TO

THE HEAD OF THE SCIENTIFIC JURY,

ASSIGNED BY THE ORDER № P-109-148/13.03.2025

OF THE RECTOR OF THE MEDICAL UNIVERSITY

"PROF. D-R PARASKEV STOYANOV - VARNA,

PROF. DIMITAR RAIKOV, MD, PhD, DSc

Please, find attached: An Opinion Statement on the PhD dissertation for obtaining the educational and scientific degree „Doctor" in the Scientific specialty "Hematology and blood transfusion" on the topic "ROLE OF SELECTED PLASMA MICRORNAS AS DIAGNOSTIC AND PROGNOSTIC BIOMARKERS IN MYELODYSPLASTIC SYNDROME" from SVILENA ANGELOVA ATANASOVA, MD, a full-time PhD student in the area of education: "7. Healthcare and Sports", professional field "7.1. Medicine" in Medical University - Varna, Faculty of Medicine, Second Department of Internal Medicine, ES Hematology, dismissed with the right to defend her dissertation with an order № P-109-303/16.07.2021 of the Rector of Medical University – Varna.

Reviewer: Prof. Gueorgui Nikolaevitch Balatzenko, MD, PhD

Scientific specialty: 03.01.39 - Hematology and Blood Transfusion

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OPINION STATEMENT

From Prof. Gueorgui Balatzenko, MD, PhD,

Head of the Laboratory of Medical Genetics,

Specialized Hospital for Active Treatment of Hematological Diseases, Sofia

Regarding the PhD dissertation for obtaining the educational and scientific degree "Doctor" in the scientific specialty "Hematology and blood transfusion" on the topic **"ROLE OF SELECTED PLASMA MICRORNAS AS DIAGNOSTIC AND PROGNOSTIC BIOMARKERS IN MYELODYSPLASTIC SYNDROME"** from SVILENA ANGELOVA ATANASOVA, MD, a full-time PhD student in the area of education "7. Healthcare and Sports," professional field "7.1. Medicine" in Medical University - Varna, Faculty of Medicine, Second Department of Internal Medicine, ES Hematology, dismissed with the right to defend her dissertation with an order № P-109-303/16.07.2021 of the Rector of Medical University – Varna.

RELEVANCE OF THE PROBLEM

Myelodysplastic syndromes (MDS) are a heterogeneous group of clonal diseases characterized by dysplasia, ineffective hematopoiesis in the bone marrow, cytopenias in the peripheral blood, and a considerable risk of transformation to acute myeloid leukemia, with the median survival of MDS patients varying widely. The onset, progression, and overall prognosis of the diseases are associated with complex interactions between the presenting genetic abnormalities affecting whole chromosomes, parts of chromosomes, or individual genes, and the various epigenetic disorders. Despite the progress made in recent years, MDS continues to be a challenge in daily practice, both in terms of diagnosis and treatment, due to the heterogeneity of the diseases, variations in the underlying biological disorders, their clinical manifestation, and laboratory alterations. All this determines the necessity of applying a complex multidisciplinary approach using a diverse spectrum of morphological, immunological, cytogenetic, and molecular studies. To successfully overcome these challenges in MDS, new biomarkers with prognostic and predictive significance, a personalized approach to the treatment of individual patients, and the development of novel therapeutic strategies that improve long-term prognosis are needed. In recent years, several studies have outlined the clinical relevance of post-transcriptional control of gene expression in MDS mediated by microRNAs (miRNAs). These small non-coding RNA molecules bind to the 3'-untranslated regions of target messenger RNAs (mRNAs) and lead to translation repression or mRNA degradation. Altered expression of miRNAs is discussed in the context of MDS pathogenesis and progression and as potential prognostic factors in the disease. In this regard, studies on miRNAs in MDS are undeniably relevant and of marked theoretical and practical relevance.

