

POSITION

Regarding the application of **Assoc. Prof. Lyubka Pavlova Tancheva, PhD** in the competition for the academic position **"Professor"** in the professional field 7.1 Medicine, scientific specialty *"Pharmacology"* for the needs of the *"Behavioral Neurobiology"* Department, Institute of Neurobiology, BAS - Sofia, published in the State Gazette No 10/01.02.2019, p. 165.

Assoc. Prof. Nikolay T. Tzvetkov, PhD

Head of Department ..Biochemical Pharmacology and Drug Design"
Institute of Molecular Biology „Roumen Tsanev“, Bulgarian Academy of Sciences (BAS)

General overview of the documentation and their compliance with the rules and criteria according to the Law on the Development of the Academic Staff (LDAS) of the Republic of Bulgaria and the Regulations of the Institute of Neurobiology at the Bulgarian Academy of Sciences for the academic position "Professor"

Associate Professor Lyubka Tancheva is the only candidate in the competition for the academic position "Professor" at INB-BAS, announced for the needs of "Behavioral Neurobiology" Department. The set of documents presented for the competition complies with the requirements of the LDAS of the Republic of Bulgaria and the Rules for its application. The documents are well-arranged and convincingly show that, according to the scientific degree/position, scientific experience, research, publishing, and pedagogical activity, Assoc. Prof. Lyubka Tancheva fully meets the requirements of the Rules of the Institute of Neurobiology at the Bulgarian Academy of Sciences for academic position "Professor" in the scientific specialty *"Pharmacology"* for the needs of "Behavioral Neurobiology" Department.

Education, career development, scientific, and professional experience in the scientific field "Pharmacology"

Assoc. Prof. Lyubka Tancheva has graduated at the Pharmaceutical Faculty of the Medical Academy in Sofia in 1975 as Master-Pharmacist. In 1976 she has been assigned as PhD student at the Faculty of Pharmacy of MA-Sofia. In 1982 she defended PhD thesis entitled: *"Influence of hydrocortisone and deoxycorticosterone on the activity of some drug-metabolic enzyme systems"*. After receiving his PhD title in Pharmaceutical Sciences (VAC, Faculty of Pharmacy, MA-Sofia) in 1983, Lyubka Tancheva worked consecutively at the Department of Pharmacology and Toxicology, Faculty of Pharmacy, MA Sofia (until 1987), Institute of Physiology at the Bulgarian Academy of Sciences (1988-2011), and currently at INB-BAS. Tancheva has been habilitated as Associate Professor in 2007 (VAC, Sofia) in the specialty "Pharmacology, incl. Pharmacokinetics and Chemotherapy ", professional field 7.1 Medicine.

Since 2011, Assoc. Prof. Tancheva has been working at INB-BAS, "Behavioural Neurobiology" Department, where she successfully applied his expertise and experience in the fields of neurobiology, pharmacology and toxicology. For the entire period of his career, Assoc. Prof. Tancheva has gained remarkable professional experience as a specialist in a wide range of scientific knowledge and as a leader and participant in a number of international and national research projects. In particular, Prof. Tancheva's studies are related to the examination of behavioral, psychopharmacological and toxico-biochemical effects on *in vivo* models of some of the most important diseases nowadays, such as Parkinson's disease, Alzheimer's disease, and a number of other diseases related to the processes of neurodegeneration and oxidative stress.

Specializations and work as a guest-scientist

During her scientific career Assoc. Prof. Tancheva has specialized and worked as a visiting scientist in a number of internationally recognized scientific institutions such as: 1988 - Institute of Pharmacology of the Slovak Academy of Sciences (Bratislava), 1989 - Friedrich-Schiller University (Jena, Germany), 2009 - Faraday Institute of Cambridge University (Great Britain), 2015-2016 - guest professor of Weizmann Institute of Science (WIS; Rehovot, Israel).

In 2015 Assoc. Prof. Tancheva has obtained an international grant from the Western Grant Scholarship at WIS, Israel with the scientific topic *"Social and pharmacological modulation of brain plasticity of mice with transgenic model of autism"*. The specialization and invitation as a visiting scientist in some of the leading scientific organizations in the field of neurobiology, such as the Weizmann Institute for Science, is a proof of the international recognition of Assoc. Prof. Tancheva's experience, qualification and scientific expertise.

