

## OPINION

**FROM:** Prof. Dr. Penka Angelova Moncheva, member of the Scientific Jury, appointed by order RD - 38 - 543 / 18.09.2023 of the Rector of SU "St. Kliment Ohridski", Prof. DSc Anastas Gerdzhirov

**REGARDING:** The materials submitted for participation in a competition for the academic position "Associate Professor" at Sofia University "St. Kliment Ohridski" in the field of higher education 4. Natural sciences, mathematics and informatics; professional field 4.3. Biological Sciences, Virology - Molecular Virology

The competition for the academic position "Associate Professor" in the area of higher education 4. Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences, Virology - Molecular Virology has been announced for the needs of the Laboratory of "Virology" of the Faculty of Biology at SU "St. Kl. Ohridski" in SG № 65/28.07.2023. In the period regulated by law, Assistant professor Dr. Kalina August Shishkova from the Faculty of Biology at SU is the only applicant that submitted document for this competition. She works on a permanent employment contract in the same laboratory.

### 1. General presentation of the procedure and the candidate

The submitted materials for participation in the competition have been prepared in accordance with the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the act and the Regulations on the Terms and Procedures for Acquiring Scientific Degrees and Holding Academic Positions at SU "St. Kl. Ohridski. The competition documentation is structured according to the requirements and allows to follow the overall academic activity of the candidate - teaching-pedagogical, scientific and scientific-applied and administrative activities according to qualitative and quantitative indicators.

Assistant professor Dr. Kalina Shishkova completed her higher education in the Faculty of Biology at SU "St. Kl. Ohridski", where she graduated with a master's degree in "Molecular Biology" in 1997. In 2014, she obtained the educational and scientific degree "doctor" after successfully defending dissertation on the topic "Distribution and genetic diversity of *Torque teno* viruses (*Anelloviridae*) in Bulgaria" in the Faculty of Biology at SU "St. Kl. Ohridski". Dr. Shishkova held the following positions after completing her higher education: 1997-2002 - specialist-virologist at the Institute of Microbiology - BAS; 2002-2004 - part-time assistant in the Faculty of Biology at SU "St. Kl. Ohridski"; 2004-2010 - assistant in the Laboratory "Virology" in the Faculty of Biology at SU; 2010-2011 - senior assistant; 2011 - until now – assistant professor in the same laboratory.

The general scientific production of Dr. Shishkova is described by 33 works with a total IF= 33.169, SJR= 9.485, h-index 6 (Scopus). The distribution of her works is as follows: doctoral thesis abstract – 1; scientific articles published in refereed scientific journals, indexed in world-famous databases with scientific information – 22; articles published in journals without impact factor/impact rank – 5; articles printed in full text in proceedings of international scientific forums - 5. According to the scientific database Scopus/Web of Science, the presented works have been cited 143 times. Forty eight (48) announcements in scientific forums were also presented (in international forums - 31 and in national - 17), of which 24 sectional and plenary reports and 24 posters.

In the competition for the academic position "Associate Professor", Dr. Shishkova presented 21 scientific works, all of which were published in refereed scientific journals, indexed in world-famous databases with scientific information, distributed by quartiles as follows: Q1 – 4; Q2 – 6; Q3 – 6; and Q4 - 5. Among the publishing journals I would mention *Frontiers in Plant Science* (IF 6.627), *Viruses* (IF 5.818), *Antiviral Research* (IF 4.301), *Amino acids* (IF 3.877), *Phytochemistry Reviews* (IF 2.894), *Crystals* (IF 2.67), and *Carbohydrate Research* (IF 2.025).

Dr. Shishkova is co-author of Manual for Practical Classes in Virology, University Publishing House of SU "St. Kl. Ohridski" (ISBN 9789540747354).

Assist. Prof. Shishkova participated as a member of the working team in 20 scientific projects (6 funded by the Ministry of Education and Science, 1 - by the Ministry of Regional Development and Public Works, and 13 - by the "Scientific Research" Fund of SU "St. Kl. Ohridski"). These projects are thematically related to the current competition and reflect her scientific and scientific-applied activities.

## 2. General evaluation of the candidate's activity

### 2.1. Assessment of educational and pedagogical activity

The educational and pedagogical activities of Dr. Kalina Shishkova, started in 2002 as a part-time assistant in the Faculty of Biology at SU "St. Kl. Ohridski". At the moment, in Educational and Qualification Degree (EQD) "Bachelor" she gives lectures and conducts exercises in Virology and educational practices in Molecular Virology, Virology, and Microbiology and Virology. In EQD "Master" she gives lectures on the disciplines Antiviral Immunity and Phages and Lysogeny.

Her academic employment for the last 5 years (2017-2022) amounts to 3181.5 hours, of which 1802.9 classroom hours. Its average annual academic employment for this period is 636.3, of which 360.58 classroom hours, which significantly exceeds the norm of 360 hours of total academic employment.

Dr. Shishkova is the academic supervisor of 9 graduates who have successfully defended their diplomas - 7 in the Master's degree, and 2 in the Bachelor's degree.

I believe that Dr. Shishkova's 20-year teaching experience and her serious academic work are proof that she is an established university teacher in the field of virology.

