

БЪЛГАРСКА АКАДЕМИЯ НА НАУКИТЕ  
И-Т ПО ЕКСПЕРИМЕНТАЛНА МОРФОЛОГИЯ,  
ПАТОЛОГИЯ И АНТРОПОЛОГИЯ С МУЗЕЙ  
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## OPINION

**By Prof. Mary Liubenova Gantcheva, MD, PhD**

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Member of the Scientific Jury appointed by RD - 09/10.13.2021 of the Director of IEMPAM -  
BAS, Sofia

**Subject:** Competition for an academic position "Associate Professor" in the field of higher education 4.3. Biological sciences, professional field 01.06.26 "Morphology" for the needs of the section "Experimental Morphology", IEMPAM- BAS, announced in the SG issue no. 16/23.02.2021.

The only candidate for this competition is Assistant Professor Ekaterina Hristova Pavlova, PhD from section "Experimental Morphology", IEMPAM-BAS, Sofia. She submitted the full compliance with the required documents, according to the Regulations for development of the academic staff at IEMPAM-BAS. The materials are presented on paper and electronic media.

The Assistant Professor Ekaterina Pavlova, PhD was born on April 17, 1979. She is married and has two children. She graduated at Sofia University "St. Kliment Ohridski", Faculty of Biology, Sofia in 2004 and has a master's degree of Cell Biology and Pathology.

The professional development of E. Pavlova follows all the steps of academic realization - 2004-2005 - biologist-specialist at the Institute of Experimental Morphology and Anthropology with Museum - BAS, Sofia, 2006 - 2010 - PhD student at the Institute of Experimental Morphology and Anthropology with Museum - BAS, Sofia, 2011-2014 - Assistant and from 2014 to the present – Assistant Professor in the Department of "Experimental morphology" at IEMPAM - BAS, Sofia. Her research work is in the field of hormonal regulation of the testis.

In 2014 the candidate was successfully awarded the educational and scientific degree "Doctor" (PhD) in the professional field of "Morphology" 01.06.26 on the topic: "Morpho-functional characteristics of estrogenic action on mammalian spermatogenesis".

The entire scientific career of E. Pavlova includes 54 scientific publications, 18 of which are for the participation in the current competition for the academic position of Associate Professor, 1 extended abstract and 8 abstracts in journals with impact factor. 19 of the publications and 8 of the abstracts have an impact factor. She is first author of 19 of the scientific papers. E. Pavlova participated in 113 scientific forums - 22 oral presentations at international conferences, 17 at Bulgarian conferences with international participation and 16 at Bulgarian forums. Always well prepared, she impresses with the accuracy of her speech and skillful interpretation of the presented results.

E. Pavlova's main scientific interests are on the fields of experimental morphology, toxicology and biochemistry. She investigated the influence of various environmental factors on morpho-functional aspects of spermatogenesis, neuromorphology and hematopoiesis in experimental *in vivo* models.

The main contributions of scientifically applied nature in the scientific work of assistant professor Ekaterina Pavlova developed the original experimental approaches that make it possible to identify specific changes in testicular cell populations and to identify biomarkers for endocrine and metabolic disorders. With the application of knockout models, new horizons are opened for studying the role of key factors in the regulation of spermatogenesis.

Scientific contributions included in the PhD Thesis of E. Pavlova are data on the particular sensitivity of different germ cell types to neonatal estrogen action and the need of estrogen-androgen balance for the normal proceeding of spermatogenesis. After hormonal manipulation the decrease of spermatocyte count is accompanied by an opposite model of retinoid and androgen signaling in Sertoli cells (publ. 19, 20, 21, 22, 23, 24, 25, 26, 44).

Experimental modulation of the amounts of DMA (a widely used solvent in the pharmaceutical industry) allows finding the appropriate dose for a male contraception. Data on reproductive capacity, hormonal profiles and fertility, which are fully restored within two months, open the possibility of its use as a non-hormonal and safe male contraceptive (publ. 16, 17).

A study of the effect of lead and cadmium ions and their chelating agents as a potential use as antidotes against heavy metal intoxication revealed a potential use of monensin, salinomycin and deferiprone as antidotes in such cases (publ. 13, 38, 49, 51).

