OPINION

from **Prof. Dr. Ivaylo Stefanov Stefanov**, PhD, Faculty of Medicine, Burgas University "Prof. Dr. Assen Zlatarov", Chairman of the Scientific Jury of the competition for the academic position "Associate Professor" under Order № РД - 270/15.09.2022 of the Rector of "Prof. Dr. Assen Zlatarov" University, Burgas.

Subject: Competition for the academic position "Associate Professor" in the scientific specialty "Cell biology", in the field of higher education 4. Natural sciences, mathematics and informatics, professional area 4.3. Biological Sciences announced in the State Gazette, issue 45 of 17. 06. 2022 for the needs of the Department of "Biology, Medical Genetics, Microbiology", MF, Burgas University "Prof. Dr. Assen Zlatarov".

Materials for participation in the competition have been submitted by one applicant - Assistant Professor Dr. Vesselina Stoyanova Merhar from the Department of "Biology, Medical Genetics, Microbiology", Faculty of Medicine, Burgas University "Prof. Dr. Assen Zlatarov".

The set of materials presented by the applicant is in accordance with national regulations for academic positions, comply with the specific requirements of the regulations of the Burgas University "Prof. Dr. Assen Zlatarov" and include all required documents.

I. Career profile of the applicant

Assistant Professor Dr. Vesselina Stoyanova Merhar graduated in 1986, at the Faculty of Biology, Sofia University "St. Kliment Ohridski", specialty "Molecular and functional biology" with acquired master's degree in biology. She continued her education until 1993 at the Institute of Plant Physiology, Russian Academy of Sciences, Moscow. In the same year, she received the Educational and Scientific degree "Doctor" in the scientific specialty "biology" after after completing a PhD thesis on the topic "Soluble proteins of wheat embryos in relation to seed viability".

From 1986 to 1989, Dr. Merhar worked as biologist at the Institute of Physiology, Bulgarian Academy of Sciences - Sofia, and from 1994 to 2000 she was selected as a Research Associate II degree in the Institute of Plant Physiology, Bulgarian Academy of Sciences (BAS). From 1997 to 2000, she was a postdoctoral researcher at the University of Bloemfontein, Republic of South Africa. From 2001 to 2002 she worked as a Research Assistant in the University of KwaZulu-Natal, Durban, Republic of South Africa, then from 2003 to 2009 she worked as a Research Associate in the Laboratory of Electron Microscopy at the same University. She has extensive experience as a specialist and consultant in microscopic techniques (2009 - 2013).

Her professional path as a teacher and researcher at the Burgas University "Prof. Dr. Assen Zlatarov" started in 2019 at the Medical College where she taught the subject "Pharmaceutical Botany". From 2020 until now, she has held the position of Assistant Professor

at the Department of "Biology, Medical Genetics, Microbiology", Faculty of Medicine, Burgas University "Prof. Dr. Assen Zlatarov".

The candidate's career growth includes active research work in several main morphological areas that fully corresponds to the scientific area 4. Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences, scientific specialty "Cell Biology":

- Biochemical-molecular study of the resistance of wheat to leaf rust.
- Influence of mycoflora on the damage of recalcitrant seeds during their short-term hydrated storage and microscopic studies of the consequences of fungal infections in recalcitrant and orthodox seeds
- Nucleo- and cytoskeleton responses to dehydration in recalcitrant seeds of *Trichilia dregeana*
- Placental lymphangiogenesis in preeclampsia

An important part of Dr. Merhar's career development is her participation in 5 international research projects, one of which she is the leader of.

Remarkably, Dr. Merhar has mastered a variety of classical and modern methods, including immunohistochemical and immunocytochemical methods combined with laser-confocal microscopy to conduct research. These methods enable nanoscale observations of cell structures, temporal dynamics of live cell images, quantitative image analysis of cell populations, and other observations with wide application in cell biology and ensure detailed image analysis and original contributions that are not only fundamental but also scientifically applied.

The candidate's excellent literary awareness allows her a thorough interpretation of the results of scientific research, a detailed comparative analysis of the available literary sources and the formulation of important conclusions.

The obtained original scientific results have been published in peer-reviewed international journals with a significant Impact Factor.

Evaluation of the candidate's scientific works.

Dr. Veselina Merhar has presented 12 articles (in English and Russian) in refereed journals, 7 of which are with an impact factor, 6 publications in peer-reviewed collections of scientific forums, two chapters of books, a PhD dissertation and a monograph. The candidate's personal contribution to scientific research is highlighted by her participation in 6 publications where she is the lead author, in 1 publication she is a second author, in three publications – a third, and in the rest she is in a fourth and subsequent places.

