ATTENTION: THE MEMBERS

OF THE SCIENTIFIC JURY /SJ/, APPOINTED

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COMPETITION FOR THE ACADEMIC

POSITION "PROFESSOR" IN THE NCZPB, ISSUED

BY THE DIRECTOR OF THE NCZPB, SOFIA

R E V I E W

On the scientific production of Assoc. Prof. Ivaylo Aleksiev Ivanov, PhD, Head of the HIV Research Laboratory and Head of the Virology Department at the National Center for Infectious and Parasitic Diseases in connection with the competition announced in the State Gazette – 113, p. 225 of 03.03.2026 for the academic position of "Professor", for the needs of the Virology Department of the National Center forr Infectious and Parasitic Diseases . Sofia

by Prof. Dr. Radka Mladenova Argirova, Virologist, Clinical Laboratory, Tokuda University Hospital, Sofia

RESPECTED MEMBERS OF THE SCIENTIFIC JURY,

Assoc. Prof. Ivaylo Aleksiev graduated from the Faculty of Biology of Sofia University "St. Kliment Ohridski" in 1994. He started working in the HIV Research and Development Center at the National Center for Infectious and Parasitic Diseases in 2003, and in 2008 he acquired a specialty in "Clinical Virology". From 2008 to 2011 he was a doctoral student at the same National Center , and in 2011 he acquired the "Doctor" degree after successfully defending his dissertation. Since 2014 he has been an associate professor, since 2016 - head of the HIV Research and Development Center, and since 2024 - head of the Virology Department at the National Center for Infectious and Parasitic Diseases.

From 2006 to 2018, the candidate participated in 6 specialization courses mainly in the field of sequencing, bioinformatics and similar aspects of HIV molecular biology in a number of global and European centers, among which the most notable is the Fulbright scholarship he won and successfully implemented as a visiting researcher at the University of Florida, USA (5 months), the training in phylogenetics and NGS, CDC, Atlanta, USA (2 months) in 2013, the 2-week training in sequencing and analysis of resistance mutations in HIV at the Luxembourg Institute of Health and 4 short-term trainings in Italy, Greece and Egypt. At the end of 2025, the candidate successfully defended a dissertation titled: "Antiretroviral resistance and molecular epidemiology of HIV-1 in Bulgaria: integrated analysis of genetic diversity, phylodynamics and demographic correlations" and acquanted the scientific degree "Doctor of Sciences".

In the announced competition, Assoc. Prof. Ivaylo Aleksiev is the only candidate.

The research activities of Assoc. Prof. Ivaylo Aleksiev, according to himself, can be focused in the following areas: (1) molecular epidemiology and antiretroviral resistance of HIV-1; (2) co-infections in people living with HIV; (3) genomic epidemiology of SARS-CoV-2 and other respiratory viruses; and (4) molecular diagnostics of viral infections and other pathogens.

The basis of this scientific production lies in many years of scientific research and diagnostic activity in the confirmatory diagnostics of HIV infection with the mastery and use of all modern molecular biological methods, as well as the bioinformatics of an HIV model, including sequencing and analysis of resistant mutations in HIV, arising during antiretroviral therapy (ART). We remind you that the WHO has not yet canceled the HIV/AIDS pandemic and even in this sense alone, the entire scientific research activity of the candidate, at all stages, is relevant.

The molecular epidemiology of HIV-1 in Bulgaria includes systematic analyses of the genetic diversity of the virus, the evolutionary dynamics of different subtypes, phylogeographic reconstructions, the study of transmission clusters and networks, as well as molecular characterization of antiretroviral drug resistance. These studies have been implemented on the most extensive and long-term maintained molecular epidemiological database for HIV-1 in Bulgaria, including the analysis of over 1650 pol sequences, covering a period of 35 years (1989–2023). This unique dataset represents a scientific resource of exceptional national and regional importance.

HBV and HCV coinfections in people living with HIV include molecular characterization of the transmission of both viruses in this population. The results obtained contribute significantly to the understanding of the co-morbidity of HIV infection and have direct application in clinical practice, public health and necessary prevention.

The virologist and bioinformatician Ivaylo Aleksiev is not indifferent to the evolution and genomic epidemiology of SARS-CoV-2. In this area, his research includes systematic sequencing and phylogenetic analysis of circulating viral variants in Bulgaria. The introduction, spread and replacement of the Alpha, Delta and Omicron variants, as well as recombinant forms, have been documented, post-vaccination infections, co-infections with other pathogens have been analyzed, and international comparative studies related to global genomic surveillance have been carried out. These studies, carried out in the context of the COVID-19 pandemic, represent a significant contribution to the understanding of national specificities in the context of the global process of monitoring the SARS-CoV-2 virus. In addition to the pandemic agent, Assoc. Prof. Alexiev has worked and assisted with the diagnostics of other viruses – influenza, RSV, etc.

By their very nature, first of all, the conclusions from applied research, especially in the field of HIV bioinformatics, are important and necessary both at the individual and population level, as they directly show the dynamics of the HIV-1 epidemic in Bulgaria - the spread of the virus - geographically and among individual communities, target groups and the interaction between them. On the other hand, molecular virological analyses enrich our knowledge about the evolution of HIV-1 at the local and global level. Their conclusions are convincing and up-to-date, and their publication in the most reputable journals confirms their importance.

A special place in the work of Assoc. Prof. Alexiev is occupied by the HIVDB Resistance Assessment System, which takes into account five different levels of drug resistance, described and used by the author in his doctoral dissertation. A classification of resistant mutations is shown, as well as their relationship to individual classes of ART. The conclusions from the resistance assessment also have invaluable practical significance.

