

## SCIENTIFIC STATEMENT

From: Assoc. Prof. Mariya Angelova Angelova, PhD  
Trakia University - Stara Zagora, Faculty of Medicine  
Department of Obstetrics and Gynecology

Regarding: the doctoral dissertation of Dr. Tsvetomir Evgeniev Kachovski  
on the topic:

"CORRELATION BETWEEN ULTRASOUND DIAGNOSTICS AND  
IMMUNOHISTOCHEMISTRY IN EARLY AND LATE SPONTANEOUS ABORTIONS"

For the acquisition of a PhD degree

### I. General information about the candidate

Dr. Tsvetomir Kachovski graduated in medicine in 2014 from Medical University - Pleven. He began his specialization in "Obstetrics and Gynecology" in 2015 at SBAGAL 'Prof. Dr. D. Stamatov' in Varna. From July 10, 2016, to January 20, 2020, he served as an honorary assistant at the Department of Obstetrics and Gynecology at MU-Varna.

In 2020, he obtained a specialization in "Obstetrics and Gynecology." Since 2020, he has been an assistant at the Department of Obstetrics and Gynecology at MU-Varna and a specialist doctor at SBAGAL 'Prof. Dr. D. Stamatov' in Varna, in the gynecology department.

He has completed numerous training and qualification courses in the field of obstetrics and gynecology both in the country and abroad.

Dr. Kachovski's dissertation contains 161 pages and is illustrated with 36 figures and 62 tables. It includes a reference to scientific contributions and a list of publications related to the topic of the work. The cited bibliography covers 305 literary sources, including 32 in Cyrillic and 273 in Latin. The dissertation is structured according to the approved requirements.

### II. Relevance of the topic

In his dissertation, Dr. Kachovski has developed a problem that is distinguished by its particular relevance worldwide and in Bulgaria. Despite significant advances in medicine, spontaneous abortions are still conditions in obstetrics associated with a high frequency.

The gold standard for the diagnosis of spontaneous abortions is ultrasound examination. Knowledge of ultrasound markers for early and late abortions is of utmost importance for timely diagnosis, which will lead to appropriate management during pregnancy. Early

diagnosis based on ultrasound, Doppler velocimetry of uterine arteries, and proper obstetric management are crucial for favorable outcomes in every pregnancy.

The combination of a proven diagnostic method such as ultrasound and immunohistochemistry allows for detailed examination of the causes of spontaneous abortions. The study of the proliferative marker Ki67 and CD56 allows for the determination of trophoblast development.

In the literature review, Dr. Kachovski has systematized and discussed current controversial opinions. The analysis of the literature clearly emphasizes the relevance of the issues discussed. The formulation of the objectives and tasks based on the conducted literature review is the basis for the interpretation of the obtained results.

The objectives and tasks are clearly formulated. The goal is to determine and find a correlation between Doppler velocimetry of uterine arteries and the amount of dNK and proliferative marker Ki-67, examined in placental tissue through immunohistochemical analysis, in early and late spontaneous abortions and elective abortions. There are 7 tasks formulated in the study.

In the "Materials and Methods" section, the main groups of the study material are specifically and accurately identified. The study has a retrospective and prospective nature. All subjects were treated at SBAGAL 'Prof. Dr. D. Stamatov' in Varna, in the Department of Gynecology, from October 2018 to January 2023. Anamnestic, clinical, imaging, pathoanatomical, and immunohistochemical methods were used.

The author clearly defines the inclusion and exclusion criteria, ensuring maximum reliability of the subsequent conclusions. The statistical analysis is based on primary data processing, statistical analysis, and graphical presentation. The section includes images of immunohistochemical staining of trophoblast from early and late abortions. Ultrasound and Doppler examination are also illustrated with a large number of figures.

The "Results" section is presented in 6 subsections corresponding to the objectives of the dissertation, which brings clarity to the presented data. Established normograms were used to analyze the obtained data. The results are summarized in simplified tables and graphs, illustrating the author's conclusions.

The discussion of the results is detailed and includes the distribution according to demographic indicators, the results of immunohistochemical analysis, and Doppler velocimetry. The discussion also includes a comparison of the author's findings with those of other international studies, highlighting the correlation between the author's results and the global literature.

In conclusion, Dr. Kachovski emphasizes the significance of the problem and proposes an algorithm for evaluating women at high risk of spontaneous abortion. This algorithm includes ultrasound diagnostics, Doppler examination, and immunohistochemical analysis of markers such as Ki67 and CD56.

Overall, the dissertation provides valuable insights into the topic and presents findings that contribute to the existing body of knowledge in this field.

Notes and Recommendations:

The bibliography covers 305 literary sources, demonstrating a wide overview of the research on the topic in the global literature. This serves as a solid basis for properly formulating the objectives and tasks of the scientific work, as well as interpreting the obtained results.

I believe that the following contributions with original character should be highlighted:

1. An original screening algorithm has been developed for pregnant women with Threatened Abortion.
2. For the first time in Bulgaria, a study of abortion materials was conducted using immunohistochemistry with the proliferative marker Ki67 and CD56+ in the first and second trimesters of pregnancy.
3. For the first time in Bulgaria, a study and analysis of spontaneous abortions was conducted using a combination of immunohistochemistry and Doppler velocimetry.

The remaining contributions mentioned by the author have a confirmatory character.

### III. Conclusion

The presented dissertation work by Dr. Tsvetomir Kachovski fulfills the criteria of a scientific work with clinical and practical orientation in terms of its development, execution methods, content, and presentation format.

The author's conclusions are well-presented and correspond to the assigned tasks and objectives.

The assessment is that the candidate has successfully accomplished the set tasks.

Overall, from the aforementioned points, it becomes evident that:

1. The stated objective and tasks of the examined problem have been successfully resolved.
2. The development, summarization, and conclusions in the dissertation work are both theoretically and practically useful.
3. The final outcome of the study is undoubtedly positive and represents a significant scientific and practical contribution.

The presented dissertation work on the topic "Correlation between Ultrasonographic Diagnosis and Immunohistochemistry in Early and Late Spontaneous Abortions" possesses the qualities of a dissertation-worthy scientific study, therefore I give my entirely positive evaluation.

I propose that the esteemed Academic Jury vote positively for awarding the educational and scientific degree of "Doctor" in the scientific specialty of "Obstetrics and Gynecology" to Dr. Tsvetomir Evgeniev Kachovski.

17.08.2023.

COMPILED THE SCIENTIFIC STATEMENT:.....

Assoc. Prof. Mariya Angelova Angelova, MD