

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

Вх. № 278
..... 23. 11 2021 а.

СОФИЯ

OPINION

by Professor Dr. Rumiana Dimitrova Tzoneva, Institute of Biophysics and Biomedical Engineering, BAS

regarding a competition for "Associate Professor" in a professional field 4.3. Biological Sciences, scientific specialty "Virology", code 01.06.13, published in the State Gazette, issue 57 of 16. 07. 2021, for the needs of the section "Pathology", IEMPAM - BAS.

Assistant Professor Dr. Ani Krasimirova Georgieva is the only candidate in the announced competition. The documents provided by the candidate for holding the academic position "Associate Professor" are prepared in accordance with the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation.

Ani Krasimirova Georgieva graduated from Sofia University "St. Kliment Ohridski", Faculty of Biology in 2000, in speciality in Molecular Biology and specialization: Animal and Human Physiology. In 2014 he successfully defended his doctoral dissertation on the topic „*IN VITRO* and *IN OVO* models of chemical and retrovirus-induced cancerogenesis», with supervisor Assoc. Prof. Dr. Ivan Ivanov at IEMPAM - BAS.

After obtaining the scientific and educational degree "Doctor" in Virology, Dr. Ani Georgieva was appointed as a senior assistant at the same Institute, where she still works.

In the current competition, Assistant Professor Dr. Ani Georgieva participated with 35 publications outside the publications included in the doctoral dissertation. Of these, 21 articles have been published in international journals with an impact factor. In six of the articles Ani Georgieva is the first author. The above papers have 93 citations in international journals, and the results of scientific research have been reported at 74 international and national scientific forums. So far, Dr. Georgieva has a total of 37 publications in SCOPUS, which have been cited 123 times without auto-citations of all authors (h-index = 6 - according to SCOPUS).

The research activity of Assistant Professor Dr. Ani Georgieva is in the field of virology, oncovirology and experimental oncology. The research is aimed at developing new approaches and strategies for prevention and treatment of cancer, as well as to clarify the factors and mechanisms responsible for their occurrence. In the study of the effectiveness of natural products, newly synthesized chemical compounds and new nanostructured materials with potential application in the treatment of neoplastic and virus-induced diseases, a complex approach is applied, including *in vitro*, *in ovo* and *in vivo* model systems.

Its contributions fall into three main areas:

1. Field of virology

They are conducted molecular biological tests for detection and identification, as well as phylogenetic analysis of six of the most common viruses in honey bees in samples from different regions of the country: (*Apis Mellifera* (Deformed wing virus (DWV); Acute bee paralysis virus

(ABPV); Chronic bee paralysis virus (CBPV); Sacbrood virus (SBV); Kashmir bee virus (KBV); Black queen cell virus (BQCV). Publications № 19, 20 and 22.

2. Field of oncovirology

A permanent cell line was obtained from an experimental virus-induced Graffi myeloid tumor in a hamster (inoculation of hamsters with murine leukemic retrovirus of Graffi). The experimental tumor model has established itself as an appropriate model system for studying and evaluating the antitumor activity of various natural and synthetic substances and preparations. The development and use of this new *in vitro* model system reduces the need to use experimental animals in research. Publications № 12, 24 and 27.

3. Field of experimental oncology

a. cytotoxicity, genotoxicity and carcinogenicity

- The cytotoxic, genotoxic and carcinogenic potential of the fungicide mancozeb in experimental model systems alternative to experimental animals was studied. The results obtained contribute to the assessment of the potential risks to human and animal health exposed to this fungicide. Publications № 6 and 7.
- The cytotoxic effect of the mycotoxin fumonisin B1 in cell cultures of embryonic and avian and mammalian cells has been studied. The obtained experimental data serve to elucidate the mechanisms of cytotoxicity of the mycotoxin fumonisin B1. Publications № 11 and 36.
- The cytotoxicity, genotoxicity and carcinogenicity of newly synthesized anthracene-containing α -aminophosphonates and their derivatives were studied. The results obtained indicate the above compounds as suitable candidates for use in medicine and pharmacy. Publications № 8, 9, 10 and 29.