Science-metrics

In the present competition Assoc. Prof. Tancheva participated with a habilitation-monograph on an extremely

up-to-date topic: "Drug metabolism and oxidative stress in influenza virus infection. Experimental approaches toward antioxidant protection ". By group of indicators "C" Assoc. Prof. Tancheva fulfils the required number of points.

In this competition Assoc. Prof. Tancheva participated with a total of 36 scientific publications and reports, 23 of which were published in Impact Factor (IF) journals or indexed and referenced in world-renowned scientific data databases (according to the Scimago Journal Rank, SJR). In 16 of these publications Assoc. Prof. Tancheva is a leading (first or last) author. All 36 scientific papers were published after taking the academic position "Doctor". The total number of points by group of indicators "D" is 354 (required 220). In addition, it should be mentioned the outstanding scientific activity of Prof. Tancheva. During the period of time 2010-2019 she has been participated in 45 scientific forums (international and national) and presented a total number of 81 posters, abstracts and reports. Assoc. Prof. Tancheva is a co-author of a patent application, which is not included in the competition. According to world-renowned databases (Scopus, WoS), the total number of citations of the publications included in the competition is 39. According to the criteria of group "D" Prof. Tancheva significantly exceeds the required minimum (540 points with a minimum of 150).

From the official report it is clear that during the period of time 2004-2019 Prof. Tancheva was a leading researcher in a total of 23 research projects (19 national and 4 international), at which she was a manager/coordinator of 6 of them (3 national and 3 international). It is noteworthy that since 2004 Assoc. Prof. Tancheva is the leader of the Bulgarian side of a bilateral EBR project, which is a proof of the value of the applicant's research and, at the same time, a good basis for education and training of young researcher in the field of neurobiology in Bulgaria. As a confirmation of this is the fact that since 2009 Assoc. Prof. Tancheva has been a supervisor of 11 grandaunts and students, 5 PhD students, one of them successfully defended, one with right of PhD defence, and 3 are currently working on their PhD projects. I would like to mention the doctorate, defended in 2015, to which Assoc. Professor Tancheva has been supervisor. The presented dissertation thesis deals with a very complex and up-to-date topic related to neuropsychopharmacological studies of new peptidomimetics. Taking into account the above-mentioned scientific research, the total number of points of Assoc. Prof. Tancheva by group of indicators "E" is 605, which significantly exceeds the minimum required of 150 points.

From the presented science-metrics data, as well as from the official report it is evident that Assoc. Prof. Tancheva responds and even significantly exceeds the general indicators for the minimum requirements, which are indicated in the LDAS of the Republic of Bulgaria and the Regulations for its application, as well as the INB Rules of the Bulgarian Academy of Sciences for occupying the Academic position "Professor" in the scientific specialty "Pharmacology".

Pedagogical activity

Prof. Tancheva has a highly intensive pedagogical activity. For more than 10 years she has lectured courses in Pharmaceutical Toxicology of Pharmacy students, as well as lectures on post-graduate qualification of Master Pharmacists at the Pharmaceutical Faculty of MA Sofia. In recent years Assoc. Prof. Tancheva is a guest lecturer at the Faculty of Natural Sciences of the South-West University "Neofit Rilski" - Blagoevgrad, where she has lectured courses on pharmacology and drug toxicology.

Scientific topics and achievements

The main scientific activity of Assoc. Prof. Tancheva is related to the period of her career in the Institute of Medicine at the Bulgarian Academy of Sciences. According to the performed report on the contributions of scientific papers, the list of publications and their citations, the patent application, as well as the numerous contributions to international and national scientific forums it can be asserted that Assoc. Prof. Tancheva is an established, internationally recognized and independent scientist. She has contributed to the elucidation of a number of pathogenetic processes associated with major neurodegenerative and neurological diseases. Assoc. Prof. Tancheva has been involved in the development of experimental approaches and methodologies for the prevention of socially significant diseases, such as Parkinson's disease, Alzheimer's disease, aggression, social depression, various depressions, and autism. An evidence of the scientific applicability of her research is a recently filed patent application No. 112806 (25.09.2018) entitled "*Adamantine derivative with antiviral and antiparkinsonian activity*". According to the her own definition, the scientific activity of Assoc. Prof. Tancheva is divided in five main directions:

