

REPORT

**on a competition for academic position of Associate Professor
in professional field 4.6 “Informatics and Computer Science”, scientific
speciality “Informatics (Informational models in genomics)”, announced
in SG, issue 91/29.01. 02.11.2021
for the needs of the Institute of Mathematics and Informatics – BAS,
with a single applicant
Dr. Roumyana Yordanova, Assistant Prof. at IMI-BAS**

1. Dr. Roumyana Yordanova was born on 28.01.1969 in Sofia. She graduated from Sofia University “St. Kliment Ohridski” in 1992 with a master's degree in Informatics; she attended courses in Cognitive science program at New Bulgarian University (1995 – 1996), and in the period 1998-2004 she was a PhD student and defended dissertation titled “Markov chain decomposition and characterization of hypertensive blood pressure with applications to linkage analysis” in Marquette University, Milwaukee, US. Her PhD thesis was legalized in the Institute of Mathematics and Informatics – BAS.

Between 1994-1994 she was a researcher (now – assistant) in the Institute of mathematics and Informatics – BAS, between 2005-2006 she was a researcher at University of Tennessee, Knoxville, between 2007 – 2013 she worked as a senior researcher at Bristol-Myers Squibb, Pennington, NJ, US, since 2013 she is assistant at the Institute of Mathematics and Informatics – BAS and (since 2016) she is a researcher at Hokkaido University, Sapporo, Japan.

From the submitted documents is clear that the candidate has more than 2 years of working as an assistant at the Institute of Mathematics and Informatics – BAS and therefore satisfies the requirement according to Art 29 (1), p.2 of LDASRB and Art 60 (1), p.2 of RALDASRB.

2. In the following table are shown the total number of points of the candidate and the necessary minimum number of points in groups of scientometric indicators, according to Art. 2(1) of the Regulations on the terms and conditions for obtaining scientific degrees and for holding academic positions of Institute of Mathematics and Informatics – BAS:

Points for the field 4. Natural sciences, mathematics and informatics
for the academic position of "Associate Professor"
of Dr. Roumyana Yordanova

Group of indicators	Minimum number of points	Number of points of the applicant
А	50	50
Б	-	-
В	100	150
Г	220	290
Д	70	84
Е	20	40

Below, using the numbering nomenclature from the file *„Списък с публикациите за конкурса на Румяна Кирова Йорданова“* will point out that she submitted:

А) Instead of a habilitation thesis there are 3 publications [4, 7, 9] in journals with total impact factor above 50 all of which are in quartile Q1

Б) 6 papers in journals with impact factors and in quartiles Q1 and Q2.

2 papers in journals with SJR-factor.

This completes the requirement according to Art. 3(1) of the Regulations on the terms and conditions for obtaining scientific degrees and for holding academic positions of Institute of Mathematics and Informatics – BAS.

My opinion is that Dr. Yordanova could have transferred at least one of the papers from Group Б to group А. Doing this the points in group Г would not have fallen below the required minimum, but the total number of pages of the papers in group А submitted to BDS would have exceeded 100 – one of the BDS requirement for monography. The size of the three papers in group А submitted to BDS are around 35,30 and 20 pages. The other opportunity would have been if she included at least one additional paper outside of the ones listed in the file *„Списък с публикациите за конкурса на Румяна Кирова Йорданова“*. Nevertheless, she has enough material that be used for a monography, and I strongly recommend to her to write such.

All the papers of Dr. Yordanova are written in collaboration with biologists, published in journals in the field of biology and are designed to be read by biologists. That is why they are written in a form that for a mathematician in general will be quite difficult to see the mathematics since it usually stays behind the main theme. As a person who has worked 40 years with doctors and biologists can confirm that behind the pure biological texts are hidden several different mathematical fields: combinatorial analysis (in papers [1,3,5,7,10,11]), graph theory (in paper [3,10]), mathematical statistics (in each of the papers), probability theory (in papers [1,11]), methods related to artificial intelligence such as image or signal recognitions (in papers [2,3,5]), BigData and others, as well as a number of different programming tools for realization of the mathematical results. In the last 40 years these type of research is usually known as bioinformatics.

It is important to point out that the results published in the eleven papers have in total more than 250 citations listed in the file „Списък с цитирания на публикациите за конкурса на Румяна Кирова Йорданова“, which clearly shows their high quality.

I accept the contributions of Dr. Yordanova described in the file „Авторска справка за научните приноси на д-р Румяна Кирова Йорданова“. In my opinion they correctly reflect the content of the publications with which she participated in the competition and that is why I will not comment them in more details. I will only mention that they are grouped by the candidate in three groups and I agree that this grouping is suitable:

1. Methods for “Systems Biology Analysis” and associations between different “omics” data
2. Methods for analysis of microarray genomics data including time series microarrays.
3. Analysis of microbiological genomics data to model the antimicrobial resistance.

I will point out that the most interesting for me are results in paper [9] which can be interpreted as intuitionistic fuzzy types and papers [8,11]. The paper [8] is a clear example of what was said above that the mathematics is not immediately obvious. In this paper there are no mathematical formulas, but behind the ideas, written in biological terms are hidden pure mathematical concepts which in my opinion can be interpreted through the means of some of Petri's nets types. Similar interpretation can be made for results of paper [11]. It is also clear that the numerical data in those and other papers are result of the programming implementation of the described objects.

All papers are published in the years after the PhD thesis defense of Dr. Yordanova.

My critical remark is related only with the layout of the candidate's documents. Her articles are numbered differently in different places, making it difficult for reviewers to work with.

It is also strange that in the file „Списък с цитирания на публикациите за конкурса на Румяна Кирова Йорданова“ there are (if I counted them correctly since they are not numbered) 257 citations, while in the file „Справка за изпълнение на минималните изисквания от кандидат в конкурс за академична длъжност „доцент“ в ИМИ-БАН“ are listed only 14 citations which give 84 points while the real points are above 1500.

In the above file „Справка“ is also shown that the candidate participated in 4 projects, one of which is part of “Scientific Research Fund” which meets the requirement for this criteria.

3. According to the file „Пълен списък с публикациите на Румяна Кирова Йорданова“ she is author of 24 публикации in total, and the total count of citations shown in the file „Всички цитирания от Scopus на статиите на Румяна Йорданова“ are approximately above 900 (since they are not numbered).

4. Although it is not clearly stated based on her Autobiography she was teaching statistics and calculus I for Bachelor students and Biostatistics for Master Students in the period of 2017-2020 in Hokkaido University, Sapporo, Japan.

I do not know personally Dr. Yordanova.

The stated above is a reason to give a positive assessment of the materials for participation in the competition and to confidently recommend to the honorable members of the Scientific Jury to vote to award **Dr. Roumyana Kirova Yordanova** the **academic position “Associate Professor”** in professional field **4.6 “Informatics and Computer Science”**, **scientific specialty “Informatics (Informational models in genomics)”**

13. 02. 2022 г.

Signature :

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