BRIEF INFORMATION FOR THE PROFESSIONAL DEVELOPMENT OF THE DOCTORAL STUDENT

Dr. SVILENA ATANASOVA received her master's degree (Diploma № 005825/01.11.2018) from "Prof. D-r. Paraskev Stoyanov Medical University" in Varna in 2018. She was a trainee in clinical

hematology from October 16, 2018, to December 31, 2018, at the Clinic of Hematology of "Sveta Marina" University Hospital in Varna. She successfully passed the state exam and received her board certification in "Clinical Hematology." After that, and on January 1, 2025, she was reassigned as a hematologist to the same medical institution, where she is currently employed. During the period 11/02/2019 - 23/05/2019, Dr. SVILENA ATANASOVA was a part-time assistant professor in hematology at the Medical University - Varna, and from 23/10/2019 and currently, she is a full-time assistant professor at the same institution. From the beginning of 2020, by order № P-109-70/31.01.2020 of the Rector of MU-Varna, she was enrolled as a full-time PhD student at the 'Prof. Dr. Paraskev Stoyanov Medical University – Varna, Faculty of Medicine, Second Department of Internal Disease, ES Hematology, for the development of PhD Thesis entitled "ROLE OF SELECTED PLASMA MICRORNAS AS DIAGNOSTIC AND PROGNOSTIC BIOMARKERS IN MYELO-DYSPLASTIC SYNDROME" with a scientific supervisor Prof. Dr. Elina Micheva, MD, PhD, in Scientific specialty "Hematology and Blood Transfusion" in the field of higher education "7. Healthcare and Sports", professional field "7.1. Medicine". By order of the Rector of MU - Varna № R-109-148/ 13.03.2025, Dr. SVILENA ATANASOVA was dismissed with the right to defend her dissertation. She is a member of the Bulgarian Medical Association of Hematology and the European Hematology Association.

STRUCTURE AND LAYOUT OF THE DISSERTATION

The dissertation is prepared according to the regulatory requirements and contains 176 standard pages, illustrated with thirty-nine figures and twelve tables. The dissertation includes the generally accepted sections distributed as follows: Title pages [2 pages (pp.) (#1-2)]; Table of contents [3 pp. (#3-5)]; Abbreviations used [4 pp. (#6-9)]; Introduction [2 pp. (#10-11)]; Exposition: I. Literature review [45 pp. (#12-57)]; II. Aim and objectives [2 pp. (#58-59)]; III. Materials and methods [7 pp. (#60-66)]; IV. Own results of the study [59 pp. (#67-115)]; V. Discussion and conclusions [21 pp. (#116-136); VI. Contributions [1 p. (#137)]; VII. Scientific publications on the topic [1 p. (#138)]; VIII. Acknowledgments [1 p. (#139)]; IX. References (22 p. (#140-176)]. The bibliography comprises 290 Latin-language sources, with 14.8% (n=43) of the cited works published in the last 5 years. The PhD abstract contains 124 standard pages and corresponds to the contents of the thesis.

The **LITERATURE REVIEW** is thorough and reflects the profound knowledge of DR. SVILENA ATANASOVA on the problems of the dissertation. The typical characteristics, principles, and approaches to the diagnosis and classification of MDS are presented in the light of the latest World Health Organization (WHO) classification (2022). The risk stratification of diseases according to the International Prognostic Scale (IPSS), its revised version (R-IPSS), and the molecular IPSS (IPSS-M), as well as the principles of MDS treatment, are discussed. The current concepts of the pathogenesis of MDS and the broad spectrum of genetic disorders affecting the structure and/or number of chromosomes, as well as abnormalities affecting the structure and/or function of individual genes, are presented in detail. The epigenetic mechanisms of gene expression regulation (DNA methylation, post-translational modification of histone proteins, chromatin remodeling, and non-coding RNA synthesis) and the involvement of their disorders in the pathogenesis of MDS are thoroughly reviewed. Particular attention is paid to the role of miRNAs as a key element of physiological epigenetic regulation and the mechanisms by which they contribute to oncogenesis, providing detailed information on the different miRNAs, the potential benefits of their study, both for the assessment of the clinical course and overall prognosis, and their importance for the

development of resistance, assessment of therapeutic response and as therapeutic targets. At the same time, despite the growing interest in miRNAs as potential biomarkers in MDS, their functional role and clinical applications are not fully understood.

The **AIM** of this dissertation is clearly stated and specific "To evaluate the expression levels of 5 selected miRNAs - miRNA-22, miRNA-144, miRNA-16, miRNA-451a, Let7a, in patients with MDS, to perform a comparative analysis of the results in the high and low-risk MDS groups and between patients with MDS and healthy controls, and to determine their prognostic significance".

