

**TO THE CHAIRMAN OF THE SCIENTIFIC JURY,  
DETERMINED BY ORDER No. P-1185/20.02.2026  
OF THE RECTOR OF MU-PLOVDIV**

**REVIEW**

**By Prof. Nikolay Dimitrov Dimitrov, MD, PhD**

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Elected as a member of a scientific jury

**Subject:** The dissertation work for awarding the educational and scientific degree "Doctor of Philosophy", presented by the doctoral student **Dr. Zlatizara Hristova Todorova** on the topic " **Anthropological characteristics of facial skull and piriform aperture in the Bulgarian population of southern Bulgaria – measurement based on 3D reconstructions of computed tomography scans**" with the scientific supervisor of the doctoral student ssoc. Prof. Dr. Ferihan Ahmed-Popova, DMD, PhD and scientific consultant, Chief Assistant Prof. Irina Angelova-Dechevska, MD, PhD.

**General presentation of the procedure and the doctoral student**

By order No **P-1185/20.02.2026** of the Rector of the Medical University of Plovdiv (MU – Plovdiv), I was elected as a member of a scientific jury for the acquisition of the educational and scientific degree "Doctor of Philosophy" in the field of higher education 7. Health and sport in the professional direction 7.1 "Medicine "and scientific specialty "Anatomy, Histology and Cytology". The author of the dissertation work is **Dr. Zlatizara Hristova**, a doctoral student in the Department of "Anatomy, Histology and Embryology", at the MU – Plovdiv. The presented documents and materials correspond to the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for its Implementation and the Rules for the Development of the Academic Staff the Faculty of Medicine at the at the MU – Plovdiv.

The doctoral student **Dr. Zlatizara Hristova Todorova** was born on 03.07.1984. In 2009, she completed her higher education at the MU – Plovdiv with a master's degree in specialty

„Dental Medicine“. From 2021 until now, she has been a teacher, appointed to the position of "Assistant Professor" in the Department of "Anatomy, Histology and Embryology" at the MU – Plovdiv. She was enrolled as a doctoral student at the Department of "Anatomy, Histology and Embryology", at the MU – Plovdiv. She is a doctoral student at the Department of "Anatomy, Histology and Embryology", at the MU – Plovdiv, by order No P-3736 /25.07.2025. She has been addressed with the right of defence by order No. P- 637/29.01.2026 after successfully passing internal defence.

### **Validity of the topic**

The dissertation is devoted to a study aimed at validating the reliability of craniometric measurements performed on 3D reconstructions derived from computed tomography scans, as well as to determining the presence of sex-related differences among individuals from the contemporary Bulgarian population, with subsequent comparison to other populations. The anticipated outcomes will enhance the applicability of the obtained anthropological data across scientific disciplines such as anthropology and archaeology, as well as in clinical medical and dental specialties. The topic is current and of practical relevance.

### **State of the art**

The basic information presented in the introduction is based on modern scientific research. The creative use of the cited literary material shows an excellent knowledge of the state of the problem addressed in the dissertation by the doctoral student.

### **Characterization and evaluation of the dissertation work and contributions**

The presented dissertation covers 146 standard pages.

The visualization of the dissertation includes 24 tables and 57 figures in the text of the dissertation.

**The literature review** corresponds with the scientific problem. It is saturated, rich, and in-depth with data; it includes 269 sources, 21 of which are in Cyrillic.

