



To
Chairperson of scientific panel
appointed pursuant to Ordinance No. P - 2303/
03.07.2024
of the Vice Rector of Medical University - Plovdiv
15A Vasil Aprilov Blvd, 4002, Plovdiv

Please, find attached: Review

under competition for acquiring academic position: "PROFESSOR"

in scientific specialty "Rheumatology"

announced for the needs of MU - Plovdiv, Department of Propaedeutics of Internal Diseases "Prof. Anton Mitov, MD, PhD" in SG, issue 35/ 19th April 2024

Reviewer: Assoc. Professor Tsvetanka Petrova Petranova, MD, PhD

Scientific specialty: Rheumatology

Institution: Faculty of Medicine, Medical University - Sofia

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

The review has been prepared in accordance with the requirements laid down in the Academic Staff Development Act of the Republic of Bulgaria, its Implementing Rules and the Rules for Academic Development at Medical University - Plovdiv for the acquisition of the academic position "Professor".

REVIEW

I. Biographic information, review of candidate's career profile, professional experience.

Assoc. Professor Rositsa Valerieva Karalilova, MD, PhD, DMSc is an alumna of Medical University - Plovdiv. In 2005, she completed her higher education majoring in Medicine with excellent results from state examinations. The same year, she commenced her practice as a physician at UMHAT Kaspela in the city of Plovdiv, Rheumatology Clinic, where she has been working ever since. After winning a competition in 2013, she took the academic position “Assistant” at the Department of Propaedeutics of Internal Diseases “Prof. Anton Mitov, MD” at the Faculty of Medicine, Medical University - Plovdiv, and her academic development has consistently progressed through the academic position “Chief Assistant” (2018) and the academic position “Associate Professor” (2022). In 2014 she acquired recognized specialty in Rheumatology. Since 2018, she has been the Chief Administrative Assistant and **Academic Activities Supervisor** at the same department. In 2023 she provisionally performed the duties of **Head of Department** of Physical and Rehabilitation Medicine. Since December 2023, she has been a member of the Faculty Council at Faculty of Medicine at MU - Plovdiv and in January 2024 she was elected **Deputy Dean** for Academic Activities at the Faculty of Medicine at Medical University - Plovdiv.

The submitted Certificate of service as at April 2024 shows that the candidate has 18 years and 6 months of service as a physician.

The intensive scientific work of Assoc. Prof. Karalilova resulted in the writing and successful defense of two dissertations and in 2018 she acquired **educational and scientific degree “Doctor”** based on her dissertation titled “Diagnostic capabilities of new ultrasonographic techniques for the assessment of skin, articular, periarticular and pulmonary involvement in systemic sclerosis”, and in 2021 she acquired **scientific degree “Doctor of Science”** following the successful defense of her dissertation on “Imaging and serum biomarkers for pulmonary and joint involvement in patients with systemic sclerosis“. The topic of the dissertations highlights the scientific interests and need for research in this field of rheumatology.

Assoc. Professor Karalilova has received training at national and international courses – musculoskeletal ultrasound (2008 Sofia; 2012 Gratz, 2015 Rome, 2016 Leeds, 2017 Madrid and she holds a qualification from The European Alliance of Associations for Rheumatology (EULAR) for Ultrasound Trainers in Rheumatology, and in 2017 she became a certified European trainer in Musculoskeletal Ultrasound; she possesses qualification in capillaroscopy (2016, Genoa, EULAR course); EULAR post-graduate training in rheumatology (2013, Prague).

Assoc. Professor Karalilova is a member of renowned international and national professional organizations. She is a member of the Bulgarian Society of Rheumatology, the Managing Board of Bulgarian Association of Musculo-Skeletal Ultrasound (BAMSU) and since 2023 she has been its **Chairperson**; she is a member of the Faculty Council at the Faculty of Medicine at Medical University – Plovdiv. In addition, she is the **leader** of an international working group of COST action for osteoarthritis under the European Cooperation in Science and Technology program; she is a member of the groups OMERACT (Outcome Measures in Rheumatology), EUSTAR – an international scleroderma research network acting under the auspices of EULAR. She has participated in numerous intrauniversity and international projects and initiatives. Assoc. Professor Karalilova has submitted information about participation in **8 international** projects as well as in **3 intrauniversity** projects - NO - 01/2022 "Mitochondrial function and cellular metabolism as parameters for assessing the treatment effect in rheumatoid arthritis"; NO - 12/2022 P-9631 „Levels of adipokines (chemerin and resistin) in serum and synovial fluid of patients with rheumatoid arthritis and osteoarthritis of the knee joint“ and PMD 06/2022 „Impact of COVID-19 infection in patients with rheumatic diseases and the need for remote access to medical care during pandemic”.