### 2.2. Evaluation of the scientific and scientific-applied activity

#### *Scientific works*

The report on the fulfillment of the minimum national requirements under Art. 2b of the ADASRB for scientific area 4. Natural sciences, mathematics and informatics; professional field 4.3. Biological Sciences shows that Assist. Prof. Dr. Shishkova completely covers and even exceeds these criteria (the citations are much more than indicated in the table), as follows:

Group of indicators	Contents	Requirements for the academic position „Associate Professor“	Fulfillment by the candidate
A	Indicator 1	50	50
V	Indicator 4	100	100
G	Indicator 7	200	258
D	Sum of points in indicator 11	50	60
Total		<b>400</b>	<b>468</b>

#### *Scientific and scientific-applied contributions*

Dr. Shishkova's research work covers several scientific directions in the field of virology, which could be defined as follows: **I.** Screening of natural products for antiviral activity; **II.** Investigation of new synthetic compounds for the presence of an antiviral effect; **III.** Medical virology; **IV.** Investigation of the antiherpetic effect of physical factors.

Her research with the obtained results contains scientific and scientific-applied contributions in the indicated scientific directions, well formulated by Dr. Shishkova. I will summarize those that I consider most significant.

- ✓ A contribution to the search for new antivirals and to the approaches to their treatment are the results obtained from the screening of a large number of extracts, their fractions and active substances isolated from various natural sources (plants, invertebrates and microorganisms) for the presence of inhibitory and inactivating activity against a range of strains of *Herpes simplex virus* type 1 and type 2 and an acyclovir resistant strain. Based on this, results have been obtained supplementing the currently known medicinal properties of these plants, revealing the possibility

of developing standardized extracts of some of them (*Astragalus glycyphyllos*) in the form of tablets and their potential for adjuvant application in further research (publications 4, 5, 7, 8, 9, 11, 17, 18).

- ✓ The contribution is the results of the study of the antiherpetic activity of extracts isolated from *in vitro* grown plants, which are species protected by the Act of Biological Diversity and which are of interest from a medical point of view (publications 6, 16).
- ✓ For the first time, the antiviral effect of hemocyanins (as whole molecules, as well as structural and functional subunits) isolated from the Black Sea rapana and representatives of the genus *Mollusca*, *Eriphia verrucosa*, mucus from *Helix aspersa*, and structural subunit of *H. aspersa* hemocyanin to VHS-1 replication was established (publ. 2, 14).
- ✓ When studying the antiherpetic activity of metabolites from lactic acid bacteria isolated from fermented products, a strong activity against HHV-2 with a selective index above 45 was found. These results are a prerequisite for further research (publ. 14).
- ✓ Contributing to approaches to controlling viral infections through the directed synthesis of new substances are the results of the *in vitro* study of the biological activity of new hydroxycinnamic acid amides of a thiazole containing TFA, ethyl ester of valine-4-carboxylic acid with respect to the replication of influenza virus A (H3N2) and human herpes virus 1 and 2 (publ. 1).
- ✓ The *in vitro* antiviral activity against herpes simplex virus type 1 and type 2 replication of newly synthesized acyclovir esters with peptidomimetics was evaluated, and the effect of peptidomimetics containing oxazole and thiazolyl-thiazole moieties on this activity was reported (publ. 3).
- ✓ Based on *in vitro* evaluation of the efficacy of some analogs of the ion channel inhibitors amantadine and rimantadine against human coronavirus 229E (HCoV-229E), more promising results were obtained for two of the derivative compounds, showing good affinity for binding, the molecular structure of which was investigated by single-crystal X-ray analysis (publ. 21).
- ✓ For the first time in Bulgaria, *Torque Teno* viruses were demonstrated by adapting different primer systems (publ. 15).
- ✓ A statistically significant association was found between the presence of periodontitis-causing bacteria and high-risk strains of HPV (publ. 20).

Based on the analysis of the scientific research activity of Assist. Prof. Shishkova, I positively assess her scientific works, both quantitatively and qualitatively, many of which have been published in journals with a high impact factor and have received recognition from the international scientific community through the noted citations. The results of the research are contributions to the scientific directions in her research activity. Dr. Shishkova has an impressive participation in scientific projects.

### **2.3. Assessment of administrative activity**

Assist. Prof. Shishkova is a long-time secretary of the Master program Virology (from 2009 to the present). Since 2020, she has been a member of the Quality Commission of the Faculty of Biology at SU "St. Kl. Ohridski".

### **3. Evaluation of the candidate's personal contribution**

The documentation presented by Dr. Shishkova, together with the attached scientific works prove her personal contribution to their experimental development, the analysis of the obtained results, the interpretation and the definition of the main scientific and scientific-applied contributions, which are well presented. The scientific works are collective, but in each of them the personal contribution of Assit. Prof. Shishkova is clearly distinguishable.

#### **4. Critical notes and recommendations**

I have no comments or recommendations regarding the materials and documentation presented by Dr. Shishkova for participation in the competition for the academic position of "Associate Professor".

#### **5. Conclusion**

The documents and materials presented by Assist. Prof. Dr. Kalina Shishkova, to participate in the competition for the academic position of "Associate Professor", meet all the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for its Implementation and the Rules for the Conditions and Procedures for Acquiring scientific degrees and occupation of academic positions at SU St. "Kl. Ohridski".

The candidate in the competition has presented a sufficient number of scientific works and convincing evidence of her scientific, scientific-applied and teaching work, which show a high quality of her overall academic activity. All this allows me to confirm my positive assessment given in the analysis of all aspects of the candidate's academic activity and to confidently recommend to the respected scientific jury formed by order № RD – 38 – 543 / 18.09.2023 of the rector of SU "St. Kl. Ohridski" to prepare a report-proposal to the Faculty council of the Faculty of Biology at SU "St. Kl. Ohridski" for the election of Assist. Prof. Dr. Kalina August Shishkova, in the academic position of "Associate Professor" in the area of higher education 4. Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences (Virology-Molecular Virology).

05.11. 2023  
Sofia

Prepared the opinion:  
(Prof. Dr. Penka Moncheva)