

## REVIEW

From **Prof. Dr. Dimitar Stefanov Kadiysky, Doctor of Medical Sciences,**

Institute of Experimental Morphology, Pathology and Anthropology with Museum (IEMPAM) at BAS, Academician Georgi Bonchev Str., bl. 25, 1113 Sofia; Member of the Scientific Jury of the competition for the academic position "Professor" under Order RD - 251 / 29.09.2021 of Mr. Rector of the University "Prof. Dr. Assen Zlatarov ", Bourgas.

**Subject:** Conducting a competition for the academic position of "professor" in the scientific specialty "Anatomy, Histology and Cytology", field of higher education 7. Health and sports, professional field 7.1. Medicine, for the needs of the Department of Anatomy, Histology and Cytology at the University "Prof. Dr. Assen Zlatarov".

Documents on the announced competition were submitted only by Associate Professor Dr. Ivaylo Stefanov Stefanov, Doctor of Veterinary Medicine, Associate Professor in the Department of Anatomy, Faculty of Medicine at the Thracian University - Stara Zagora.

The materials presented to me by the candidate (electronic and paper) are in full compliance with national regulations for academic positions and comply with the specific requirements of the regulations of the Faculty of Public Health and Health Care and the University "Prof. Dr. Assen Zlatarov "Bourgas.

All required documents are available.

### **I. Career profile of the candidate**

Associate Professor Dr. Ivaylo Stefanov Stefanov graduated in veterinary medicine in 1997 at the Faculty of Veterinary Medicine of the Thracian University of Stara Zagora with a qualification "Master of Veterinary Medicine".

After graduation, the candidate successively holds the degrees of career development as a scientist and teacher. From 2000 to 2003 he was an assistant in the Histology Department at the Department of Veterinary Cytology, Histology and Embryology at the Thracian University. Subsequently (from 2003 to 2004) Ivaylo Stefanov was a senior assistant in the Histology Department at the Department of Veterinary Cytology, Histology and Embryology at the same university. He worked again as an assistant from 2006 to 2007, but now in the Department of Anatomy, at the Department of Veterinary Anatomy, Histology and Embryology. As a senior assistant in the Department of Anatomy at the Department of Veterinary Anatomy, Histology and Embryology from 2007 to 2011 the candidate teaches all morphological disciplines. Since 2011 he has held the scientific position of "Chief Assistant" in the Department of Anatomy at the Department of Veterinary Anatomy, Histology and Embryology. To date, Ivaylo Stefanov is an associate professor at the Department of Anatomy at the Medical Faculty of the Thracian University, Stara Zagora (since 2016).

Associate Professor Ivaylo Stefanov received the scientific-educational degree "Doctor" in Anatomy, Histology and Cytology (decision № 0005 / 16.12.2011) after defending a dissertation on "*Morpho-functional features of the perianal sinus in dogs*" in 2011.

The additional postgraduate qualification and specialization of the candidate includes a three-month training (Short Term Scientific Missions - STSMs) on COST Action BM 1007 "*Mast Cells and Basophils - Targets for Innovative Therapies*" in Prague, Czech Republic at the Institute of Molecular Genetics of the Czech Academy of Sciences for the period from February 18, 2013 to May 18, 2013. Associate Professor Ivaylo Stefanov takes part in a working meeting on "*Application of confocal microscopy*", organized by YGVA (Young Generation of Veterinary Anatomists), Ljubljana, Slovenia, 8-10 July 2007. He visited the Department of Anatomy in Bursa, Republic of Turkey in 2012 for training (Erasmus Program), and since 18. 05 to 22.05. 2015 he was included in a lecture and practical course to teach "*Application of silicone elastomers in anatomy education*" at the Department of Anatomy at the Faculty of Veterinary Medicine, Ankara, Turkey under the Erasmus + Program.

Associate Professor Stefanov is a member of the Bulgarian Anatomical Society (BAS) since 2008, the European Association of Veterinary Anatomists (EAVA - European Association of Veterinary Anatomists) since 2012 and the Union of Scientists in Bulgaria - Stara Zagora branch.

The candidate's career growth simultaneously with the teaching activity includes active research work in several main morphological areas: - research on the distribution, histochemical, enzymohistochemical, immunohistochemical and morphometric characteristics of mast cells, -morphology of endocrine cells in bile ducts, bile ducts and bile ducts, - and microvascularization of the extrahepatic bile ducts,- study of the fine innervation of the extrahepatic bile ducts through the use of enzymohistochemical and immunohistochemical methods.

The attached reference for the study workload of the candidate summarizes more than 5 years of his work as a teacher. Good command of English has helped to be actively involved in the teaching of foreign students at the Medical Faculty of the Thracian University, Stara Zagora. The total annual workload of the candidate (between 260 and 450 hours) covers the required legal framework, and the range of teaching includes the entire morphological spectrum - anatomy, cytology, histology, embryology, mainly in preclinical I and II year students.