To achieve this goal, nine **OBJECTIVES** were formulated: (1) To select a group of patients with MDS by determining their demographic and clinic-laboratory characteristics and a control group of healthy controls with similar demographic characteristics to those of the patient group; (2) To investigate the expression levels of selected 5 miRNAs in both groups; (3) To compare the levels of the miRNAs studied between the MDS patients and healthy controls; (4) To analyze the levels of miRNAs in patients against demographic characteristics; (5) To analyze the levels of miRNAs tested in different subtypes of MDS and according to the risk stratification of patients by the R-IPSS scale; (6) To conduct a correlation analysis of the relationships between the studied miRNAs and different hematological and biochemical parameters in MDS patients; (7) To determine the diagnostic value of the studied miRNAs; (8) To evaluate the predictive role of the tested miRNAs for distinguishing between high and low risk MDS according to R-IPSS and for different types of MDS; (9) To determine the predictive value of the tested plasma miRNAs in MDS.

MATERIALS AND METHODS – Forty adult patients with proven MDS and ten healthy controls were enrolled in the study, conducted at the Clinical Hematology Clinic at St. Marina University Hospital - Varna. For the thesis, in the patients and healthy controls, in addition to the clinical examination and routine laboratory tests (peripheral blood counts, LDH, beta2-microglobulin, ferritin, and erythropoietin), a molecular analysis was performed to determine five miRNAs - miRNA-22, miRNA-144, miRNA-16, Let-7a and miRNA-451a, using counter-roles microRNA C. elegans miR-39. For this purpose, miRNAs isolated from blood plasma were subjected to reverse transcription, then amplified by quantitative real-time polymerase chain reaction [PCR] using a ready set and primers for the target microRNAs. The analysis was performed on QuantStudio Dx (Applied Biosystems, USA), the threshold cycle (Ct) was reported for each sample, and the relative expression of the target miRNAs was determined by the ΔΔCt method relative to a C. elegans miR-39 reference microRNA. The wide range of statistical approaches used was adequate for the objectives of the study and included specialized statistical processing software (IBM SPSS Statistics v.24, GraphPad Prism, version 10.4.1, Python v.3 .8 and Google Sheets) and a wide range of methods: descriptive statistics; Shapiro-Wilk test; Mann-Whitney test; Spearman correlation coefficient; regression analyses; ROC analysis; Kaplan-Meier curves, etc.

The **RESULTS** obtained align with the assigned objectives and are properly presented and illustrated with numerous figures, graphs, and tables. The selected group included 40 MDS patients, fifteen males and twenty-five females, with a median age of 71 (41-88) years, as well as a control group of ten healthy individuals with similar demographic characteristics. According to the WHO classification (2016), 47.5% of the patients had MDS with multilineage dysplasia, 32.5% had MDS with an excess of blasts, and 10% each had MDS with ring side oblasts and MDS with del(5q). The risk stratification of patients according to R-IPSS and according to the number of cytopenias detected, as well as their distribution according to the number of blasts in the bone marrow, is presented. Of the MDS group, 7.5% were on active surveillance, 32.5% on substitution