The first one and the most significant ones (12 scientific papers cited) is related to the development of new experimental data on significant effects of various peptidomimetics (L-valine, cannaban and neurotensin derivatives) as well as new compounds of galantamine and amantadine on rodent function in rodents and related biochemical correlations. For the first time in Bulgaria, the toxicological and cognitive effects of structural analogues of galantamine and amantadine have been studied. In particular, the changes in neuromuscular coordination and behavior in rodents, as well as the effect of these newly synthesized analogues on the metabolism of cytochrome P-450 substrate models, have been investigated. Additionally, for the first time in our country there were found side effects of galantamine and amantadine derivatives with respect to their antioxidant (*in vivo* and *in vitro*) activity in the rat brain.

The second research field of Assoc. Prof. Tancheva is related to the conduction of neurobiological and psychopharmacological studies of newly synthesized analogues on experimental models of a number of socially significant diseases (aggression, social depopulation, depression, autism). The effects of new valine peptidomimetics on models of experimental aggression and social isolation in rodents were investigated. Together with colleagues from the Arizona Institute of Neurobiology of Weizmann Institute of Science, Assoc. Prof. Tancheva for the first time worldwide investigated the effects of a new structural analogue of neurotensin (NT4) on the social activity of two mouse models (C58BL/6 and BTBRT) using innovative tests for investigation of social behavior and social novelty. The data obtained by Assoc. Prof. Tancheva have made an important contribution to the study of such diseases as autism and social isolation.

The third research area of Prof. Tancheva is one of the most promising due to the fact that it is related to the introduction and application of experimental approaches to study the effect of newly synthesized substances on prevention and therapy of Parkinson's disease. The neuroprotective effects of neurotensin analogues (NT2 and NT4) have been investigated for the first time in Bulgaria. The obtained data show that these substances increase the content of the neurotransmitter dopamine in the rat brain. Furthermore, the neuroprotective effects of an original novel molecule (Amantadir) were also studied using a toxin-induced Parkinson's disease model. The experimental models applied by Assoc. Prof. Tancheva are of great importance for scientists worldwide to study the *in vivo* effects of potential clinical candidates for the treatment of neurodegenerative diseases such as Parkinson's disease.

The fourth research field of Assoc. Prof. Tancheva is related to the study of the effects of a number of natural substances for the treatment of neurodegenerative diseases. A number of *in vivo* effects of the monoterpene myrtenal, elogamic acid, lipoic acid, and other natural compounds as potential therapeutics against Alzheimer's disease, as well as other types of dementia, have been investigated. For this purpose, one of the world's best experimental *in vivo* models of Alzheimer's disease has been used.

The fifth direction in the scientific work of Assoc. Prof. Tancheva is related to the study of new mechanisms of neurodegenerative processes and social isolation. In this research field are indicated 11 scientific papers. Scopolamine- induced *in vivo* models are used for the first time in Bulgaria. Extremely important for the scientific society are the results obtained by studying the mechanisms of aggression and early social isolation in adolescent rats.

Conclusion

From the review of the presented scientific output, gained and successfully developed high-value scientific projects (international and national), and participation in scientific forums it is clear that Assoc. Prof. Lyubka Tancheva is a proven, internationally recognized researcher in the field of neurobiology with strong interdisciplinary-oriented scientific research. In her professional career, she has been developed as an established and experienced scientist who has contributed to the development of neurobiology and toxicology not only in our country. In the years after her habilitation, she demonstrated remarkable ingenuity, patience and original thinking in search of new scientific knowledge, reflected in her high scientific metrics. With her fundamental and applied research, as well as with her active educational and pedagogical activity, Assoc. Prof. Lyubka Tancheva meets all the criteria set by the INB-BAS Regulations for acquiring the scientific rank "Professor". I recommend to the honorable scientific jury to support the awarding of Associate Professor Lyubka Tancheva as "Professor" in Pharmacology.

Sofia, 21. May 2019

Assoc. Prof. Dr. Nikolay T. Tzvetkov

Signature: