. I. Hadjiolov has been elected Deputy-Director (1952-1953) and Head (Chief) of the Section of Histology, Embryology and Experimental Medicine (1947-1953). He is the founder and first Director of the Institute of Morphology at the Department of Biological and Medical Sciences at the Bulgarian Academy of Sciences in Sofia and has been elected Head of the Department of comparative embryology in the same institute (1953-1974). Under his guidance the Institute of Morphology – BAS has grown to be the leading scientific institution in our country, developing at the international level a number of up-to-date significant trends in the fields of morphology and anthropology.

He has taken an active participation in a number of academic managerial activities being elected as follows: Deputy Scientific secretary of BAS (1950-1953); Scientific Secretary of BAS (1953-1956) and Chief Scientific Secretary of BAS (1955-1956).

For his merits as a brilliant organizer and outstanding scientist he has been elected deputy-chairman of the Bulgarian Doctors' Union and Chairman of its Sofia branch. He is also founder of the Union of Scientists in Bulgaria and its first Chairman (1944-1990). He was also elected Chairman of the newly created Association of the Bulgarian anatomists, histologists and embryologists (1959-1967) [2, 3, 4, 6].

Acad. A. I. Hadjiolov is a long-standing member of the Editorial Board at BAS (1956-1973), "The Journal of BAS" and "Nature", "Praemedicus", etc.

With his broad vision on the organization and development of science and morphology he has authoritatively represented Bulgarian science and BAS at numerous international forums and meetings.

The high estimate given by our and the world scientific community is expressed in his election as first Chairman and founder of the Union of Scientists and the Bulgarian association of anatomists, as member of the National Commission and Chairman of the Department of Physical-Mathematical and Natural Sciences at UNESCO, correspon-

ding-member of the Department for Space Biology at the International Association in Space science, corresponding-member of the International Academy in the History of Science in Paris, member of the Board of the International Association of the Francophon Anatomists, etc.

The recognition for his significant scientific contributions abroad is also his election as an honorary member of the Hungarian Academy of Sciences, Doctor Honoris Causa of the Budapest Medical University, corresponding member of the Yugoslav Academy of Sciences and Arts in Zagreb, honorary member of the Czechoslovak Medical Association "Jan Purkinje", etc.

For his great scientific merits in the field of histology he has been conferred prestigious titles and awards: "Laureate of Dimitrov Award" (1951), "Merited Scientific Activist" (1963), twice bearer of the "Cyrill and Methodius" order, etc.

Acad. A. I. Hadjiolov passed away on June 1st 1994 in Sofia.

References

1. Hadjiolov, A. I., E. Zvetkova. A new berberine sulphate nuclear fluoro-chromic technique applied for detection of cell maturity and malignization. – *Compt. rend. Acad. bulg. Sci.*, **25**, 1972, No 12, 1725-1726.
2. Акад. Асен Иванов Хаджиолов. – В: *Институт по експериментална морфология и антропология 1953–2003* (под ред. на ст.н.с. д-р Йордан Йорданов, дмн). С., Академично издателство „Марин Дринов“, 2003, 13–16.
3. Йорданов, Ж., З. Бояджиева. Асен Иванов Хаджиолов. Биобиблиография. С., Издателство на Българската академия на науките, 1990. 365 с.
4. Куртев, В. Ганева, П. Серафимов. Хаджиолов, Асен Иванов. – В: *Дейци на българската медицина и здравеопазване*. (под ред. на А. Малеев). С., Медицина и физкултура, 1986. 368 с.
5. Манина, А., А., Р. П. Кучеренко, А. И. Хаджиолов, Э. Запriansova, А. Бояджиева – Михайлова, М. Бакалска – Нешева. Адаптационно-компенсаторная реакция головного мозга при облучении. – *Арх. анат., гист., эмбр.*, **42**, 1977, No 5, 20-26.
6. Узунов, Г. Академик Асен И. Хаджиолов. Жизнен път и творчество. – *Известия на Института по морфология*, **9–10**, 1964, 5–6.