**The aim and tasks** of doctoral work are defined adequately and competently.

**The material** of the study is sufficient as a volume, correctly selected, documented and registered, which guarantees credibility. This study includes 120 conventional computed tomography scans of individuals of Bulgarian ethnic origin (55 men and 65 women) aged 20 to 60 years. All participants were referred to their treating physician for head computed tomography for objective clinical reasons and signed an informed consent form allowing their

data, obtained through the relevant imaging diagnostic method, to be used in this dissertation. Most of the subjects were from the same area – Plovdiv region, Southern Bulgaria. The study group consists of a random sample of adult patients who were consecutively admitted for outpatient or inpatient treatment at the Medical Complex St. Ivan Rilski, Department of Diagnostic Imaging, Plovdiv. Due to the presence of sexual dimorphism in the studied anthropological indicators, the study participants were divided by gender. In accordance with the Helsinki Convention on Human Rights, all participants were informed in advance of the aims, objectives and the procedure of the study and gave their written informed consent to participate in the study in the presence of a witness. The study was conducted after approval by the Scientific Ethics Committee of the Medical University of Plovdiv.

### **Methodology of the study.**

The doctoral student has used methods that are sufficient and reliable to reach the intended goal. The study was conducted using a third-generation Siemens SOMATOM Sensation Cardiac 64 Multi-Slice Computed Tomography (MSCT) Scanner – a multi-detector, spiral 64-slice computed tomography scanner. The images were obtained in DICOM format and, using the 3D VR (Volume Rendering) tool of the Radiant DICOM Viewer software, a three-dimensional reconstructed model of the skull and lower jaw was visualized on which craniometric points were placed and linear parameters were measured.

The material was statistically processed with the SPSS 24.0 computer program (Statistical Package for the Social Sciences 24.0), using the following analyses:

- Descriptive statistics: Mean, standard deviation, minimum-maximum, median, percentiles, confidence interval, relative share.
- Graphical analysis.
- Non-parametric analyses:  $\chi$  test, Fisher's Exact Test.
- Parametric analyses: Student's t-test (two-tailed), correlation analysis (calculation of Pearson's correlation coefficient)
- Multivariate analyses: discriminant analysis.

**Results and discussion.** Obtained results are thoroughly analyzed and demonstrated in the delivered documentation. They were subjected to statistical analysis and raised in the form of a sufficient number of figures and tables.

**The conclusions** are six and they correctly summarize the study's results.

**Assessment of the publications and personal contributions of the doctoral student**

The contributions confirm the significance of the presented dissertation. Two original contributions, two theoretical–methodological contributions, and two contributions of a scientific–applied nature are identified.

A detailed anthropological characterization of the *apertura piriformis* and the facial skeleton in individuals from Southern Bulgaria has been performed, incorporating—at a national level for the first time—data obtained through three-dimensional reconstructions from computed tomography. This approach expands the existing anthropometric database in Bulgaria with high-precision imaging data.

For the first time in Bulgaria, an evaluation of the *apertura piriformis* as an indicator for sex determination has been conducted, based on 3D reconstructions from computed tomography scans. This innovative methodology introduces a new criterion for sexual differentiation and contributes to the advancement of forensic anthropological and morphological analyses in the country.

The main results are published in four papers, all of which the PhD student is the lead author. The doctoral student also has four participations in scientific forums.

**The dissertation abstract** is structured correctly and reflects the main content, results, and contributions of the dissertation.

**My personal recommendations** are for future use of the findings and results and their application in the field of clinical and forensic medical practice.

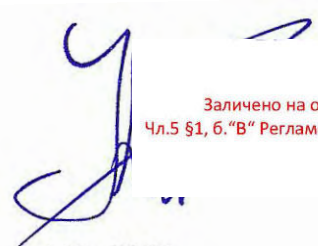
### **Conclusion**

Based on the above convincingly, I give my positive assessment of the scientific study in the dissertation. I, therefore, propose to the Honored Scientific Jury to confer on **Dr. Zlatizara Hristova Todorova** the educational and scientific degree "Doctor of Philosophy" in the field of higher education 7. Health and sport in the professional direction 7.1 "Medicine" and scientific specialty "Anatomy, Histology and Cytology".

25.03. 2026

Member of the Scientific Jury:

( *Prof. Nikolay Dimitrov Dimitrov, MD, PhD* )



Заличено на основание  
Чл.5 §1, б. "В" Регламент (ЕС)2016/679