II. General description of materials submitted for the competition.

The candidate Assoc. Prof. Karalilova, has submitted on time a full set of documents as a hard copy/on electronic medium which is in compliance with Article 120 of Section V of the Rules for Academic Development at Medical University - Plovdiv. Documentary evidence include an European format Curriculum Vitae; a copy of diploma of completed higher education with supplement; a copy of diploma of acquired educational and scientific degree “Doctor” in scientific specialty Rheumatology and a copy of diploma of acquired scientific degree “Doctor of Science”; Certificate of service in the relevant specialty and information summary of all academic positions held so far; Academic transcript of the teaching workload of the candidate over the last three academic years; a copy of the most recent evaluation sheet; Author’s summary of the dissertation for acquiring educational and scientific degree “Doctor”; Author’s summary of the dissertation for acquiring scientific degree “Doctor of Science”; habilitation paper – monograph; a list of publications in scientific editions, referenced and indexed only in Scopus and/or Web of Science; a list of publications in unrefereed peer-reviewed journals; a list of citations and/or reviews in scientific editions, referenced and indexed only in Scopus and/or Web of Science with evidence from databases; a list of citations in peer-reviewed monographs and collective volumes; a list of citations and/or reviews in unrefereed peer-reviewed journals; a copy of diploma of recognized specialty; Document/s certifying participation in an international/educational project; Document/s certifying leadership of an international scientific/educational project; Participation in publication of a university textbook in Bulgarian and in

English; Documents certifying training of interns, resident physicians and doctoral students issued by a relevant section/department of the higher educational institution/scientific organization; Information summary about the original scientific contributions with evidence; Self-evaluation form on compliance with the specific academic scoring requirements in the main units of MU - Plovdiv; Declaration on originality and authenticity of the submitted documents; Copies and abstracts of the submitted publications in Bulgarian and in English; Other documents – qualification courses, certificates, membership and other related to educational activity, scientific research activity, related to administrative activity; participations and membership in scientific forums, committees. Considering the purpose of the competition for teaching in Bulgarian and in English, this part of the requirements has also been met.

All documents conform to the requirements of ASDARB and its Implementing Rules at MU - Plovdiv.

III. Evaluation of candidate's academic papers for the overall academic development.

Assoc. Professor R. Karalilova, MD, PhD, DMSc, participates in the competition with author's summary of dissertation for acquiring educational and scientific degree "Doctor", author's summary of dissertation for acquiring scientific degree "Doctor of Science", habilitation paper – self-authored monograph, **24 full-text publications** in scientific editions, referenced and indexed in *Scopus/Web of Science*, of which **20 with Impact Factor** as per Journal Citation Report (Web of Science), with 7 full-text publications in unreferenced peer-reviewed journals, **184 citations** in scientific editions, referenced and indexed in *Scopus/Web of Science*, 1 citation in a peer-reviewed monograph, 7 citations in unreferenced peer-reviewed journals. The submitted publications and citations have not been used in past procedures for educational and scientific degree "Doctor", scientific degree "Doctor of Science" and academic position "Associate Professor".

