



**УНИВЕРСИТЕТСКА МНОГОПРОФИЛНА
БОЛНИЦА ЗА АКТИВНО
ЛЕЧЕНИЕ**

□ СВЕТА МАРИНА – ПЛЕВЕН □

ГР. ПЛЕВЕН, ЗАПАДНА ИНДУСТРИАЛНА ЗОНА,

УЛ. “БЪЛГАРСКА АВИАЦИЯ”

**Тел.: 064 / 805 666 , 064 / 81 81 , 064 / 806 838 ; Web site: www.svmarina.com ; E-mail:
info@svmarina.com**

R E V I E W

by

Prof. Dr. Nachko Iliev Totsev, MD, head of Department of “Image
Diagnostics and Radiology” at Medical University – Pleven

Appointed reviewer and external member of the Scientific Jury by order No.

RD-26-1165 / 05.05.2021 of the Executive Director of UMBALSM “N. I. Pirogov”

**REFERENCE: participation in competition for acquiring of the
academic position “PROFESSOR”**

in professional area 7. Healthcare and sport, scientific field 7.1. “Medicine”, and
scientific specialty "Medical radiology and X-Radiology" for the needs of the Clinic
of Imaging Diagnostics at the University Hospital "N. I. Pirogov", as announced in
State Gazette iss.no. 19 / 05.03.2021.

Only one candidate has submitted documents for participation in the competition:
Assoc. Prof. Kamelia Zaharieva Genova, Ph.D. The candidate has presented the
necessary documents in accordance with the requirements of the Law on the
Development of Academic Staff in the structure. (ZRASRB, PPZRASRB).

Biography:

Dr. Kamelia Zaharieva Genova, MD was born on July 18, 1966 in Montana.

She graduated from the Medical University of Sofia, majoring in medicine in 1991. She started her career as an resident in the Department of Imaging Diagnostics - 1st Hospital - Sofia from October 1992 to December 1995. From 05.1999 - 11.2002 she worked in the Sofia Oncology Dispensary (SBALOZ). Acquired a certificate for a recognized medical specialty in Imaging Diagnostics on 01.02.1996. From 01.2004 to 03.2004 worked at the Zentralklinikum, Augsburg, Germany. From 04.2004 to 09.2004 worked in the Apparategemeinschaft für Radiologie und Nuklearmedizin, Nuremberg, Germany. From 11.2004 to 07.2011 worked in the MRI Center MDL "Rusev" EOOD, MBAL-NKB EOOD. From 07.2011 to 09.2019 worked in M-TECH EOOD Pirogov. In the period 07.2010 to 11.2019 she worked consecutively as a specialist in Imaging Diagnostics, assistant, head of clinic and associate professor at MBAL-NKB EOOD.

From 02.12.2019 until now she work in the Clinic of Imaging Diagnostics of UMBALSM "N.I. Pirogov " and is the Medical Manager of the MRI department, SMDLOD "N.I. Pirogov".

Since 30.06.2015 she holds educational and scientific degree "Doctor of Medicine" in Medical Radiology and X-Radiology on the topic - "Assessment of morphology and function of the right heart with magnetic resonance imaging in patients after radical correction of the tetralogy of Fallot and right ventricular arrhythmogenic cardiomyopathy" .

Since April 19, 2016, she is an "associate professor" in Medical Radiology and X-Radiology.

Dr. Genova is a member of the following professional associations and scientific organizations:

- Bulgarian Association of Radiology (BAR)
- European Society of Radiology (ESR)
- European Society of Cardiovascular Radiology (ESCR)
- European Magnetic Resonance Imaging Association in Medicine and Biology (ESMRMB)
- Bulgarian Medical Union (BMU)
- Education Commission
- The Union of Translators

Since September 2020, Assoc. Prof. Kamelia Genova has been the President of the Bulgarian Society of Cardio-Thoracic Radiology.

She is fluent in written and spoken English and German language, masters an intermediate level of Russian and basic level of Italian.

She is experienced in clinical trials related to imaging studies - radiography, computed tomography, magnetic resonance imaging, and has participated as a co-

researcher in over 10 international multicenter randomized trials since 2005. She has the necessary technical skills and competencies to work with computers and specific equipment. Her computer skills are excellent.

Assoc. Prof. Genova has certificates and professional qualification in the highly specialized activity "CT and MRI diagnostics".

General characteristics of the candidate's research and applied science activity.