In the field of functional neuromorphology, changes in the expression of angiotensin II receptor, type 1 (AT1 receptor) in limbic structures of the brain, as well the effect of the AT1 receptor antagonist losartan in a model of comorbid hypertension and epilepsy in rats were studied. The results provide evidence that losartan could be used as a therapeutic strategy for treatment of comorbid hypertension and epilepsy (publ. 4).

New data on the effect of cobalt on brain structure and changes in key protein expression were received from mouse experimental model of hypoxia, induced by treatment with cobalt dichloride. The results contribute to the elucidation of the neurotoxic potential of cobalt and the related health risks in newborns and infants (publ. 5, 53).

Sodium and cobalt salts were studied. They are used as dietary supplements in the clinic and in sport medicine to improve the performance of athletes due to the fact that they cause hypoxia and therefore have a stimulating effect on erythropoiesis (publ. 14, 34; abstr. 2). A number of articles have contributed to understanding the side effects of chronic cobalt intake in the form of a dietary supplement or included in the composition of joint implants (publ. 5, 8, 12, 18, 28, 32, 33, 35, 41, 43, 50, 53, 54).

Contributions of a scientific-theoretical field are the described changes in the androgen receptors after androgen deficiency, including their loss and recovery in Sertoli cells paralleled with degenerative and regenerative events in Leydig and germ cell populations, confirming close functional relationship between Sertoli, Leydig and germ cells (publ. 3, 26; abstr. 1). Interesting are studies on metabolic disorders as a risk factor for male infertility, using experimental models to induce diabetes or using a high-fat diet. The obtained original data support the understanding of the mechanisms of metabolic disorders, germ and Leydig cell development and Leydig cell steroidogenic function (publ. 40, 46, 53; res. 7). Administration of the testicular angiotensin-converting enzyme contribute to the good assessment of delay of the first spermatogenic wave, the loss and recovery of the elongated spermatids. These original data provide a new insight into its role as a marker of spermatid elongation (publ. 9, 40, 45, 52).

Original *in vivo* experimental models for subacute, acute and chronic treatments with salts of sodium and heavy metals - cobalt, lead and cadmium were developed. Their effects on spermatogenesis and reproductive capacity were studied. A direct mechanism of cobalt action on reproduction (other than its hypoxic effect) is assumed (publ. 2, 30, 31, 39). Other studies show that a lack of oxygen in the testes affects reproductive capacity. (publ. 1, 36, 37, 47).

Assessment of the candidate's scientometric indicators: 114 citations on 16 publications, as 34 of them are in the SCOPUS database. Total impact factor (IF) of the publications is 43.708, individual IF – 6.587, total IF of the abstracts – 18.585, individual IF – 3.656. The candidate shows an impressive total IF - 62.293 and a combined individual IF - 10.244.

Assistant Professor E. Pavlova has an enviable and successful participation in 16 research projects. She is a project leader of 2 of them. 6 of the projects are international, 1 is funded by the 7<sup>th</sup> Framework Program of the European Union, the other 3 are funded by the Operational Program "Development of Human Resources". E. Pavlova participated in 3 national and 2 bilateral projects funded by the National Science fund of the Ministry of Education and Science and 5 projects funded by the NSF of Sofia University "St. Kliment Ohridski". E. Pavlova's work is characterized by energy, enthusiasm and analytical thinking, leading to the large number of publications and scientific communications that she shares with the academic community.

Assistant Professor E. Pavlova is a member of the Bulgarian Anatomical Society (BAA), Network for Young Researchers in Andrology (NYRA), International Society of Andrology (ISA), International Federation of Associations of Anatomists (IFAA) and European Federation of Experimental Morphology (EFEM).

I have known E. Pavlova since 2007. She has always been distinguished by high professionalism, correctness, intelligence, excellent communication and successful teamwork. She is a proven researcher and an ambitious young scientist.

Based on the general description of the submitted materials and on the basis of the shown scientific contributions and scientific results, I give a positive assessment, and I believe that Assistant Professor E. Pavlova meets the requirements for holding the academic position of "Associate Professor" at the Department of "Experimental Morphology", IEMPAM - BAS, Sofia. Therefore I strongly recommend the esteemed members of the Scientific Jury to support the positive vote.

05.06.2021

  
Prof. Mary Gantcheva, MD, PhD