An integral part of the candidate's career development as a scientist is his participation in various research projects, which are evenly distributed in recent years. These are: NIJ №13-2017 at the Medical Faculty of the Thracian University on the topic: "Study of the distribution of mast cells in the skin, carotid body and brain in rats, as well as in the extrahepatic bile ducts of domestic pigs in the norm", NIJ 15 / 18 "Nicotinamide adenine dinucleotide phosphate diapharase (NADPH-d) in the intramurable part of the urethra in domestic pigs", NIJ 08/17 Distribution, histochemical and enzyme - chemical characteristics of mast cells in the bladder wall in domestic pigs ".

Associate Professor Stefanov participated in the publication of 6 textbooks printed to date, which unequivocally represent a significant facilitation in modern teaching and learning of morphological disciplines in the specifics of the Medical Faculty of the Thracian University. The candidate is the research supervisor of a doctoral student who successfully defended his dissertation in 2019. He has also published a monograph.

## **II. General description of the materials submitted in the competition**

Associate Professor Ivaylo Stefanov presents systematic documentation for his participation in this competition. The general impression when considering it is that the candidate has excellent scientific indicators, accumulated during his career growth.

His research work and experimental approaches in his development as a scientist led to the publication of 1 monograph and the publication of 18 works in various international and domestic scientific journals in full, in English. He is a leading author in 7 scientific publications (42.8% of all), in one of which he is an independent author. Six publications are with Impact Factor (IF), 8 are in journals with SJR, and 4 are in refereed journals without IF and SJR.

16 participations in scientific forums of different formats have been documented by the candidate.

Materials to be reviewed include results from research in the fields of anatomy, histology, cytology and embryology. The object of his research, reflected in his publication, are elements of macro- and microscopic anatomy, vascularization processes, histochemical, enzymohistochemical and immunohistochemical studies of the gallbladder, morphology of extrahepatic bile ducts and spinal ganglia. Much of the research work of Associate Professor Ivaylo Stefanov, included in the published results, is devoted to histochemical and immunohistochemical studies on mast cells in various organs of rat, pig and human. The micromorphological studies of the candidate, as can be seen from the presented publications, are specifically related to both the structural tissue characteristics and the pathology of a living organism.

The scientometric analysis of the research activity of Associate Professor Ivaylo Stefanov is clearly presented in a comparative scheme with points by groups of indicators, which is in line with the minimum requirements of *Law for the development of the academic staff* (LDAS) for the position of "professor" in science 7. Health and Sports, Professional 7.1. Medicine. It is evident that the candidate fully meets the requirements of the Regulations for the application of the LDAS in the Republic of Bulgaria, adopted by Council of Ministers 122 / 29.06.2018 and effective from 06.07.2018, effective at the time of announcing the competition in the State Gazette and of course submission of documents. In all indicators it meets the required minimum and in some of them it exceeds the number of points - especially in the groups of indicators G, D, E. For example, for the required 250 points in group G, it covers 318.7, and for the required 150 in group indicators D, he represents 360, and respectively for the required 120 points for group E, he has 123.8.

### **III. Evaluation of the candidate's scientific works**

#### *General characteristics of scientific production and publishing activity*

The presented 18 scientific publications of Associate Professor Stefanov have been published in international and Bulgarian scientific journals in full text, in English. Associate Professor Ivaylo Stefanov is the author of 1 monograph on "*Morphometric, histochemical and immunohistochemical characteristics of mast cells in the gallbladder and extrahepatic bile ducts in domestic pigs*" (author: Ivaylo Stefanov Stefanov, publishing house KOTA - Stara Zagora, 2021).

He is a leading author in 7 scientific publications (42.8%), in one of which he is an independent author, in 5 he is a second author, and in 7 - a last author. Six of the publications are with Impact factor - some of which are high, e.g. *Biotechnology & Biotechnological Equipment*. Eight publications are in journals with SJR, and 4 in refereed journals without IF and SJR.

#### *Scientific activity and achievements*

The scientific activity of the candidate is reflected in the registered citations (12) and the presentation of the obtained results in scientific forums (16). The original and confirmatory contributions of the candidate are in several important areas. The scientific contributions in the field of macroscopic, microscopic anatomy and vascularization highlight new information about the vascularization of the gallbladder in

pigs, obtained by using the corrosion method. New data on variations in the origin of *A. cystica* have been brought to the attention of morphologists (unlike humans, 4 variations have been identified and described here). The completely new description of the origin of *R. dexter medialis* alone or together with *R. quadratus*, *A. gastroduodenalis* and *R. dexter*, as well as the established features in the in situ topography of arterial branches are significant morphological contributions. The accumulated data and the conclusions of such morphometric and histochemical analyzes expand the knowledge of the structure and topography of the studied components of the gallbladder, which could be useful as basic reference values for various experiments and in some veterinary therapeutic approaches.