Assoc. Prof. Kamelia Genova, MD, has various specializations in national and international centers and has attended postgraduate courses at home and abroad:

December 7-11, 2015, London

IAEA (International Atomic Energy Agency)

Optimization of the CT examinations

Theoretical knowledge and practical skills for optimization of CT studies

06.2014, London

ESMRMB

Clinical fMRI and DTI- Theory and Practice

Clinical application of functional MPT

04.2012, London

ESMRMB

Diffusion-weighted MR Imaging: From Theory to Practice

Clinical application of extracranial diffusion

07.2013, Athens

GE Healthcare

CT and MRI clinical applications- workshop

Application of CT and MPT in specific clinical situations

02.2012, Budapest

Covidien Healthcare

Advanced neuroradiology

Neuroradiology - advanced course

May 2008, Rome

ESOR

CT and MRI of the heart and great vessels- advanced

Cardio and angio CT and MPT - advanced course

11.2007, Hamburg

ESOR

Advanced CT and MRI-workshop

CT and MPT - advanced course

05.2006, Basel

ESMRMB

Advanced cardiac MRI imaging- theory and practice

Theoretical knowledge and practical skills in the field of cardio MRI

12.2002-12.2003, Sofia

Department of Imaging, MU

Basics of CT and MRI

Certificate for work with CT and MRI

In the procedure for obtaining the academic position "Professor", Assoc. Prof. Dr. Kamelia Genova, Ph.D. participates with 100 scientific papers and publications, including a dissertation and an abstract for educational and scientific degree "PhD" on "Assessment of morphology and function of the right heart with magnetic resonance imaging in patients after radical correction of the tetralogy of Fallot and right ventricle arrhythmogenic cardiomyopathy", as well as a monograph entitled "Cardio magnetic resonance imaging". Three of the publications are in connection with the dissertation paper for the acquisition of "PhD".

PhD body of works taken out, there remain a total number of 55 works divided into the following groups:

Total number of Scientific works	100
Total papers after PhD body	55
Publications in international and Bulgarian journals referenced and indexed in world-famous databases with scientific information	30
Participation in monographs, textbooks and collections	10
Participation in international scientific forums	11
Participation in domestic scientific forums	4

Total IF of 3.782 for published papers.

Based on references and data by NACID and CMB, MU-Sofia in Scopus and ISI Web of Knowledge and according to a document of CMB ref. No. 194 / 26.04.2021 we have a total of 18 Bulgarian citations and 1 citation in foreign databases.

In the afore mentioned scientific papers, Assoc. Prof. Dr. Kamelia Genova is a first or only author in 24 (44%), in 10 papers she is second author (18%) and third or subsequent author in 21 (38%) papers.

Her scientific articles have been published in the journals: Angiology and Vascular Surgery; Bulgarian neurology; Bulgarian cardiology; Bulgarian Society of Cardiothoracic Radiology; Diagnostic and therapeutic ultrasound; Neurosonology and cerebral hemodynamics; Science of cardiology; Practical pediatrics; Pediatrics;

Radiology and Radiology; Emergency medicine; Urology; Polpharma; Physica Medica; Oncology; Cor and Vasa; Journal of Biomedical and Clinical Research; Heart Asia; Open Access Macedonian Journal of Medical Sciences.

Despite its complexity and versatility, the scientific body of work of Assoc. Prof. Dr. Kamelia Genova, MD, shows that her main scientific interests are in the field of CT and MRI diagnosis of cardiovascular diseases, non-invasive assessment of atherosclerotic plaque, neuroradiology - an algorithm for studying some rare symptoms and syndromes, application and specifics of new magnetic resonance techniques, musculoskeletal radiology and urology.

Her publications related to these topics are in several areas:

- 1. Cardio magnetic resonance imaging.**
- 2. Non-invasive assessment of atherosclerotic plaque.**
- 3. Neuroradiology.**
- 4. Imaging diagnosis of vascular diseases.**
- 5. Imaging diagnosis of lung diseases.**
- 6. New magnetic resonance imaging techniques.**
- 7. Muscle - skeletal radiology.**
- 8. Urology.**
- 9. The optimization of the radiation load when conducting X-ray examinations with emphasis on the pediatric population.**

Insights into the scientific works of Assoc. Prof. Dr. Genova give evidence about the high quality of her theoretical and practical professional training and good knowledge of all methods used in imaging - conventional radiology, ultrasound, computed tomography and magnetic resonance imaging.

A significant part of the scientific output of Assoc. Prof. Genova is dedicated to computed tomography diagnostics of cardiovascular diseases and the possibilities of cardiomagnetic resonance imaging in various fields of cardiac practice. Results obtained by her research present very important information about the changes in the coronary arteries, the assessment of the atherosclerotic plaque, the heart cavities and the large main vessels, allowing the construction of prognostic data.