The scientific activity of Assoc. Prof. Karalilova includes works on relevant problems on different topics in both rheumatology and other fields of medicine, interdisciplinary works which clearly demonstrates candidate's diverse interests – systemic connective tissue diseases, inflammatory joint diseases, degenerative and metabolic disorders, systemic vasculitides, research in biomarkers, including musculo-skeletal ultrasound. The scientific papers submitted for review reflect a systematic and ascending path of development as well as profound scientific interests. The scientific problems researched independently and in collaboration with various teams highlight the following lines of research:

- **Ultrasound study** and possibilities to improve diagnostics and early discovery of organ involvement in systemic sclerosis; Establishment of standards of normal *skin thickness and echogenicity* of the Bulgarian population; Description of US differences when determining skin thickness

and echogenicity in patients with various forms of SSc; Proposed mathematical model (score) – modified Rodnan skin score (*mRUS*) for objective assessment of quantitative changes occurring in the skin of SSc patients; US assessment of articular and periarticular involvement in SSc patients and development of an **algorithm** for using US to assess the earliest skin, joint and pulmonary changes in order to improve early diagnostics of patients with this condition; Substantiation of relation between increased skin thickness in early diffuse cutaneous SSc with the degree of pulmonary involvement assessed by using *lung ultrasound*; Development of a new ultrasound score (*US10SSc score*) for the assessment of joint and tendon manifestations in SSc patients; Assessment of *enthesal involvement* and *synovio-enthesal complex* in SSc patients; Research in the role of high-frequency US in patients with **Polymyalgia rheumatica** (PMR) by analyzing articular and periarticular changes in such patients; US assessment of **vascular involvement in PMR patients** not presenting with clinical indications of vasculitis; Establishment of reference values for intima–media thickness in PMR patients in the Bulgarian population; Research in the prevalence of **subclinical vasculitis** in such patients by analyzing the type and number of affected arteries; Study on the efficiency of *JAK inhibitors on the skin, joint and pulmonary involvement in SSc patients* with US assessment; Study on the role of musculoskeletal **US as a remission predictor** in patients with rheumatoid arthritis; Research into the prevalence of joint and tendon abnormalities in asymptomatic (healthy) individuals using US; Investigation of the capabilities of US in the diagnostic process as well as in the differentiation between rheumatoid and psoriatic arthritis; **Validation of 3D printed US training models for Giant cell arteritis**; Assessment of amyloidosis-associated joint involvement using US; Investigation of enthesal involvement in patients with rheumatoid arthritis, spondyloarthritis using US as well as diagnostic value of US in carpal tunnel syndrome; Analysis of the role of US in assessing changes in the salivary glands in patients with Sjögren's syndrome; Analysis and presentation of the Bulgarian experience with the application of the new algorithms of Targeted Ultrasound Initiative (TUI) for using musculoskeletal US in patients with rheumatoid arthritis; Analysis of the imaging resolution limit of experts in vascular ultrasound.

• **Biomarkers** – Investigation of a series of biomarkers IL-6, YKL-40, TGF- β 1, ICAM-1, CXCL-4, IL 12p40, TNF- α , IL-17A in SSc patients and study into their role in the various organ involvement as well as correlations with imaging biomarkers (US) for lung and joint involvement; Assessment of the predictive role of some serum biomarkers in the joint and lung involvement in SSc patients; Study into the levels of genetic expression of genes associated with the inflammatory response (for YKL-40, TNF α , IL-6, IL-12p40, IL-17A) in SSc patients; Investigation of the expression levels of miRNAs (miR-24, miR-30c, miR-125a, miR-153, miR-214) in order to assess their involvement in the regulation of YKL-40 expression in patients with SSc; Investigation of correlations between serum level of some biomarkers and adverse progression of SSc; Examination of the axis

MALAT1/miR-30e/YKL-40 in SSc; Analysis of the correlation between YKL-40, MMP-9 and US finding in osteoarthritis in knee joints; Assessment of the role of IL-17 in the pathogenesis of rheumatoid arthritis; Evaluation of the diagnostic and prognostic role of the IL-6 serum levels and carotid US for establishing subclinical atherosclerosis in patients with rheumatoid arthritis and ANCA-associated vasculitis; Investigation of the levels of adipokines (chemerin and resistin) in serum and synovial fluid in patients with rheumatoid arthritis and osteoarthritis of the knee joint; Assessment of the role of US as a biomarker in rheumatic diseases; Investigation of IL-6 levels in patients with inflammatory joint diseases upon treatment with blockers of tumor necrosis factor- α and presence of neutralizing antibodies and follow-up of such patients.

