

## OPINION

by **Prof. Dr. Ivanka Istalianova Dimova**, PhD, Department of Medical Genetics, Medical University - Sofia, elected as a member of the Scientific Jury, determined by Order No. P-109-515/ 30.11.2023 of the Rector of the Medical University - Varna for the **academic position "Associate Professor"** - 1 place, in the field of higher education 4. Natural sciences, mathematics and informatics, Professional direction 4.3. Biological sciences, for the needs of the "Medical Genetics" Department, Faculty of "Medicine" of the Medical University - Varna and Laboratory of Medical Genetics at UMBAL "Sveta Marina" EAD - Varna. The competition was announced in the State Gazette No. 83/03.10.2023.

For participation in the competition, documents were submitted by one candidate - **Chief Assistant Dr. Maria Kostadinova Levkova, db.**

The opinion was drawn up according to the required criteria of the Law for the development of the academic staff in the Republic of Bulgaria and the Regulations for its implementation, as well as the Regulations of the MU-Varna for occupying the academic position "Associate Professor". The scientific research and teaching activities of the candidate are evaluated based on the indicators according to the Appendix to Art. 1a, para. 1 of the Regulations for the implementation of the Law and according to Appendix No. 1 to the Regulations for the development of the academic staff at MU-Varna.

### **BIOGRAPHICAL DATA AND CAREER DEVELOPMENT**

Dr. Maria Kostadinova Levkova completed her higher education with a Master of Human Medicine degree in 2016 at the Medical University of Varna, as the top of her class. From 2017, she was appointed to the position of "assistant", and from 2021 - "chief assistant", in the Department of Medical Genetics of the Medical University "Prof. Dr. Paraskev Stoyanov"-Varna. In 2021, she acquired the specialty of Medical Genetics, in the same year she was awarded the educational and scientific degree "PhD" after a successfully defended dissertation on the topic "Molecular-genetic and immunological biomarkers in the medical-genetic counseling of families with infertility". From 2021, he holds The European Certificate in Medical Genetics and Genomics (ECMGG), obtained after successfully passing an exam. Excellent command of English and German, written and spoken.

### **GENERAL PRESENTATION OF SCIENTIFIC ACTIVITY**

Dr. Maria Levkova has attached a total of 22 publications, of which 17 in English and 5 in Bulgarian, distributed as follows:

- **8 publications in journals with an impact factor (of them - 3 Q1, 4 Q2 and 1 Q3),** in 3 of them (37.5%) he is the lead author
- **12 publications in journals, referenced and indexed in world-renowned databases for scientific information,** without an impact factor (of them - 3 Q3 and 9 Q4) – in 5 of them (42%) is the lead author
- 2 publications in non-refereed peer-reviewed journals

Dr. Levkova's scientific output has been presented at 18 scientific forums - 10 foreign and 8 national. She is the first author:

- In 6 out of a total of 27 (22.2%) poster participations at foreign forums
- In 4 out of 15 participations in national scientific forums – 26.7%.

Dr. Levkova is a member of scientific team in a total of 6 scientific projects - 4 with funding from the Medical University of Varna and 2 with European funding under the Recovery and Sustainability Plan.

## **CHARACTERISTICS AND EVALUATION OF THE CANDIDATE**

### **Teaching and learning activity**

Dr. Maria Levkova teaches "Medical Genetics" for specialties: Medicine (in Bulgarian and English), Pharmacy, Midwifery, Nurse, Medical Laboratory Assistant. According to the teaching report for the last five years, there is an average teaching load of 245 study hours per year, including practical exercises - an average of 94 study hours per year in Bulgarian teaching and 151 study hours per year in English teaching.

### **Research activity**

For participation in the competition, 20 summaries of scientific works, as well as an annotation of the dissertation work, are presented. The main directions in which she intensively works are as follows:

- **Medical-genetic counseling for families with reproductive problems:** certain molecular-genetic and immunological biomarkers were studied to establish their role in the etiology of infertility; analyzed the type, frequency and clinical significance of chromosomal (conventional and submicroscopic) aberrations and polymorphic variants in patients with reproductive disorders (infertility, spontaneous abortions, stillbirths, children born with malformations with or without development delay, alone or in

- combination with other failure); the impact of chromosomal polymorphisms observed in families with reproductive failures in the Bulgarian population was studied
- **Molecular genetic analyzes in male infertility:** for the first time, a systematic review and meta-analysis was performed based on information on the carriage of pathogenic variants in dynein-related genes in case-control studies to create a list of the most important dynein-associated candidate genes that may contribute to male infertility; a detailed review of the studied gene panels related to male infertility; microdeletions of the Y chromosome in spermatogenesis failure were studied in detail; investigated the IVS8-5T variant and TG repeats in men with impaired spermatogenesis
  - **Investigation of the role of small non-coding RNAs in carcinogenesis:** the characteristics of circular RNAs (circRNAs) and their role as potential prognostic and diagnostic biomarkers in colorectal carcinoma (CRC) were studied; investigated single nucleotide polymorphisms (SNPs) in microRNA (miRNA) genes that may be associated with CRC predisposition and therefore disease prognosis and/or treatment response;
  - **Study of hereditary predisposition to thrombophilia:** a meta-analysis was performed on the role of hereditary predisposition to thrombophilia in the etiology of ischemic strokes in young people; investigated the role of thrombophilic variants among high-risk patients with vascular thrombotic disorders and in women with recurrent pregnancy loss;
  - **Genomic analyzes and genetic counseling for malformative syndromes, impaired neuropsychological development and rare diseases:** results of a cytogenetic analysis carried out in children with suspected chromosomal pathology over a 10-year period are presented; selective screening for fragile X syndrome among high-risk children with intellectual disability/developmental delay/autistic behavior was performed to establish the value of selective screening in a high-risk population; cases with rare genetic diseases and syndromes have been studied in detail, such as: double aneuploidy - a combination of trisomy 21 and an additional X chromosome, Bardet-Biedl syndrome, Cornelia de Lange syndrome, 16p11.2 duplication syndrome, Congenital myasthenic syndrome; gut microbiome study in children with autism spectrum disorders.

According to the academic reference prepared by the Library, MU-Varna, the scientific works of Dr. Maria Levkova have 25 citations. The total impact factor of the publications presented by the candidate is 28.743, and the individual one – 6.43.

## Scientific indicators and requirements

A group of indicators	Minimum requirements of the MU Varna for "Associate Professor"	Dr Levkova - points	Dr Levkova - fulfillment in %
A	50	50	100%
Б	-	-	-
B	100	107	107%
Г	200	216	108%
Д	50	50	100%
<b>Total</b>	<b>400</b>	<b>423</b>	<b>105%</b>

Dr. Maria Levkova fulfilled the required indicators from 100 to 108%, on average 105%, i.e. fully covers the minimum number of required points.

### Conclusion

The professional development of Chief Assistant Dr. Maria Levkova is oriented towards the use and validation of the most modern highly specialized activities in the field of Medical Genetics in Bulgaria. She contributed to the study and creation of an optimal approach in the diagnosis of rare diseases and reproductive disorders. Her academic performance fully covers the minimum required number of points for the academic position "Associate Professor" at the MU, Varna.

With all this in mind, **I confidently recommend to the esteemed Scientific Jury to award Dr Maria Kostadinova Levkova, PhD, the title "Associate Professor" in the professional direction "Biological Sciences", for the needs of the Medical University - Varna.**

Reviewer:

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/Prof. Ivanka Dimova, MD, PhD/

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