Assoc. Prof. Dr. Genova has extensive practical experience and significant theoretical training in the field of cardiology and angiology, which allows her to do precise analysis of resulting data, as well as presenting her own experience on these issues. As an author, she has a number of publications and reports on cardio MRI in myocardial diseases - inflammatory, non-ischemic and ischemic cardiomyopathies, diseases of accumulation.

She summarizes and analyzes the data from her work during the last fifteen years in the monographic work "Cardio Magnetic Resonance Imaging" (Arbilis Publishing House, 2020, Sofia, p. 246, ISBN: 978-619-7063-43-1). This is the first monograph in this field in our country. The book consistently describes the principles of magnetic resonance imaging and the ability to depict changes in the myocardium in the main groups of diseases and conditions: hypertension, ischemic disease, non-ischemic myocardial involvement, pericardial diseases, tumors, valvular involvement and congenital diseases. Each section presents the changes on which the diagnosis is based, describing the protocols for carrying out the examination and the necessary data that must be contained in the description of the finding. The connection with clinical case necessity is outlined and the contributions and limitations of the method are presented, based on the author's own experience and analysis. Another feature of the work is the clarification of the contributions of individual sequences to a given clinical situation and those of the modern software. Data from the scientific literature is presented.

Computed tomography makes it possible to take responsible clinical decisions when interventions need to be applied. This is especially valuable for varieties and abnormalities in the blood supply.

Computed tomography aortography is the method of choice and the gold standard in acute aortic syndrome. Moreover, aortic dissection, without adequate and timely treatment, can be fatal. Computed tomography aims not only to diagnose dissection, but also to accurately assess the expansion of the process. The classification of the changes based on the affected areas is a prerequisite for choosing an appropriate therapeutic approach.

A large number of publications address issues of vascular changes and variants in the blood supply to the central nervous system. This is the case with a variant in the posterior blood supply to the brain - the Percheron artery.

The papers on this list also indicate the role of modern imaging methods in urology. A comprehensive scientific review analyzes the possibilities of magnetic resonance imaging in prostate cancer, which is a socially significant disease. Data on the development of the equipment used and its technical aspects, the role of the magnetic field strength, the application of the endorectal coil, the sequences used, the contribution of functional magnetic resonance imaging and magnetic resonance spectroscopy, dynamic contrast enhanced scanning, and the possibility of diagnostic scanning are presented and analyzed in relation with local and nodal staging, and for monitoring. The opinions of the European Society of Uroradiology and the American College of Radiology are compared. The contributions of the method, which is constantly evolving, are outlined and its limitations are critically pointed out. A research protocol and risk stratification systems are presented.

Chest and MRI scans of SARS-CoV-2-associated pneumonia and post-Covid syndrome have been reported in detail in studies related to chest imaging.

Rare cases are reported in the field of pediatric radiology: heart disease - Anderson-Fabry disease, Pompe disease, Duchenne disease, Danone's disease. The publication of these cases illustrates the wide range of clinical practice and scientific interests of the author.

Main scientific and applied scientific contributions

- 1. Scientific contributions in the field of cardio magnetic resonance imaging.**
- 2. Scientific contributions in the field of invasive assessment of atherosclerotic plaque.**
- 3. Scientific contributions in the field of neuroradiology.**
- 4. Scientific contributions in the field of vascular imaging diseases**
- 5. Imaging diagnosis of lung diseases**
- 6. Scientific contributions in the field of new magnetic resonance techniques.**
- 7. Scientific contributions in the field of muscle - skeletal radiology.**
- 8. Scientific contributions in the field of urology.**
- 9. Contributions in the field of radiation load optimization in conducting X-ray examinations with emphasis on the pediatric population**

1. Scientific contributions in the field of cardio magnetic resonance imaging

Scientific contributions in this area are related to the assessment of the morphology and function of the right heart in diseases involving the right heart predominantly in diseases involving the right heart predominantly.

(patients with congenital heart disease and cardiomyopathies) and the validation of the method in these groups of diseases. (1,3,4, 5, 6, 24,45, 70, 74, 82, reports 7,9,11,12). Accuracy has been proven and the location of cardio - MRI has been confirmed in patients with diseases predominantly involving the right heart. A comparative analysis was performed and the correlation between the results of cardio MRI and ultrasound and right cardiac catheterization was confirmed.

An algorithm for analysis and processing of cardio MRI tests in indications - assessment of the right heart is proposed. A standardized protocol for cardio MRI examination has been developed.

A clinically adapted protocol for cardio MRI description in these groups of diseases has been developed. Patients with aortic coarctation and other congenital and acquired diseases of the cardiovascular system were evaluated [BP 3, 4, 5, 6, 7, message 5, reports 1, 4, 5, 6, 8, 13, 16, 17].

