R E V I E W

by **Corr. Member Prof. Lyubka Atanasova Doukovska, PhD, DSc**
from the Institute of Information and Communication Technologies,
at the Bulgarian Academy of Sciences,
on the Competition for the academic position "**Associate Professor**",
under the Scientific Field: 4. Natural Sciences, Mathematics and Informatics,
the Professional Area: 4.6. Informatics and Computer Sciences,
(Informatics Models in Genomics),
for the needs of the Institute of Mathematics and Informatics –
Bulgarian Academy of Sciences,
announced in State Gazette No. 91/02.11.2021

with a participant - **Roumyana Yordanova, PhD**

In accordance with Order No. 342/23.12.2021 of the Director of the Institute of Mathematics and Informatics – Bulgarian Academy of Sciences, I was included in the Scientific Jury of the competition for occupation of the academic position "Associate Professor" in the Scientific Field 4. Natural Sciences, Mathematics and Informatics, the Professional Area 4.6 Informatics and Computer Science (Informatics Models in Genomics), announced in the State Gazette, Issue 91 of 02.11.2021, for the needs of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, with the sole participant in the competition - **Roumyana Yordanova, PhD**.

I. General information about the applicant.

Rumyana Kirova Yordanova obtained her master's degree in 1992 at the Faculty of Mathematics and Informatics at Sofia University "St. Kliment Ohridski", majoring in

Informatics. In 2005 she received her PhD from Marquette University, Milwaukee, Wisconsin, USA, majoring in Biomathematics.

In the period 1994-1998 she was a research associate at the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences. From 1998 to 2004 she was an assistant professor at the Bioinformatics Research Center, Marquette University, Milwaukee, Wisconsin, USA. In 2006, she was a postdoctoral fellow at Oak Ridge National Laboratory and at the University of Tennessee, USA. In the period 2007-2013 he was a senior researcher at Bristol-Myers Squibb, Pennington, New Jersey, USA. In 2016 she was a consultant for the same company. In the period 2017-2020 she was a consultant to Alexion Pharmaceuticals, USA. Since 2016 she has been part of the research team of Hokkaido University, Sapporo, Japan Hokkaido University, Sapporo, Japan. Since 2013 she is again part of the research staff of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences.

II. General characteristics of the submitted documents and works.

As a member of the Scientific Jury I have received the following documents:

1. Order No. 342/23.12.2021 of the Director of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences.

2. Application to the Director of the Institute of Mathematics and Informatics for admission to the competition.

3. Professional CV in European form.

4. Common list of publications.

5. List of publications for participation in the competition.

6. A self-signed reference to the original scientific contributions of to the works submitted for the competition participation.

7. Abstracts of the publications submitted for participation in the competition in Bulgarian language and in one of the languages traditionally used in the relevant scientific field.

8. Copies of the publications under item 5.

9. Common citations list.

10. List of citations submitted for participation in the competition.

11. Copy of the State Gazette No. 91/02.11.2021 announcing the competition.

12. Certificate of internship in the specialty in accordance with the requirements of Art. 24 para 1 item 2 of the *Development of Academic Staff Act in the Republic of Bulgaria*.

13. Information on a model for implementation of the minimum national requirements under Art. 2b, # 2 and # 3 and # 5 of the *Development of Academic Staff Act in the Republic of Bulgaria*, as well as the minimum requirements of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, to which the necessary evidence is attached.

14. Sample declaration.

15. Declaration of consent for storage and processing of the personal data of the applicant.

In accordance with the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* and the specific requirements in the Act's Institutional Regulation, the candidates for occupying the academic position of "Associate Professor" must meet the following conditions, regulated in Art. 24. (1):

1. Have acquired an educational and scientific PhD degree;

2. Have held for at least two years the academic position of Assistant Professor;

3. Have submitted published monographs or equivalent publications in specialized scientific publications that do not repeat the ones submitted for the PhD degree;

4. To comply with the minimum national requirements under Art. 2b, # 2 and # 3, respectively, of the requirements of art. 2b, # 5;

5. Not to have plagiarism in the scientific publications proven by the legislation order.

III. General characteristics of the applicant's scientific, applied and teaching activities.

The candidate works in a very promising and current scientific field, which is a guarantee for achieving good results, with guaranteed publicity among the world scientific community. According to the presented author's report, **Rumyana Kirova**

Yordanova, **PhD**, participated in the competition with eleven publications. All publications are indexed in global databases of scientific information, including nine indexed in the Web of Science with Impact Factor and SCImago Journal Rank [1, 2, 4, 5, 7, 8, 9, 10], two are indexed in Scopus with SCImago Journal Rank [6, 11].