• **Lung ultrasound** - Analysis of lung changes in SSc patients using this study method and assessment of its reliability by conducting comparative analysis with high-resolution computed tomography (HRCT). Based on the obtained results, LUS has been proposed as a screening method to assess pulmonary and joint involvement in SSc patients in order to evaluate interstitial pulmonary involvement.

• **Elastography** - Elastography assessment of (strain elasto) the skin in healthy individuals, for the first time in Bulgaria (and among the first in Europe) reference values have been derived by creating a five-grade scale for the grading of skin density and elasticity; Improvement in the elastography technique and proposition of a number of improvements as well as an algorithm; Application of elastography as an assessment method for the elasticity of the spleen in SSc patients and its changes in the course of the disease; Elastography assessment of salivary glands in SSc patients; Application of elastography technique to assess skin elasticity in eosinophilic fasciitis.

• **Rheumatoid arthritis and psoriatic arthritis** - Investigation of the mitochondrial function and activity in patients with rheumatoid polyarthritis through the cellular respiration processes; Assessment of compliance and persistence to the treatment using biological means in patients with rheumatoid arthritis in the Bulgarian population; Study of the effects of physical factors on the activity of rheumatoid arthritis; Examination of the connection among psoriasis vulgaris, psoriatic arthritis and risk of secondary gout; Analysis of laboratory and functional change in the status of patients with psoriatic arthritis put on THF- α inhibitors therapy; Study of the pathobiochemical mechanisms related to iron homeostasis and parameters of inflammatory activity in patients with rheumatoid arthritis as well as in those with diabetes mellitus; Investigation of the connection among sRANKL, OPG and sRAGE as markers of bone metabolism in rheumatoid arthritis and iron homeostasis and inflammatory processes; Examination and analysis of the connection among oral microbiome – periodontitis – rheumatoid arthritis; Investigation of the practical approach toward patients with rheumatoid arthritis who have achieved remission/low disease activity of their condition;

Analysis of the significance of Body Mass Index (BMI), activity of disease, clinical and sonography data of remission in patients with rheumatoid arthritis.

- **Osteoarthritis and osteoporosis** - The first ultrasound phenotyping in patients with osteoarthritis in Bulgaria; Investigation of the prognostic risk factors for knee joint osteoarthritis as well as for pseudogout; Assessment of risk factors for hand osteoarthritis in patients with type 2 diabetes; Examination of the various medication regimens in patients with knee joint osteoarthritis and assessment of the suitability of platelet-rich plasma for this localization of the disease; Analysis of patients with osteoporosis induced by aromatase inhibitors used to treat breast cancer; Analysis of treatment possibilities in osteoarthritis and effects of primary therapy on rheumatic diseases and their hepatotoxicity; Examination of effectiveness of antimalarial drugs as a treatment option in patients with hand osteoarthritis.

- **Other lines of research** - Investigation of the spread and clinical significance of COVID-19 infection in Bulgarian patients with rheumatic diseases and analysis of their unmet needs; Study of the pleiotropic effects of statins in inflammatory joint diseases and characterization of diabetic arthropathy; Development of prediction models for the assessment of comorbidities in patients with DISH syndrome; Examination of the role of carotid ultrasound as a non-invasive method in rheumatology practice; Investigation of sexual fears and sexual contact avoidance behavior in medical students; Characterization of crystalline arthropathies with respect to the clinical course and diagnostic approaches; Analysis of insomnia in Low Back Pain patients; Investigation of drug-induced neutralizing antibodies in patients with rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis treated with TNF- α blockers; Investigation of the long-term effectiveness of Tocilizumab IL-6 inhibitor in Takayasu arteritis.

Research in musculoskeletal ultrasound, biomarkers and in systemic sclerosis make up the largest share resulting in the defense of the two dissertations. Alongside of them, there is also a clear interest in other areas of the medical science which has produced joint works with interdisciplinary teams, including such of international composition. The significance and relevance of the problems researched by Assoc. Prof. Karalilova is reflected in a series of publications in renowned editions such as *Annals of Rheumatic diseases* – the leading rheumatology journal (Impact Factor (JCR) - 20.3; Impact Factor rank (JCR) - 2/57; Citescore – 35), with the candidate submitting 3 such publications specifically for the purposes of this competition.