A list of 60 citations in foreign specialized journals has been attached.

Dr Vesselina Merhar participated in the 5 international scientific research projects, in one of which she was the leader.

She participated with posters and reports in 16 international and 4 national Scientific Forums, as well as in 3 student' sessions in Bulgaria. She was the first author in 12 presentations.

Dr. Vesselina Merhar attached a very well-prepared detailed report on the contributions of scientific works, which accurately reflects her achievements in various scientific fields of

fundamental and scientific-applied importance. The main scientific contributions of the candidate are related to:

1. **Biochemical-molecular study of wheat resistance to leaf rust.**

Original results are presented regarding the mechanisms and changes at the cellular and molecular level that make a selected wheat cultivar carrying the gene *Lr35* resistant to leaf rust.

2. **Influence of mycoflora on the damage of recalcitrant seeds during their short-term hydrated storage and microscopic studies of the consequences of fungal infections in recalcitrant and orthodox seeds**

The scientific contributions are related to tracking the changes occurring in the cells of different types of recalcitrant seeds after infection with *Fusarium moniliforme* and establishing the important factors for the high sensitivity of recalcitrant seeds to fungal infections.

3. **Nucleo- and cytoskeleton responses to dehydration in recalcitrant seeds of *Trichilia dregeana***

By means of TEM and immunofluorescence methods, significant ultrastructural changes in the cells, as well as in the cyto- and nucleoskeleton of *Trichilia dregeana* embryos subjected to dehydration, have been demonstrated.

4. **Placental lymphangiogenesis in preeclampsia**

Immunoexpression of the lymphatic markers LYVE-1 and PODOPLANIN in the placenta of HIV-infected normotensive versus preeclamptic women was found to determine the differential distribution of these markers in the fetal circulation. The advantages of computer morphometric image analysis for the precise quantification of immunoexpression in biological tissue were also highlighted.

The teaching activity of Dr. Vesselina Merhar includes conducting a significant number of hours of practicals and lectures in the following disciplines:

• "Cytology, General Histology and Human Embryology", specialty Medicine, 1st semester - Faculty of Medicine, Burgas University "Prof. Dr. Assen Zlatarov"

- Lectures – 30 hours
- Practicals – 90 hours

• "Microscopical Anatomy", specialty Medicine, I, II and IV semester, Faculty of Medicine, Burgas University "Prof. Dr. Assen Zlatarov"

- Practicals – 120 hours

• "Biology", specialty Medicine, II semester, Faculty of Medicine, Burgas University "Prof. Dr. Assen Zlatarov"

- Seminars – 120 hours

• "Biology", specialty medical assistant, 1st semester, Faculty of Health Care, Burgas University "Prof. Dr. Assen Zlatarov"

- Lectures – 24 hours
- Practicals – 9 hours

The candidate has fulfilled the required criteria for occupying the academic position "associate professor", according to the Regulations for the terms and conditions for acquiring scientific degrees and for occupying academic positions at the Burgas University "Prof. Dr. Assen Zlatarov ":

Group of indicators	Content	Assoc. Professor	Assistant Professor Dr. Vesselina Merhar
A	Indicator 1	50	**50**
B	Indicator 3	100	**100**
Г	Indicators 7 and 8	200	**244**
Д		100	**120**
E	Sum of all indicators 12-20	100	**130**

III. Critical remarks and recommendations

I have no remarks on the presented scientific papers and materials.

Assistant Professor Dr. Merhar is a well-established researcher, conducting detailed studies, with sustainable career development and original contributions to Biology.

IV. Conclusion

I believe that the career development of Assistant Professor Vesselina Merhar, PhD, her scientometric indicators, the contributions of her research activities fully comply with the requirements of the Law for Development of Academic Staff in the Republic of Bulgaria and in the Regulations of Burgas University "Prof. Dr. Assen Zlatarov " regarding the academic position "Associate Professor".

According to the materials presented to me in the competition, I find that the candidate Dr. Vesselina Merhar is a specialist with significant original, fundamental and practical applied scientific results and contributions.

For these reasons, I confidently give my positive assessment to Assistant Professor Dr. Vesselina Stoyanova Merhar and recommend to the members of the honorable Scientific Jury to support her selection for the academic position of "associate professor" in the scientific specialty "Cell Biology", in the field of higher education 4. Natural sciences, mathematics and informatics, professional area 4.3. Biological Sciences at the Department of "Biology, Medical Genetics, Microbiology", Faculty of Medicine, Burgas University "Prof. Dr. Assen Zlatarov".

Prepared by:

16.11.2022г. /Prof. Dr. Ivaylo Stefanov, PhD/