To the Scientific Jury appointed by
Order No. 15-03-96#2 / 16 April 2026
of the Executive Director
Dr. Venelina F. Atanasova
and the Procurator
Mr. Bugra Susam
of Acibadem City Clinic University
Hospital Tokuda
Sofia

OPINION

on the doctoral dissertation entitled:

"The Role of GDF-15 as a Prognostic Marker for Diabetic Cardiomyopathy in Patients with Type 2 Diabetes Mellitus and Diabetic Kidney Disease"

concerning the dissertation of

Dr. Desislava Ivanova Gorcheva

submitted for the award of the educational and scientific degree of Doctor (PhD) in the field of higher education 7. Healthcare and Sports, professional field 7.1. Medicine, doctoral programme in Internal Medicine, as an independent doctoral candidate at the Clinic of Internal Medicine of Acibadem City Clinic University Hospital Tokuda.

Scientific Supervisor:
Assoc. Prof. Dr. Lachezar Boyanov Lozanov, MD, PhD

Prepared by:
Assoc. Prof. Dr. Plamen Radoev Popivanov, MD, PhD
External Member of the Scientific Jury

Head of the Department of Clinical Densitometry and Metabolic Bone Diseases at Alexandrovska University Hospital

Specialist in Endocrinology and Metabolic Diseases and in Internal Medicine

"Sv. Georgi Sofiyski" St.1,
1431 Sofia, Bulgaria
E-mail: ppopivanov@abv.bg

GENERAL PRESENTATION OF THE DOCTORAL CANDIDATE

Submitted Documentation

All required documents have been duly submitted.

Biography

Dr. Desislava Gorcheva was born in 1970. She obtained her Master's degree in Medicine with distinction in 1994 and subsequently acquired specialties in Internal Medicine (1999) and Endocrinology and Metabolic Diseases (2005). Since 2006, she has been working at Acibadem City Clinic University Hospital Tokuda in the Clinic of Internal Medicine – Department of Endocrinology and Metabolic Diseases, and since 2021 she has served as Head of the Department.

In 2023, she was enrolled as a doctoral candidate, and on 9 April 2026 she was deregistered with the right to defend her dissertation thesis.

Publications Related to the Dissertation

The doctoral candidate has authored two original scientific publications, presented two posters at international scientific congresses, and delivered two reports at national scientific forums.

Additional Information

The doctoral candidate is fluent in English and Russian.
She is a member of the Bulgarian Medical Association, the Bulgarian Society of Endocrinology, the Bulgarian Diabetes Association, and the Bulgarian Association for the Study and Prevention of Obesity.
She is also the author of numerous scientific publications.

Conclusion

The doctoral candidate has fulfilled all training requirements and has successfully passed the examinations stipulated in the individual study plan.

The candidate's qualifications, clinical experience, specialized training, and scientometric indicators demonstrate her preparedness and competence for conducting the present research work and fully satisfy the procedural requirements for the defense of a doctoral dissertation.

DISSERTATION THESIS

Dissertation Topic

The topic of the dissertation is highly relevant to contemporary clinical practice and has been the subject of intensive investigation by the international scientific community in recent years.

Unfortunately, in Bulgaria this issue remains underestimated and insufficiently studied, while practical guidelines for clinical medicine are still lacking.

Knowledge of the Problem and Personal Contribution of the Doctoral Candidate

Dr. Desislava Gorcheva demonstrates excellent knowledge of the dissertation topic, having worked in the field of endocrinology since 2005.

The patients included in the study and the investigations performed constitute her own personal contribution. The echocardiographic and laboratory investigations were carried out in collaboration with the respective specialists.

Technical Characteristics

The dissertation comprises 158 pages and includes 29 tables and 31 figures.

The bibliography comprises 203 references, of which 5 are in Cyrillic and 198 in Latin script. Their selection clearly demonstrates Dr. Desislava Gorcheva's ability to critically evaluate and select relevant international scientific evidence. The number of cited Bulgarian authors is limited, as the subject of the dissertation has not been sufficiently investigated in Bulgaria.

The structure of the dissertation, the scope of its individual sections, and the bibliography comply with the established academic standards.

The literature review extends over 45 pages and is focused on the core issues addressed in the dissertation. It is comprehensive, precise, critical, and analytical in nature. The analysis identifies the unresolved issues that provide the rationale and scientific justification for the dissertation research..

Aim and Objectives. Materials and Methods

The aims and objectives of the study are clearly defined and specific.