The publications submitted were not used in the procedures for obtaining the PhD degree and the scientific position of "Assistant Professor". All publications are in the field of competition.

The submitted by the candidate publications are original and I do not know of plagiarism.

The scientific activity of the candidate is in the field of information methods in genomics. It is mainly related to the development and application of bioinformation and statistical methods for analysis and integration of microbiological data of the type "omics" including gene expressions and sequences of the whole genome or exom, RNA and DNA expressions, SNP (single nucleotide polymorphisms) and other mutational data. The achieved results are aimed at finding new directions for the treatment of various diseases such as cardiovascular, atherosclerosis, oncological, rare immunological, autoimmune and others.

Scientific and applied contributions can be systematized by:

1. Methods for systematic biological analysis and associations between different "omics" data.

This includes results related to information approaches for analyzing global genomic data to find specific polymorphisms associated with complex phenotypes, methods for building high-resolution networks of associations between polymorphisms, RNA expressions and genomic data such as microchip expression, and methods for finding the interactions between genes and the environment [1, 2, 3, 4, 5].

2. Methods for analysis of micromassive genomic data, including dynamic data.

This includes results from the analysis of dynamic micromassive data from laboratory mice using statistical methods [6], graphical models [7], generalized logical networks [8], and an ontological database of phenotype-centered genomic associations [9].

3. Analysis of microbiological genomic data for modeling antimicrobial resistance.

These include the results obtained from the developed bioinformatics methods for analysis of genomic data from bacteria and modeling of antimicrobial resistance [10].

I accept the author's reference for the contributions in the works with which **Rumyana Kirova Yordanova, PhD** participated in the competition, the results being scientific, scientifically applied and applied in nature and can be defined as enrichment of an existing scientific field with new knowledge.

The citation report presented by **Rumyana Kirova Yordanova, PhD** shows a number of 1017 citations in Scopus and 1051 in Web of Science. I agree that this number is at the time of submission of the competition documents and no new citations have been included.

Rumyana Kirova Yordanova, PhD has been a member of a team of four scientific projects.

IV. Critical notes and recommendations.

I have no critical comments on the materials submitted by the applicant for the participation in this competition. I would like to recommend to **Rumyana Kirova Yordanova** to focus her efforts in working with PhD students in order to pass on her scientific experience to the next generation of Bulgarian researchers in the field of information technologies.

V. Personal impressions of the candidate.

I do not know the candidate for this competition **Rumyana Kirova Yordanova**, but I am very impressed by her research activities. I believe that she is a scientist with enviable knowledge and skills.

VI. Conclusion.

In conclusion, I agree that the requirements of the Law for the *Development of Academic Staff Act in the Republic of Bulgaria* and the specific requirements in the Act's Institutional Regulations for its implementation, the Rules for the conditions and the order for acquiring academic degrees and for the occupation of academic positions in the Bulgarian Academy of Sciences and the Rules for the specific conditions for acquisition

of academic degrees and occupation of academic positions at the Institute of Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences are accomplished. After getting acquainted with the materials submitted by the applicant for the competition, I give my positive estimation about the choice of **Rumyana Kirova Yordanova, PhD** in the competition for the academic position of "**Associate Professor**" for the needs of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, in the Scientific Field 4. Natural Sciences, Mathematics and Informatics, the Professional Area 4.6. Informatics and Computer Sciences (Informatics Models in Genomics).

I propose that the Scientific Jury unanimously vote for a proposal to the Scientific Council of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, to elect **Rumyana Kirova Yordanova, PhD** for the academic position of "**Associate Professor**" in the Scientific Field 4. Natural Sciences, Mathematics and Informatics, the Professional Area 4.6. Informatics and Computer Sciences (Informatics Models in Genomics).

31.01.2022   Signature: …………………………………

Sofia

/Corr. Member Lyubka Doukovska, PhD, DSc/