therapy, 25% on therapy to increase hemoglobin level, and 35% on therapy to reduce bone marrow blasts. Median overall survival was reached at 35 months. The expression levels of the five miRNAs studied were examined in MDS patients and healthy subjects, and for four of the miRNAs, a significantly lower median expression was found in MDS, respectively: miRNA-144 (0. 802 vs. 1.933); miRNA-16 (0.7855 vs. 1.76); Let-7a (0.692 vs. 1.669) and miRNA-451a (0.8215 vs. 2.132), whereas the levels of miRNA-22 in the two groups did not differ significantly. Optical threshold values were also determined for the four miRNAs with significant differences between patients and healthy controls, allowing their differentiation, respectively: miRNA-144 (1.727); miRNA-16 (1.508); Let-7a (0.9775), and miRNA-451a (1.161). The levels of miRNAs in the patients were analyzed against the demographic parameters, and no significant differences associated with sex were found; concerning age, the only significant correlation was found for Let-7a, the levels of which decreased with increasing age. The miRNA levels were examined in MDS patients with multilineage dysplasia, ring sideroblasts, and del(5q) versus those with MDS with an increased percentage of blasts, and significant differences were found only concerning Let-7a, whose level was significantly higher in MDS with an increased percentage of blasts compared to the others. The level of miRNAs according to the IPSS risk stratification was also compared in low-risk (including very low, low, and intermediate risk $\leq$3.5 points) and high-risk (including intermediate >3.5 points, high, and very high risk) patients, showing that the levels of Let-7a and miRNA-451a were significantly lower in low-risk patients compared with high-risk patients. The expression of miRNAs was also analyzed according to cytogenetic risk, and only patients with intermediate and good cytogenetic risk were included in the analysis, as the number of patients with very good, poor, and very poor risk did not allow reliable statistical evaluation. Significant differences were found for miRNA-144 and miRNA-451a, both of which had higher levels in the low-risk group. The correlation between the levels of the secreted miRNAs with each other as well as with different laboratory parameters in MDS patients was investigated. Significant positive correlations were found in all miRNAs studied - between Let-7a and the other 4 miRNAs and between the pairs: microRNA-22/miRNA-144; miRNA-16/miRNA-451a; miRNA-144/miRNA-451a; and miRNA-16/miRNA-144, indicating that an increase in the levels of one miRNA is associated with an increase in the levels of others. When the levels of miRNAs were correlated with some laboratory parameters, several significant associations were found: miRNA-22 with LDH and erythropoietin levels; miRNA-144 with LDH and ferritin levels; miRNA-16 with ferritin levels; Let-7a with LDH; miRNA-451a with ferritin, as well as a significant, positive, correlation between Let-7a levels and the percentage of blasts in the bone marrow. Logistic regression analysis was performed to assess the association between the four miRNAs with a demonstrated significant difference between MDS patients and healthy controls (miRNA-16, miRNA-451a, miRNA-144, and Let-7a) and the probability of belonging to the MDS group. All four miRNAs were found to have significant relationships, and for each, higher levels correlated with a reduced likelihood of having MDS. In addition, based on Pseudo-R^2 values indicating how well the model explains variation in the dependent variable for each of the miRNAs, the highest Pseudo-R^2 was reported for miRNA-451a, followed by miRNA-16, miRNA-144, and Let-7a. Also, based on the Chi-square test to assess the statistical significance of the model, the highest value was found for miRNA-451a (19.4), indicating a highly significant relationship, followed by miRNA-16 and miRNA-144 (11.88 and 11.37, respectively), confirming the significance of the models for these miRNAs. For Let-7a, the value is lower (8.953), but also significant, although with a weaker value compared to the others. The predictive significance of the miRNAs studied was investigated by applying a LASSO analysis, which allowed identification of the most significant predictors by reducing the

coefficients of the less associated miRNAs, with the most significant regression coefficients reported for miRNA-22 (0. 260) and miRNA-451a (-0.362), indicating that higher levels of miRNA-22 were associated with a higher probability of MDS group membership, whereas higher levels of miRNA-451a correlated with reduced odds of MDS membership. The remaining miRNAs showed a weaker association with group membership. The possible predictive role of miRNAs in differentiating high-risk from low-risk MDS according to R-IPSS was investigated, and the initial analysis found significant differences in Let-7a and miRNA-451a between the two groups. Through LASSO analysis, it was confirmed that higher levels of Let-7a increased the probability of belonging to the high-risk group, whereas, for the remaining miRNA-22, miRNA-144, miRNA-16, and miRNA-451a, the data showed different trends and wide confidence intervals. The potential predictive value of Let-7a in risk stratification in MDS is supported by data from the additional univariate logistic regression analysis, providing additional arguments that higher Let-7a levels increase the chance of belonging to the high-risk group. The predictive value of miRNAs was analyzed concerning the different types of MDS, and because of the small number of patients, they were divided into 2 groups: MDS with low blast rates (MDS with multilineage dysplasia, MDS with ring sideroblasts, and MDS with del(5q); and MDS with high blast percentage (RAEB I and II). It was found by LASSO analysis that only Let-7a had a significant predictive role, suggesting that higher Let-7a levels were associated with a higher likelihood of belonging to the high percentage blast group. In addition, a univariate logistic regression analysis was performed to confirm the independent predictive role of Let-7a in distinguishing between low- and high-grade blasts in MDS patients. The prognostic significance of each of the miRNAs studied was also examined about the survival of MDS patients, and in none of them did the level correlate with a statistically significant risk of an event, despite some of them demonstrating hazard ratios (HR) >1. A combined model including miRNA-144 and miRNA-16 was also analyzed for their joint predictive value on survival of MDS patients, but again, no statistical significance was demonstrated, and the addition of these two miRNAs did not improve the predictive value of the model.