The molecular-virological analysis of the transmission clusters of the introduced and widespread HIV-1 subtypes in Bulgaria is the crown and unifying link of all previous studies. The data show that at the beginning of the epidemic the sources of the virus were mainly in the country, and not imported from outside - 88.4% of the individuals from the first group declared infection in the country. This conclusion contradicts claims from the beginning of the epidemic that HIV was mainly imported to our country from outside. The characteristics of the individual clusters and the spread of the virus within them are comprehensive, informative and of a confirmatory nature. The detective work uncovering active HIV-1 transmission networks with a predominance of MSM-MSM connections and significant interpopulation MSM-HET connections provides food for thought and the need for specific targeting of epidemiological surveillance.

Regarding antiretroviral resistance – a particularly interesting conclusion is that a controlled epidemic of transmission resistance with a frequency of 5.7% in 1053 untreated patients has been documented, corresponding to the WHO criteria for successful epidemiological control. This is a very good attestation for both the laboratory and the treatment unit at the Infectious Diseases Hospital.

Here we should also note the specialized monograph of the candidate HIV ANTIRETROVIRAL DRUGS AND RESISTANT MUTATIONS, 2024, which describes in great detail the experience of the author and the HIV NPL on antiretroviral resistance.

Shortly, Assoc. Prof. Alexiev's scientific research shows the multifaceted, complex and unique diversity of the Bulgarian HIV epidemic, closely related to the geographical crossroads at which the country is located, as well as the serious contribution that the "small" epidemic can make to the global spread and evolution of the virus.

I fully agree with the contributions of Assoc. Prof. Alexiev, identified by him in the author's reference. I especially emphasize the stable, long-term scientific cooperation with a number of leading European countries and the USA, which is clearly visible in the collectives of his publications.

Ivaylo Alexiev is an experimenter, analyst and organizer – with a clearly outlined sequence in the goals of his research, specific conclusions of a fundamental scientific nature, leading to the next experiments. In Alexiev's intensive scientific life and activity, each publication gives rise to a new perspective, his works are complete in nature, but the new challenge lurking behind each of them predetermines his and the laboratory's activity as if endless and ever more profound. The perspective of his research always marks the potential for possible practical application and practical benefit for the individual and for public health.

The publication activity of Ivaylo Alexiev is remarkable. For the purposes of acquiring the academic title of "professor" Ivaylo Alexiev applied 41 scientific articles in peer-reviewed international journals with a total impact factor of 172.9. I specially note that they do not repeat the articles submitted for acquiring the educational and scientific degree "doctor", the scientific

degree "doctor of sciences" and for occupying the academic position "associate professor". A list containing 16 articles without an impact factor, 201 presentations abroad, head of 4 scientific projects funded by the National Science Foundation /one of them was implemented at CDC, Atlanta, USA/, participant in 7 scientific projects - 5 with national and 2 - with international funding is also attached. Assoc. Prof. Alexiev is a sought-after colleague, collaborator and co-author. This fact is confirmed by the 475 citations in the world scientific press, and this number does not include citations in publications used in the acquisition of the ONS "Doctor", Associate Professor and Doctor of Science.

The teaching workload of Assoc. Prof. Aleksiev is 177 hours on average per year. Here we must add more facts from his teaching and teaching activities: under his supervision, 2 dissertations for the ONS "doctor" and 2 master's theses were defended. He has trained about 10 people in bioinformatics on the HIV model. He is the organizer of annual HIV Conferences, where scientific and practical experience in diagnostics, treatment and all innovations in this rapidly developing field of medicine, biology and evolution are exchanged. In total - in a number of scientific indicators - e.g. publications - Assoc. Prof. Alexiev covers and far exceeds the requirements for acquiring the academic position of "professor". In total, he has an impressive total of 2353 points against the required 450 points according to the Regulations of the NCZPB. Separately, 970 Bulgarian sequences isolated from the pol gene of HIV-1 in the NRPL on HIV have been published in GenBank to be available to the global scientific community.

Assoc. Prof. Ivaylo Alexiev has established lasting scientific international contacts with leading scientific institutes and organizations, which are often partners and co-authors in his research activities - CDC, Atlanta, USA, University of Florida, USA, Campus Bio-Medico University, Rome, Italy, Luxembourg Institute of Health, etc. His research was funded by the National Center for the Study of Biological Diversity, the Ministry of Health of the Republic of Bulgaria (project DN03/2 of 16.12.2016, Scientific Research Fund), as well as under project BG05M2OP001-1.002-0001 under the Operational Program "Science and Education for Smart Growth 2014–2020", co-financed by the European Regional Development Fund. All this shows full confidence and reliability on the part of the donors regarding the research conducted and the results obtained.

In conclusion, my comprehensive assessment of Assoc. Prof. Ivaylo Alexiev in connection with his candidacy for the academic position of "professor" presents him as a highly erudite scientific researcher in the field of fundamental virology, molecular epidemiology and bioinformatics in the field of HIV infection in the context of the Bulgarian HIV epidemic, with unique characteristics of this epidemic, published in the world's most prestigious scientific journals and databases. The candidate's works have been cited many times, he is a sought-after colleague, co-author and organizer of scientific events. All this gives me reason to vote categorically "FOR" the appointment of Assoc. Prof. Ivaylo Alexiev to the academic position of "professor" with wishes for even more successful scientific and research work. I openly call on the other members of the scientific jury to support my vote and assessment.

Sofia, 31.05.2026

REVIEWER: (s)

/Prof. DSc Radka Argirova/