The possibilities of the method in the different groups of diseases, the specifics and the technique of research, the different types of findings and their interpretation, the indications for the application of cardio MRI are discussed and analyzed. (5-9, 12, 16-18, 21, 22, 41, 43, 57, 61, 64, 67, 68, reports 1, 4-6, 6, 8, 13, 16, 17, 23, 26- 30, 32, 40-43, 46, 49, 50, 54, 56)

The author participates in the development of a diagnostic algorithm and the creation of and management of a national register of patients with cardiomyopathies under the auspices of the Bulgarian Society of Cardiology with conducting and analysis of magnetic resonance imaging in these patients and in particular in patients with amyloidosis. (58, reports 45, 52).

2. Scientific contributions in the field of invasive assessment of atherosclerotic plaque.

Scientific contributions in this area are related to determining the diagnostic value of non-invasive imaging methods (multidetector computed tomography and magnetic resonance imaging) in the study of morphology of atherosclerotic plaque against a reference standard pathohistological examination of carotid endarterectomy material; creation of protocols for examination and interpretation of CT and MRI examinations, as an important part of the algorithm for diagnosis and treatment of extracranial carotid stenoses. (14, 25,28, 30, 81, reports 14,15,19).

Protocols for MDCT and MRI studies in determining the morphology of atherosclerotic plaque have been developed and optimized.

An algorithm for analysis of MDCT and MRI based on correlation with pathohistology of the study results was developed.

An analysis of the morphology and distribution of atherosclerotic coronary plaques detected by CT coronary angiography was performed.

The role of the application of vasodilators for the improvement of imaging of peripheral branches of the coronary arteries.

The principles are analyzed and the place and possibilities for application of new methods for diagnosis of vulnerable coronary plaque.

3. Scientific contributions in the field of neuroradiology.

The main contributions in this direction are applied, educational, related to the study and description of rare syndromes and diseases and the application of new imaging techniques [BP 9, 17, 24, 25,26, reports 1, 3,4,12, 13].

They are described in a synthesized manner as techniques, diagnostic value and application and the various imaging methods are illustrated (conventional radiology, angiography, computed tomography, magnetic resonance imaging, radioisotope methods) used for diagnosis in neurology. There is a description of the algorithm for selection of the most suitable diagnostic method for deciding individual diseases, adapted for medical students. (15, 20).

Description, review and discussion of our experience in the diagnosis of a few rare clinical cases - Charles Bonnet syndrome; basilar artery fenestration; spinal epidural lipomatosis; dysgenesis of the corpus callosum; two spontaneous spinal epidural hematomas; Percheron's heart attack; diagnosis of brain death and current problems of donation (29, 36, 38,41,47, 54, 77, 78, 85, 87)

Description and discussion of the possibilities of new magnetic resonance techniques for diagnosis and characterization of brain tumors and tumor-like lesions - diffusion (DWI) and diffusion tensor imaging (DTI), contrast and non-contrast perfusion (DCE, DSC, ALS) and spectroscopy (MRS) (56)

An analysis of the modern imaging diagnostics of the processes in the third ventricle is presented. (23).

4. Scientific contributions in the field of vascular diseases' imaging

Contribution in this area is the description and analysis of methods for imaging of diseases of the aorta and peripheral vessels, commenting on imaging methods, protocols and the main findings in various types of pathology. (12, 21, 19, 32, 42, 98, reports 2, 3) The study of rare vascular diseases such as Takayasu's arteritis is also a contribution, as well as the work in the field of planning and monitoring the effect of interventional treatment of vascular diseases. (39,44,90, reports 15, 21, 34, 35,38).

5. Imaging diagnostics of lung diseases

Contributions in this area are studies in the field of diffuse parenchyma diseases, pulmonary hypertension and pulmonary thromboembolism and rare lung diseases. (2, 34, 37, 47, 56, 79, 83, reports 18, 33). Of particular importance is the contribution to the diagnosis, follow-up of changes in the lungs in Covid - 19, incl. participation in the development of a protocol for assessment and standardized description of the computed tomography examination in these patients. (54, 59, reports 48, 51) The first in Bulgaria description of a magnetic resonance finding in the lungs in a patient with Covid-19, as well as a proposal for a protocol for the study. (58)

6. Scientific contributions in the field of new magnetic resonance techniques.

The main contributions in this area are in the study of magnetic resonance diffusion (DWI) and its extracranial applications. This is a new type of MR technique that provides functional information. For the first time in our country a complete overview of the extracranial applications of DWI has been made, analyzing the technical aspects of the application of the technique, its application in different diseases, the diagnostic value of different findings, ways of interpretation and calculation of DW coefficient. The analysis was made on the basis of the author's own experience and in accordance with the standards adopted at this stage (33, 34,35).