Another large group of contributions is related to morphometric, histochemical and immunohistochemical studies on mast cells and nerve structures in various organs of pigs, rats and normal humans. The localization of mast cells adjacent to nerve structures suggests the existence of an interaction between the nervous and immune systems in controlling the activity of the studied organs. Light microscopic immunohistochemistry to detect tissue expression of tyrosine hydroxylase, catalyzing the biosynthesis of catecholamines, was the first to detect the presence of catecholaminergic nerves and tyrosine hydroxylase positive (TH+) in ductus hepaticus communis. The data provided for the first time on the diameter of TH+ nerves and the number of TH+ mast cells in the different layers of the studied organs by morphometric examination are also of contribution importance.

It is known that the specific localization of mast cells in different layers of the bronchi and bronchioles, as well as in the alveolar wall is evidence of the ability of mast cells to actively migrate through lung tissue. A contribution from the candidate's experimental development in this regard is the confirmation of the role of these cells as one of the main sources of serotonin in lung tissue and the idea of them as cells that maintain homeostasis.

Another group of immunohistochemical studies of associate professor Ivaylo Stefanov on mast cells in human lung diseases clarify that there are convincing data on the involvement of mast cells and ghrelin in the development of respiratory distress syndrome (RDS), also known as hyaline membrane disease (HMD). Thus, in patients with RDS + pneumonia, the amount of tryptase and ghrelin positive mast cells in the bronchioles is higher than in patients with RDS alone. The explanation that the pathogen induces mast cell activation in situ represents an important pathomorphological contribution associated with this cell population.

The results of the study of the immunohistochemical expression of ghrelin in human stomach cancer suggest another practical contribution of the candidate. Of great biomedical importance is the study with various markers for endocrine cells and subsequent micromorphometric analysis, leading to the identification of types of endocrine cells in the tumor parenchyma of the stomach of patients suffering from intestinal type of gastric cancer. The large number of ghrelin-positive endocrine cells first detected in the tumor parenchyma is most likely related to carcinogenesis, and this recorded expression is a relevant marker in the prognosis and diagnosis of gastric cancer patients.

Morphological changes in nerve structures and mast cells in acupuncture (at acupuncture point ST36 in rats) are a medical contribution of real practical importance. Acupuncture has been shown to stimulate mast cell degranulation, so they are more likely to be involved in initiating signals to stimulate peripheral nerves through isolated mediators.

All of the above shows the clear research activity of Associate Professor Ivaylo Stefanov in the last 5 years, which has resulted in the publication of most of the articles with which he applied for the competition. This activity of the candidate is evenly distributed during the period. Again during this period a monograph of associate professor Stefanov was presented for participation in the competition. It

should be emphasized that the original scientific developments and the results achieved are directly related to current research trends in morphological science and biomedicine in general.

#### **IV. Overall conformity assessment**

The research output of Associate Professor Ivaylo Stefanov, as well as his previous teaching activities, fully meet the mandatory conditions and quantitative criteria for scientometric indicators according to in LDAS of Bulgaria, the Regulations for its implementation and the Regulations for academic positions at Bourgas University "Prof. Dr. Assen Zlatarov.

#### **V. Conclusion**

This application fully meets the mandatory and specific conditions and scientometric criteria for participation in a competition and for holding the academic position of "professor". Based on the materials presented to me in the competition, I find that the candidate associate professor Dr. Ivaylo Stefanov Stefanov, MD, is an established scientist, specialist with significant original fundamental and applied scientific results and contributions, some of which, despite their theoretical significance, have potential for practical application in the screening of pathological changes in the body. Some of them contribute to a more detailed understanding and teaching of both the normal morphology of some anatomical structures and pathogenetic processes.

The scientific production of Associate Professor Stefanov is of sufficient volume and quality. The candidate has worked in important morphological fields in the field of anatomy, histology, cytology and embryology. The precision in the teaching activity and in the implementation of approved research projects, as well as the presence of a doctoral student who defended thesis, demonstrate the purposefulness of the candidate.

I believe that Associate Professor Dr. Ivaylo Stefanov Stefanov, DVM, fully meets the requirements of the relevant regulations for holding the academic position of "Professor" in "Anatomy, Histology and Cytology". The minimum national indicators for academic growth specified in the Law of the Republic of Bulgaria and its Regulations have been met, as well as all conditions and procedure specificity for acquiring scientific degrees at the University "Prof. Dr. Assen Zlatarov ", Bourgas. I believe that his professional qualities and long-term achievements make him a successful leading researcher and leader of research teams, lecturer and research supervisor of PhD students now and in the future.

I strongly recommend to the esteemed Scientific Jury to vote positively for the proposal to the Academic Council of the University "Prof. Dr. Assen Zlatarov ", Bourgas, Associate Professor Dr. Ivaylo Stefanov Stefanov, Ph.D., to be elected to the academic position of "Professor" in the scientific specialty "Anatomy, Histology and Cytology ".

Prepared the review:

Signature:

December 2, 2021

Prof. Dr. Dimitar Kadiysky, MD, PhD, DSci