In order to improve the clinical approach, recommendations have been formulated for a diagnostic and prognostic algorithm incorporating GDF-15 for the early diagnosis of diabetic cardiomyopathy according to the degree of renal impairment.

A single-center cohort study was conducted.
Participants were enrolled voluntarily after signing informed consent forms.

The methods applied included anamnestic, clinical, anthropometric, imaging, laboratory, and ultrasonographic assessments.

Statistical analysis was performed using SPSS version 22. Both descriptive and analytical statistical methods were employed. The statistical methodology is appropriate and adequately corresponds to the objectives of the study.

Results and Discussion

The results and discussion are presented over 59 pages and are organized into 26 tables and 20 figures. The statistical analysis is precise and aimed at homogenizing a highly heterogeneous population.

In the discussion, the results are analyzed and systematized with a high level of professional competence, both clinical and theoretical.

The limitations of the applied methodologies, as well as the somewhat contradictory findings of studies with similar design, are critically presented.

Overall, the results and discussion provide a substantial and highly significant body of evidence contributing to the understanding of the importance of GDF-15 in the early diagnosis of diabetic cardiomyopathy.

Conclusion and Conclusions (Findings)

The conclusions of the dissertation are logically well-founded, deriving directly from the aim and objectives of the study as well as from the convincing results obtained from the conducted research.

Abstract

The abstract comprises 55 pages, 27 tables, and 18 figures. It adequately presents the dissertation work and meets the required academic standards.

Assessment of the Candidate's Contributions

Original Contribution

In her dissertation, Dr. Desislava Gorcheva investigates, for the first time in Bulgaria, the role of the biomarker GDF-15 in the early diagnosis, risk stratification, and prognosis of diabetic complications in patients with type 2 diabetes mellitus, including diabetic cardiomyopathy and diabetic kidney disease.

She demonstrates that the combination of albuminuria and elevated GDF-15 levels represents an early/subclinical predictor of cardiorenal dysfunction

Confirmatory Contribution

The dissertation confirms the importance of GDF-15 as an integrative biomarker of systemic stress and multi-organ injury, including myocardial, renal, endothelial, and inflammatory damage.

Contributions of Scientific and Applied Significance

The study proposes a novel diagnostic and prognostic clinical algorithm for early risk stratification of diabetic cardiomyopathy in patients with type 2 diabetes mellitus. This approach enhances existing clinical algorithms by incorporating a new, powerful, independent, and integrative non-metabolic predictor—GDF-15.

Recommendations and Remarks

The dissertation is rich in material. It would be appropriate for its various aspects to be further developed in separate scientific publications, as well as in a monograph entitled *"Diabetic Heart"*.

Conclusion

The doctoral candidate has complied with all deadlines, fulfilled all required procedures, conditions, and obligations, and has submitted all necessary documentation. Overall, she meets the national requirements as well as those of Acibadem City Clinic University Hospital Tokuda for the award of the educational and scientific degree of Doctor (PhD).

The dissertation has been developed in depth, demonstrates personal familiarity with the research problem, and is well illustrated. It is written in clear Bulgarian language. It proves that the candidate possesses the theoretical knowledge and professional skills necessary for independent scientific research.

The dissertation contains original as well as confirmatory scientific contributions—of theoretical, applied, and methodological significance—and fully meets all requirements of the Bulgarian Law on the Development of the Academic Staff in the Republic of Bulgaria and the accompanying regulations, as well as the internal standards of Acibadem City Clinic University Hospital Tokuda for the award of the educational and scientific degree "Doctor (PhD)".

Based on all the above, I hereby give a **positive evaluation** of the dissertation entitled *"The Role of GDF-15 as a Prognostic Marker for Diabetic Cardiomyopathy in Patients with Type 2 Diabetes Mellitus and Diabetic Kidney Disease"* and propose to the esteemed Scientific Jury (appointed by Order No. 15-03-96#2 / 16.04.2026 of the Executive Director and the Procurator of Acibadem City Clinic University Hospital Tokuda) to award the educational and scientific degree **Doctor (PhD)** in the field of higher education 7. **Healthcare and Sports**,

professional field 7.1. **Medicine**, doctoral programme **Internal Medicine**, to the doctoral candidate in independent training at the Clinic of Internal Medicine, **Dr. Desislava Gorcheva,** under the supervision of Assoc. Prof. Dr. Lachezar Boyanov Lozanov, MD, PhD.

26.05.2026, Sofia

Member of the Scientific Jury:
Assoc. Prof. Dr. Plamen Popivanov, MD, PhD