Assoc. Professor Karalilova has submitted participation in **8 international scientific projects** with subsequent publications in high-rating international editions as well as in national ones. **She is the leader of 1 international project.**

As at the moment of competition announcement, the candidate has submitted an official information summary showing that **2** doctoral students have successfully defended their dissertations

under her supervision. In addition, currently she is the supervisor of **5** doctoral candidates at various stages of their dissertation writing, one of whom has been signed off with a right to dissertation defense.

The valuable and prestigious scientific activity in which Assoc. Prof. Karalilova has been involved explains her contribution as a reviewer for international journals which is supported by the submitted reviews of 8 scientific papers.

IV. Evaluation of the monograph submitted by the candidate for participation in the competition for acquiring the position of “PROFESSOR”.

On item C) of the mandatory academic scoring indicators of MU - Plovdiv for the announced competition, Assoc. Prof. Karalilova participates with a monograph titled “Ultrasound phenotypes in osteoarthritis“ with ISBN 978-619-237-134-0 published in 2024. The monograph focuses on one of the modern diseases which remains unsolved from a treatment standpoint. One of the reasons for this is the fact that osteoarthritis is a condition which affects the “entire joint” as well as being a disease which affects the “entire organism” considering the high prevalence of comorbidities in such patients. Treatment ineffectiveness in osteoarthritis to a great extent stems from the diverse clinical presentations which requires precise phenotyping and stratification of patients. Ultrasound study is an indispensable part of the arsenal of the modern rheumatologist and provides valuable information throughout the diagnostic process. The submitted candidate’s own ultrasound clinical research is yet another evidence of an innovative approach in the field of osteoarthritis. I am confident that this monograph will be a useful practical read for rheumatologists, orthopedists, physical therapists, sports medicine physicians.

V. Presence (citation) of candidate's publications in national and international literature (publication image).

Assoc. Professor Karalilova has submitted **184** citations in scientific editions, referenced and indexed in renowned world scientific information data bases, **1** citation in foreign peer-reviewed monograph, and **7** citations in unreferenced peer-reviewed journals. The submitted citations have not been used in past procedures.

The candidate has Hirsch index - 9 registered in Scopus and the official information summary.

VI. Comprehensive, quality evaluation of educational and methodology and teaching activity, including as an academic supervisor to students, PhD candidates, residents.

The submitted Academic transcript for the teaching workload at diagnostic/treatment units over the last three academic years shows that Assoc. Prof. Karalilova has had **5458.1 hours**, of which

the teaching workload amounts to 2821.1 hours. The educational and teaching activity with students comprises seminars and lectures in Bulgarian and in English in Propaedeutics of Internal Diseases, Rheumatology, Internal Diseases to medical, dental medicine students as well as students studying in the specialties Medical Nurse, Midwife and Physician assistant. The candidate is actively involved in the training of intern and resident physicians in various specialties of internal and general medicine, in the training of students and teachers from the international exchange, Erasmus + program.

Assoc. Professor Karalilova is a member of midterm examination committees for medical students in Bulgarian and in English, the midterm exam committee for Propaedeutics of Internal Diseases of students in the Faculty of Public Health, participates in competition examinations of doctoral students at MU-Plovdiv, in examination committee of doctoral students of rheumatology, for enrollment in Rheumatology specialty, in committees for colloquia on Rheumatology, Internal Diseases, participates in state examination committees on Rheumatology specialty, in a scientific panel for educational and scientific degree “Doctor”, for scientific degree “Doctor of Science” in Rheumatology, in a committee for the appointment at academic position “Assistant”, “Chief Assistant” in Rheumatology, in a scientific panel on competition for acquiring academic position “Associate Professor” and academic position “Professor”. She is appointed Chairperson of committee on Academic Activities at the Faculty of Medicine, MU – Plovdiv.

The candidate participates in the teaching of qualification courses in musculoskeletal ultrasound to experts and resident physicians in rheumatology, orthopedics, physical therapy, dermatology and capillaroscopy courses to rheumatologists, dermatologists. She is appointed as supervisor for the practical residency of 3 resident physicians specializing in rheumatology by virtue of an order of the manager of UMHAT Kaspela.

