

## SCIENTIFIC STATEMENT

from **Prof. Maria Angelova, DSc**, The Stephan Angeloff Institute of Microbiology, Bulgarian Academy of Sciences

on the competition for the occupation of the academic position “Professor” in professional field: 4.3. Biological Sciences, scientific specialty (Microbiology – lactic acid bacteria and probiotics) at the Department of General Microbiology, Laboratory “Microbial Genetics”, presented to a Scientific Jury formed by order of the Head of SAIM № I-80/01.07.2020

The only candidate in the competition for "Professor" announced in the State Gazette, issue 47 of May 22, 2020 and on the website of The Stephan Angeloff Institute of Microbiology (SAIM), BAS, is Associate Professor Svetla Trifonova Danova, DSc from the same Institute.

### **1. General presentation of the procedure and the applicant**

For participation in the competition, Assoc. Prof. Svetla Danova, DSc, presented all documents and materials proving the fulfillment of the requirements for holding the academic position "Professor" on paper and electronic media. All of them are in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation, as well as with the Regulations of SAIMB, BAS. The documents also meet the additional criteria of the Institute.

Assoc. Prof. Danova graduated from the Biological Faculty of Sofia University “St. Kliment Ohridski” (Molecular and Functional Biology) and then acquired a second specialty “Teacher of Biology and Chemistry”. In 1997 she received the scientific and educational degree "Doctor" and in 2015 - the scientific degree "Doctor of Science". She has worked consecutively as a microbiologist at the Research Center for Biotechnology, Sofia and at Biological Faculty of Sofia University “St. Kliment Ohridski”, as an assistant at Sofia University, and since 2000 - as a Assist. Prof. at SAIM, where in 2005 she received her habilitation. Danova has more than 32 years’ scientific experience in the Microbiology. The scientific specializations in foreign laboratories (Nantes and Rennes, France), her work as a visiting researcher at the University of Stellenbosch, South Africa and the Fulbrigh Fellowship at the University of Phoenix, USA have contributed to her growth as a scientist.

Assoc. Prof. Danova is a member of the Scientific Council of SAIM, a member of the Expert Council on Food Safety at the Ministry of Health of the Republic of Bulgaria and an Independent Expert at the Executive Agency for SMEs for the Promotion of Small and Medium Enterprises. In addition, she is an external technical expert-microbiologist and technical evaluator at EA, BSA; as well as an external expert-microbiologist in the list of the Accreditation Commission at EA, BSA. Danova is a member of USB, SBB and BAM.

Assoc. Prof. S. Danova speaks three foreign languages - French, English and Russian and has high computer skill, which she applies effectively in her research.

The scientific career of the applicant is entirely related to Microbiology And Microbial Genetics and fits into the theme of the competition. Her research activity is focused on a detailed study of an important group of microorganisms, such as lactic acid bacteria (LAB); their molecular taxonomy, gene cloning and creation of genetic transfer systems, the production of biologically active substances, the creation of probiotics, starters crops and functional foods.

## **2. Characteristics of the applicant's activity**

### ***Research activity and achievements***

Assoc. Prof. Danova is the author and co-author of 125 publications with a total IF 66.290, of which 64 are indexed and referenced in journals in global databases, 32 - in journals without impact factor, 19 reports printed in full text, 7 chapters from books (5 in Bulgaria, 2 abroad), and 3 textbooks. The results of the applicant have been cited 1361 times (SCOPUS: 619), which determines the *h*-index 16 (Scopus - 13). Of all scientific papers, 76 are outside the competitions for the acquisition of ONS "Doctor" and the academic position of "Associate Professor". With them, Assoc. Prof. Danova covers and exceeds the required points on the individual indicators, and instead of the required 600 she gained 2999. They are distributed as follows:

- Group A indicators – PhD Autoreferat
- Group B indicators – DSc Autoreferat;
- Group C indicators - 10 scientific papers in IF journals (Q1 - 4, Q2 – 4, and Q3 – 2);
- Group D indicators – 33 scientific papers (Q1 - 4, Q2 - 12, Q3 –8; Q4 - 9), and 3 book chapters.
- Group E indicators – 619 citations (SCOPUS).
- Group F indicators – 6 successfully defended doctoral students, 24 graduates, 5 interns; more than 1500 hours of teaching at Universities; development of 2 university courses ("Food Microbiology" and "Biomedical Engineering"), participation in 23 projects, 6 in which she is a leader and in 4 - a consultant, participation in international and national training programs.

The applicant also exceeds the requirements of the additional criteria of SAIM. Twenty-seven papers with IF are presented, as in 19 of them she is the first or corresponding author, and this is an indication of her leading role in developing the problem and publishing the results. Assoc. Prof. Danova is very active in national and international scientific forums (total number 105 - invited speaker 9, co-author of 29 papers and 67 posters).

Here I want to note that Assoc. Prof. Danova successfully publishes in renowned specialized journals such as E. J. Biomed. Pharm. Sci. (4.918); J. Gen. Mol. Microbiol. (1.964); Biochemistry. Biophys. Acta (2.024); J. Appl. Microbiol. (2.5); Int. Dairy J. (2.4); Beneficial Microbes (2.61), which characterizes its production as current and at a modern scientific level.