In the **DISCUSSION**, the results are discussed in the context of the complex disorders involved in the pathogenesis of MDS, including chromosomal aberrations, somatic mutations, and epigenetic disorders, among which miRNAs occupy a key place. The main focus of the discussion is on the differences in the expression of miRNAs miRNA-22, miRNA-144, miRNA-16, miRNA-451a, and Let-7a in MDS and in healthy subjects, and the correlations between the detected levels with clinical and laboratory characteristics of patients to allow a better understanding of their importance as diagnostic and prognostic biomarkers. The correlations associated with miRNA levels found were compared with data from other similar studies. Methodological differences between publications are highlighted, including variations in the number of patients studied, the heterogeneity of the MDS groups studied in terms of the relative proportion of individual subtypes and the distribution according to risk stratification, possible geographical and ethnic differences between the populations studied, variations in the type of diagnostic approaches used to assess miRNA levels (NanoString vs RT-qPCR), the type of biological material from which the miRNAs were isolated (plasma vs CD34+ bone marrow stem cells), etc. These variations may explain some conflicting results and highlight the necessity of conducting studies with larger cohorts of patients. The analyses presented here reveal biological processes and mechanisms by which miRNAs contribute to both the onset and progression of MDS, and the specific associations of the miRNAs studied with certain clinical features and laboratory parameters. We also highlight the role of different statistical approaches in processing the obtained results in building hypotheses and

allowing the identification of different miRNAs as key elements in the diagnostic model with high accuracy and robustness. It is concluded that the present study expands the knowledge of the role of miRNAs as diagnostic and prognostic biomarkers in MDS, which complement traditional diagnostic methods and provides new opportunities to improve the diagnosis, prognosis, and individualization of therapeutic strategies in this heterogeneous disease.

The **CONCLUSIONS** in the dissertation are derived from the results obtained and correspond to the set tasks: (1) Patients with MDS have significantly lower levels of miRNA-451a, miR-144, miRNA-16, and Let-7a compared to healthy controls; (2) Increased Let-7a levels are associated with higher bone marrow blast rates and higher risk according to R-IPSS; (3) Lower levels of miRNA-144 and miRNA-451a are associated with intermediary cytogenetic risk in patients with MDS; (4) levels of miRNA-22, miRNA-144 and Let-7a demonstrated a moderate positive correlation with LDH, reflecting their role in cellular metabolism and apoptosis; (5) high levels of miRNA-144, miRNA-16 and miRNA-451a correlated with elevated ferritin levels, suggesting their association with iron metabolism; (6) miRNA-22 and miRNA-451a were identified as the strongest biomarkers in a diagnostic model.

SCIENTIFIC CONTRIBUTIONS

Based on the obtained results, 7 scientific contributions of Dr. SVILENA ATANASOVA are formulated: (1) For the first time in Bulgaria, a study of plasma miRNAs (miRNA-16, miRNA-144, miRNA-22, miRNA-451a and Let-7a) in patients with MDS was conducted, which complements the traditional diagnostic methods and provides the opportunity for new perspectives in the evaluation of the disease; (2) For the first time, the relationship between the levels of specific miRNAs (miRNA-16, miRNA-144, miRNA-451a, etc.) was analyzed and key biochemical parameters (ferritin, erythropoietin, LDH) reflecting erythropoiesis and iron metabolism in MDS. These correlations highlight the potential of miRNAs to provide additional information on pathological processes in bone marrow; (3) For the first time, an integrated statistical approach (univariate and multivariate logistic regression, LASSO analysis, ROC analysis) was applied to assess both the individual and combined predictive value of the miRNAs studied for diagnosis and risk stratification in MDS; (4) The levels of miRNA-16, miRNA-144, miRNA-451a and Let-7a were confirmed to be significantly lower in MDS patients compared to healthy controls, which is consistent with international data on their role as potential diagnostic markers; (5) Let-7a was confirmed to correlate with blast rates and R-IPSS risk, supporting literature evidence on its role in MDS progression and its potential role in risk stratification; (6) A diagnostic model based on LASSO regression and combining several miRNAs (miR-22 and miR-451a) was developed, which showed extremely high sensitivity and specificity in discriminating MDS patients from healthy controls; (7) The potential non-invasiveness of plasma miRNAs highlights their role as a complementary tool to standard diagnostic methods (morphological assessment, cytogenetics, molecular tests), especially in cases with difficult histopathological evaluation.