The academic leadership and the entire joint work with students, resident physicians and doctoral candidates including intrauniversity projects with them, have produced 69 scientific publications in both referenced and unreferenced scientific editions as well as participations in international and national scientific congresses and conferences which is an indisputable token of continuity.

The evaluation scores from the most recent evaluation sheet of the candidate present a **very good evaluation score of 90.7 points.**

VII. Critical remarks and recommendations.

I have no critical remarks and recommendations

VIII. Overall assessment of candidate’s compliance with the minimum national requirements under Art. 2(b), paras 2 and 3 and respectively with the requirements under Art. 2(b), para-

graph 5 of ASDARB and the specific requirements of MU - Plovdi are presented in the table below.

MANDATORY MINIMUM ACADEMIC SCORING INDICATORS OF MU-PLOVDIV FOR FIELD 7.1. MEDICINE (medical and clinic)

GROUP	INDICATORS	AP "PROFESSOR" (points)	Assoc. Professor R. Karalilova, DMSc (points)
A	1. Dissertation for the acquisition of educational and qualification degree "PhD"	50	50
B	2. Dissertation for the acquisition of scientific degree "Doctor of science"		100
C (3, 4)	3. Habilitation paper - monograph	100	100
	4. Habilitation paper - scientific publications (not less than 10) in editions referenced and indexed in world renowned scientific information data bases		
D (5-9)	5. Published monograph which is not presented as a primary habilitation paper	250 15 articles of which 10 in journals referenced in Scopus and/or Web of Science, including 5 articles with IF	
	6. Published book based on defended dissertation for the acquisition of educational and qualification degree "PhD" or scientific degree "Doctor of Science"		
	7. Publications and reports published in scientific editions referenced and indexed in world renowned scientific information data bases		234.99 p. 24 articles references in Scopus and/or Web of Science, including 20 with IF
	8. Articles and reports published in unreferenced peer-reviewed journals or published in reviewed collective volumes		60.5 p. 7 articles in unreferenced peer-reviewed journals
E (10-12)	9. Published chapter of collective monograph		
	10. Citation and reviews in scientific editions referenced and indexed in world renowned scientific information data bases or in monographs and collective volumes	300 15 citations referenced in Scopus and/or Web of Science	2760 p. 184 citations referenced in Scopus and/or Web of Science, 120 p. - 8 rev.
	11. Citations in peer-reviewed monographs and collective volumes		10 p. 1 citation in a peer-reviewed monograph
12. Citations and reviews in unreferenced peer-reviewed magazines	35 p. 7 citations in unreferenced peer-reviewed journals		

F (13-22)	13. Acquired scientific degree "Doctor of Science"	140 - 2 successful PhD candidates - 1 scientific project -1 textbook/study guide	40 p.
	14. Supervisor to a successful PhD candidate		80 p.
	15. Acquired medical specialty		40 p.
	16. Participation in a national scientific or educational project		
	17. Participation in an international scientific or educational project		160 p.
	18. Leadership of a national scientific or educational project		
	19. Leadership of an international scientific or educational project		40 p.
	20. Published university textbook or textbook used in the school network		2.46 p. (1.25 + 1.21)
	21. Published university study guide or study guide used in the school network		
	22. Training of interns, residents and PhD candidates (seminars and practical training sessions)		555.5 p.
G	Teaching activity:		
	Teaching workload (lectures and seminars):	200 points (over the last 2 y X 1 point/hour)	1035 p.
	Academic position:	200 points (Associate Professor – 100 points per 1 year)	200 p.
TOTAL		1240	5623.45

IX. Conclusion

Based on all of the above, Assoc. Prof. Karalilova, MD, PhD, DMSc not only fulfills but exceeds multifold the minimum national requirements for acquiring the academic position "Professor". She fully covers the academic scoring indicators of MU - Plovdiv and those laid down in ASDARB, its Implementing Rules, and I therefore recommend to the esteemed members of the SP to vote in favor of Assoc. Rositsa Valerieva Karalilova MD, PhD, DMSc to acquire the academic position "Professor".

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

24.07.2024

city of Sofia

Reviewer:

Assoc. Prof. Tsvetanka Petrova Petranova, MD, PhD