Other new techniques applied for the first time in our country since the beginning of 2020 are the T1 and T2 mapping techniques, allowing quantitative assessment of tissue changes and finding main application in myocardial diseases. The author

presents the results of her work with these techniques, both in the monograph (5) and in publications (62, 64, 65, 66) and reports (49, 50, 52-56).

7. Scientific contributions in the field of musculoskeletal radiology.

The main contributions in this direction are applied, related to the translation of the 2nd English edition of Illustrated Notes on Muscle - Skeletal Magnetic Resonance Imaging. The manual discusses the main applications of MRI in the diagnosis of diseases of the musculoskeletal system. Until now, we lacked literature in this area and the translation of one of the most popular manuals in Europe is useful for both diagnostic specialists and traumatologists and helps to unify the interpretation of findings and terminology in this area (13).

8. Scientific contributions in the field of urology.

The main contributions in this direction are related to the study and comparative analysis of the diagnostic value of MP urography and other magnetic resonance techniques with ultrasound diagnosis of kidney disease (81), multiparametric magnetic resonance imaging for screening patients with suspected prostate cancer (35, 94, 95, report 39), as well as to determine the degree of muscle invasion MRI in bladder tumors. (67) The introduction of standardized examination and description protocols in line with international standards is also a contribution to multiparametric MRI for the assessment of prostate cancer. (94, 95, report 39)

9. Contributions in the field of beam load optimization at conducting X-ray examinations with an emphasis on pediatric population. (48, 51, 60, 86, 88, 89, 96, 99, reports 36, 37)

In collaboration with a medical physicist, a protocol was developed for conducting cardiovascular CT examinations in children with reduction of the radiation dose while maintaining high image quality, for which the center (NCC, Department of Imaging) is certified by the IAEA in 2019. The images from the studies conducted with this protocol were used to obtain of the first 3D models of the heart and vessels in Bulgaria in children with congenital heart malformations for the needs of pediatric cardiac surgery.

The author participated in a study aimed at optimizing the dose for the patient at endovascular and hybrid procedures for lower extremity revascularization, as well as in a number of IAEA projects related to radiation load reduction in diagnostic imaging (RER6032 Strengthening Quality Assurance and Quality Control in Diagnostic X-rays IAEA; RER9132 Strengthening Member State Technical Capabilities in Medical Radiation Protection IAEA. Oracle Project Number: 3060460 (RER9132); Project RER9 / 147 "Enhancing Member States' Capabilities for Ensuring Radiation Protection of Individuals Undergoing Medical Exposure."; IAEA Study on use of CT in patient with COVID-19 pneumonia.

Teaching, research and organizational activity.

The report on the teaching and lecturing workload of Assoc. Prof. Dr. Kamelia Genova, MD - for the period 2016/2021 shows that on annual basis her academic load is on average: practical classes with students from MU-Sofia MC "J. Filaretova" - 100 academic hours; lectures - 75 academic hours; she is teaching at MU - Sofia for students specializing in "Imaging Diagnostics" a basic course of 15 academic hours, which corresponds to the requirements for holding the academic position of "Professor".

Assoc. Prof. Genova actively participates in conducting semester and state exams - a total of 342.75 academic hours, training of graduates - 1484.4 academic hours and individual training of three specializing graduates - 154 academic hours.

For the period 01.01.2016 - 30.11.2019 Assoc. Prof. Genova has been a scientific adviser for 10 graduates enrolled in the specialty "Radiology".

After "PhD procedure" she has participated in the presentation of 33 lectures and plenary reports at international and Bulgarian forums.

CONCLUSION:

Assoc. Prof. Dr. Kamelia Zaharieva Genova, MD is an established specialist and lecturer in diagnostic imaging. The presented documents certify that the scientific and teaching activities meet the requirements of the Law for Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the conditions and procedure for acquiring scientific degrees and holding academic positions at the Medical University - Sofia. Based on the above and based on my personal impressions, I offer in full conviction to the esteemed Scientific Jury to vote affirmatively for Assoc. Prof. Dr. Kamelia Zaharieva Genova, Ph.D. to take the academic position "Professor" in the scientific specialty "Medical Radiology and X-Radiology (including the use of radioactive isotopes)" for the needs of the Clinic of Imaging Diagnostics of UMBALSM "N. I. PIROGOV» EAD - Sofia.

June 10th, 2021

Prepared by:

Pleven

Prof. Dr. Nachko Iliev Totsev, MD