I accept all seven contributions without any remarks.

ARTICLES RELATED TO THE DISSERTATION

The attached list of scientific papers related to the dissertation includes three publications, including three literature reviews, one of which was published in a high Impact Factor international

journal [Frontiers in Oncology, 14, 2024 - IF 3.5 (2023)]. On two of the papers the PhD student is the first author and on one - co-author:

1. Micheva ID & Atanasova SA. MicroRNA dysregulation in myelodysplastic syndromes: implications for diagnosis, prognosis, and therapeutic response. Frontiers in oncology, 2024; 14:1410656 - Indexed in PubMed, PubMed Central (PMC), Scopus, Web of Science, Science Citation Index Expanded (SCIE) databases. Number of points 60 / Number of authors 2 - Individual score: 30 points.

2. Atanasova S, Micheva I. "Epigenetic mechanisms in myelodysplastic syndrome." Medical Review.2022; 58(6) - indexed in Web of Science (2007-) (CABI) database - Number of points 60 / Number of authors 2 - Individual score: 30 points.

3. Atanasova S, Micheva I. Methylation disorders in myelodysplastic syndrome - therapeutic options. MEDINFO. 2022; 4:76-79 - Not indexed in world scientific databases - Number of points 30 / Number of authors 2 - Individual score: 15 points.

Besides, some of the results obtained have been presented in an original article, where DR SVILENA ATANASOVA is a co-author:

1. Micheva I. & Atanasova S. Diagnostic Potential of miR 451a in Myelodysplastic Syndromes. Scripta Scientifica Medica, 2025;57(2). https://doi.org/10.14748/775sfj75. This article received approval for publication after the submission of the documentation related to the dissertation defense, and therefore, it is not part of the attached publications.

According to the Regulations for the implementation of the Law on the development of academic staff in the Republic of Bulgaria, obtaining the educational and scientific degree "Doctor" requires a minimum of 30 points in group of indicators D (from 5 to 9); DR. SVILENA ATANASOVA'S total individual score is 75 points.

CRITICAL REMARKS

1. The number of MDS patients studied was small (n=40), and given the heterogeneity of the group, a sizable proportion of the analyses showed significant trends, but no statistical relevance of the correlations found.

2. The objective of measuring the levels of the different miRNAs was to test the possibility of using some of these miRNAs as diagnostic biomarkers due to the notable differences in miRNA expression between MDS patients and healthy individuals. However, the current classification determines the diagnostic criteria for the various MDS subtypes, and miRNA levels are not one of these criteria. Although the patterns of miRNA levels shown may be clinically relevant, they are not diagnostically significant because miRNA levels in MDS may be comparable to those in other disorders.

3. The Materials and Methods section contains descriptions of the statistical techniques that were employed; however, an explanation of some of these approaches is also included in the results section.

4. Task 2: "To investigate the expression levels of the selected 5 miRNAs in the two groups," and Task 3: "To compare the levels of the investigated miRNAs between MDS patients and healthy controls," are two separate but related tasks that ought to have been consolidated into one.

CONCLUSION

Based on the above, I believe that, regardless of the critical remarks, the dissertation submitted by Dr. SVILENA ANGELOVA ATANASOVA fully meets the specific requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria and the Regulations for the Development of Academic Staff at Medical University - Varna. Dr. possesses in-depth theoretical knowledge regarding the potential clinical significance of five miRNAs relevant to the pathogenesis of MDS, the levels of which exhibit pronounced correlations with several laboratory parameters, as well as with the risk stratification of patients with MDS. She exhibits the capacity to develop scientific hypotheses and interpret data from both normal laboratory and highly specialized analyses in a creative manner, leading to the production of novel scientific and applied results that represent an original contribution.

Based on the aforementioned, I give my positive assessment of the Thesis and propose to the Honorable Scientific Jury to award the educational and scientific degree "DOCTOR" to SVILENA ANGELOVA ATANASOVA, MD.

Sofia

05.05.2025

Prof. Gueorgui Balatzenko, M.D., Ph.D.