b. Antitumor activity

- In studying the antitumor activity of newly synthesized anthracene-containing α -aminophosphonates and their derivatives on a panel of human tumor cell lines (HeLa - cervical adenocarcinoma; HT-29 - colorectal adenocarcinoma; MCF-7 and MDA-MB-321 - low invasive and high invasive mammary adenocarcinoma; HepG2 - hepatocellular carcinoma; 647-V - bladder carcinoma) and in the Ehrlich carcinoma cell line in mice, a strong cytotoxic and antiproliferative effect was observed. The results obtained indicate the potential of anthracene-containing α -aminophosphonates in the treatment of cancer. Publications № 8, 9, 10, 13 and 29.
- In an *in vitro* and *in vivo* model study of the antitumor activity of alkylphosphocholine Erufosine, it was found that it inhibits the proliferation of Graffi tumor cells, causes reorganization of the cytoskeleton and apoptosis.

The results of the *in vivo* study show a protective antitumor effect of Erufosine administered alone or in combination with the conventional cytostatic Doxorubicin in hamsters with experimental Graffi's myeloid tumor. The obtained experimental data reveal Erufosine as a promising antitumor agent for use in antitumor therapy both alone and in combination with conventional cytostatics with increased efficacy and reduced side effects. Publications № 12 and 25.

- The antitumor properties of nanostructured electrospun polymeric materials and loaded with biologically active substances of natural origin (curcumin, ferulic acid, caffeic acid) on cervical tumor cells were studied. The obtained results show that the tested materials can be suitable carriers of various anti-tumor substances. Publications № 14, 16 and 17.
- The antitumor properties of established and widely used in practice non-steroidal anti-inflammatory drugs have been studied and elucidating some mechanisms of action on human cancer cells in *in vitro* experiments. The established antiproliferative and proapoptotic properties of non-steroidal anti-inflammatory drugs testify to their potential in the treatment of human cancer. Publications № 18 and 26.
- The *in vitro* antitumor activity of hemocyanins isolated from sea snail *Rapana venosa*, garden snails *Helix lucorum* and *Helix aspersa*, as well as mucus from *Helix aspersa* was studied. The resulting significant antineoplastic activity of hemocyanins and mucus from *Helix aspersa* testifies to their potential in the development of new therapeutic agents for the treatment of colorectal cancer. Publication №23

The contributions of scientific and applied significance of Assistant Professor Ani Georgieva are involved in the development and application of new experimental models and research methods in the field of virology and experimental oncology such as:

- Successfully introduced and applied *in ovo* model systems, as an alternative to experimental animals, for research in the field of virology and tumor biology. Publications № 7, 15, 30, 34, 35, 37 and 38.
- Maintenance and enrichment of the collection of cell and tissue cultures of IEMPAM-BAS, including obtaining primary cultures and permanent cell lines from tumor and embryonic tissues of different classes of organisms (birds and mammals).
- Introduction and application of an innovative approach for molecular - biological detection and identification of viruses in honey bees with a contribution to solving agricultural, economic and environmental problems related to the increase of morbidity and mortality in bee colonies in Bulgaria.

Dr. Ani Georgieva has participated in the implementation of 14 research projects (10 - funded by FNI, 2 - under contracts with higher education institutions in the country and 2 under European programs).

Dr. Georgieva has participated in the training of graduates from higher education institutions in the country and abroad.

Conclusion: From the presented scientific works of Assistant Professor. Dr. Ani Georgieva shows that the overall scientific output of the candidate fully satisfies and even exceeds the requirements of the Law on Academic Development in the Republic of Bulgaria and the criteria for acquiring the scientific title "Associate Professor" at IEMPAM - BAS for professional field "Biological Sciences", scientific specialty "Virology".

These scientific contributions have both fundamental and scientific-applied significance for the development of virology, oncovirology and experimental oncology.

My personal impressions of Ani Georgieva are of a very diligent and profound scientist.

Taking into account all the above, I will confidently vote positively in the scientific jury for the award of Dr. Ani Georgieva to the scientific title "Associate Professor".



Prof. Dr. Rumiana Tzoneva

23.11.2021 r.

Sofia