The scientific works of Assoc. Prof. S. Danova fully cover the topic of this competition, namely LAB and probiotics. These are key terms for the 21st century that have become an emblem of the present and a hope for the future. The innovative character of scientific activity is justified by her striving to isolate new strains from hitherto unused sources, which she studies in detail and leads to practical implementation. Four directions can be outlined in the scientific production of the applicant in which she formulates important scientific and applied achievements:

**1. Biodiversity and polyphasic-taxonomic characteristics of LAB from different ecological niches.** Multifaceted studies of the microflora of Bulgarian dairy products have been conducted and data on the species diversity of the microbial populations have been obtained.

- Danova started in Bulgaria the systematized molecular genetic research of LAB from traditional Bulgarian products (cheese, ice cream, sour rye dough, cottage cheese, yellow cheese) and presented new data on species diversity and probiotic potential.
- A new molecular genetic approach has been successfully applied to distinguish the closely related species from the group of *L. plantarum* and their interspecies relationships.

➤ For the first time the method of polyphasic taxonomy has been used to characterize vaginal lactobacilli in healthy Bulgarian women.

**2. Functional characteristics and probiotic potential of LAB.** This topic focuses on the assessment of probiotic potential in accordance with the requirements of EFSA (2012) and WHO (2002) using different approaches.

➤ An algorithm for complex evaluation of newly isolated LABs, probiotic candidates, has been created, which has been successfully applied in research of traditional Bulgarian dairy products.

➤ For the first time in our country a complex assessment of the probiotic potential of lactobacilli from different ecological niches (of human origin, from dairy and cereal products) has been estimated through *in vitro* criteria of EFSA and WHO.

➤ As a result of the complex assessment of more than 200 Bulgarian LAB strains, promising probiotic candidates with a pronounced wide range of antibacterial and antifungal activity have been selected.

➤ New data on the synthesis, mechanisms of regulation and application of bacteriocins have been obtained.

**3. Assessment of technological significance and application of the Bulgarian LAB.** There are included studies aimed selection of probiotic strains for the development of new functional products.

➤ The potential of Bulgarian strains described as probiotic supplements with real possibilities for practical application on the functional dairy foods market has been proven.

➤ An appropriate method for storage of LAB has been developed, which allows high survival and possibility for effective use as probiotics.

➤ For the first time in our country, from non-industrial samples of white brined cheese were isolated and characterized *L. plantarum* strains, having the potential of probiotic additives for new functional foods.

➤ Prototypes of probiotic/bioprotective additives to starter cultures with appropriate technological indicators for the production of yogurt and pate cheese have been created.

**4. LAB in the development of new strategies for human health and longevity.** A new direction in the study of the useful role of probiotic LAB in the processes of interaction with opportunistic pathogens for balance in the human microbiome has been placed.

➤ The effect of selected Bulgarian LAB strains as probiotic on the treatment of *Escherichia coli* and *Candida albicans* has been evaluated.

➤ For the first time, data on the role of the electro-physical properties of bacteria, including the LAB in relation to the processes of commensalism and antagonism in the various microbial coenoses, have been obtained and published.

#### ***Educational activity***

The documents presented in the competition prove the dynamic and long-term activity of Assoc. Prof. S. Danova in the training of new scientists (see Group "E"). She taught at the Faculty of Biology at Sofia University "St. Kliment Ohridski", University of Chemical Technology and Metallurgy, Sofia and the Universities of Bitola and Skopje, Macedonia. Danova has trained graduates from bachelor's and master's programs, has supervised doctoral students (successfully defended and in the process of education).

### 3. Personal impressions of the applicant

I know Assoc. Prof. Danova since starting her PhD program at Sofia University “St. Kliment Ohridski” and her appointment at the SAIM. I have excellent impressions of her research work, her energy, scientific knowledge in the field of microbial genetics and in particular LAB, as well as of her efforts to make Bulgarian probiotic strains available to the international scientific community. I am convinced that these qualities will be very useful to her as a professor at SAIM.

### 4. Conclusion

Assoc. Prof. Svetla Danova, DSC, is an approved and promising scientist in the field of this competition (Microbiology - lactic acid bacteria and probiotics), recognized at both national and international level, with very high scientometric indicators. In her scientific career she has grown not only as a researcher, but also as an active manager of scientific studies, a preferred partner by Bulgarian and foreign scientific institutions, a successful disseminator of knowledge and skills. Certificate for the quality of her scientific production are the renowned journals, the high IF, the numerous citations and the high *h*-index, her leading place in the publications. The formulated scientific and applied achievements contribute to the increase of knowledge in Microbiology and Microbial Genetics and are an important basis for new attainment.

In view of all mentioned above, I strongly recommend to the Scientific Jury, formed by order № I-80/01.07.2020 of the Director of SAIM to prepare a report-proposal to the Scientific Council for the selection of **Assoc. Prof. SVETLA TRIFONOVA DANOVA, DSc**, at the academic position of "**Professor**" at SAIM-BAS in the field of higher education: 4. Natural Sciences, Mathematics and Informatics, Professional Degree: 4.3. Biological Sciences, scientific specialty “Microbiology – lactic acid bacteria and probiotics” at the Department of General Microbiology, Laboratory “Microbial Genetics”.

10.09.2020  
Sofia

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/Prof. Maria Angelova, DSc/