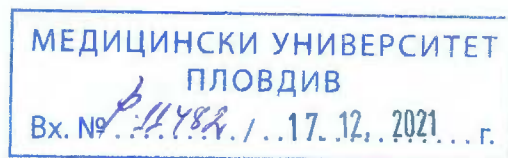


To the Chairman of the Academic Jury,
Appointed by Order № P - 1882 / 22.10.2021
of the Rector of the Medical University, city of Plovdiv
15 A Vasil Aprilov Blvd.
4002 city of Plovdiv
On your Protocol № 1/ 03.11.2021



Attached I present: Review

in a competition for holding the academic position of "ASSOCIATE PROFESSOR".
in the field of higher education 7. **Healthcare and sport**
Academic field 7.1 **Medicine**
Academic specialty **Psychiatry**
Announced for the needs of Medical University – city of Plovdiv, Department of Psychiatry and
Medical Psychology for teaching Psychiatry in both Bulgarian and English language
State gazette, No. 63/30.07.2021

Reviewer: Prof. Ivanka Boncheva Paunova, PhD

Academic major/s/: Clinical and Medical Psychology
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Candidate:

Chief Assistant Professor Sevdalina Sevdalinova Karaivanova – Kandilarova, MD, PhD

I. Short biography and career profile of the candidate

Dr. Kandilarova graduated in Medicine at the Medical University of Plovdiv in 2005. A year later she moved to work in Norway from 2006 to 2010. Since August 2006 to May 2007 she was an research assistant under Prof. Kenneth Hugdal supervision at the functional magnetic resonance imaging (fMRI) section at the Department of Cognitive Neuroscience, Division of

Biological and Medical Psychology at University of Bergen, Norway. From October 2007 to September 2008 she worked as a resident doctor at the Department of Gerontopsychiatry at the Psychosomatic Clinic of the University Hospital Haukeland, Bergen. For the period 2008-2010 she specialized in Psychiatry at the Psychiatric Clinic Tertnes at the same university.

After returning to Bulgaria in 2012, she was registered as a full-time doctoral student at the Department of Psychiatry and Medical Psychology, Medical University of Plovdiv. Her dissertation work on "Neurophysiological markers for diagnosis and prognosis in depression" was defended in 2017. Thus she acquired the academic degree "Doctor Philosophiae". Since 2013 she is a specializing doctor in Psychiatry at Medical University of Plovdiv, Department of Psychiatry and Medical Psychology and the Clinic of Psychiatry, University Hospital Sveti Georgi, Plovdiv. In 2017 she acquired a specialty of Psychiatry. Since February 2014 she was Assistant Professor at the Department of Psychiatry and Medical Psychology at Medical University of Plovdiv and since March 2018 she became Chief Assistant Professor. In the period October 2015-January 2021 she was a member of the team at the Psychiatric division at the Research Complex of Translational Neuroscience at Medical University of Plovdiv with main tasks- design and programming of paradigms, extraction and analysis of fMRI data. In February 2021 she was appointed as a doctor, specialist in psychiatry at the Clinic of Psychiatry and Medical Psychology of the University Hospital Sveti Georgi, Plovdiv where she currently works.

In the period 2013-2018 she participated in training courses in Basel, Switzerland and Bergen, Norway. The last two courses in Norway are the result of an individual grant won under the Higher Education Mobility Program of the European Economic Area (EEA) and Norway Grants. All of them are related to the use of neuroimaging methods to study the structure and function of the human brain. In 2018 she attended in Plovdiv a specialized course "Neuroimaging methods in neuroscience for the study of human brain in normal condition and in pathology" with a focus - structural neuroimaging and voxel-based morphometry.

Dr. Kandilarova is fluent in English and she also has a good knowledge of French and Norwegian.

Overall assessment: Dr. Sevdalina Kandilarova, MD, PhD began her career development at the University of Bergen, Norway. There she had the opportunity to work under the supervision of internationally recognized experts in psychiatry and cognitive neuroscience as well as to specialize in psychiatry. Due to the collaboration with European centers with high experience in the field of neuroscience, mainly from Norway and Switzerland, Dr. Kandilarova acquired

in-depth theoretical knowledge and practical skills which she applies constantly in our country. This makes her a narrow, high qualified specialist and researcher. Currently, Dr. Kandilarova is a lecturer, researcher and recognized doctor, diagnostician and therapist with an outstanding role in the Clinic of Psychiatry at the University Hospital Sveti Georgi, Plovdiv and in the Department of Psychiatry and Medical Psychology of Medical University, Plovdiv.

I. General description of the presented documents

All required administrative documents, evidence of professional and career development - diplomas, certificates and references are presented; copies of academic publications, references for scientific contributions, citations and minimum scientometric requirements as well as documents certifying her teaching activity. All submitted materials comply with the requirements under the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB) and the Regulations for its application at Medical University of Plovdiv.

I. Evaluation of the candidate 's academic works for the overall academic development

✓ General characteristics of the academic work and publications

The applicant participates in the competition with 29 academic works, 20 of which are full-text publications in foreign journals with impact factor (mainly between 3 and 5, maximum IF 9.306); 2 in foreign refereed journals without impact factor; 2 in national journals and academic textbooks. 3 are abstracts in foreign journals with impact factor. The other 2 are respectively 1 review in a foreign journal without impact factor and 1 review from participation in a national forum.

Dr. Kandilarova participates in the author's team of 4 textbooks: *Psychiatry* for students in Medicine, respectively in Bulgarian and English language where she is a co-author of 6 topics (3 in general and 3 in special psychiatry) as well as in *Medical Psychology* for students in Medicine in Bulgarian and English (4 co-authored topics). Being in charge of the Distance Learning, she assists in the preparation of exams and study materials.

Her personal academic work is reflected in 50 citations. All of them are in refereed journals and 49 of them are in editions with IF mostly between 3 and 6 with maximum IF - 13.382.

Evidence was provided for the applicant's participation in 2 international projects, 3 national projects (one of which has international participation) and 4 intra-university projects.

✓ **Academic activity - distribution and implementation of the academic and practical achievements of the candidate within among the academic community.**

Dr. Kandilarova participates in the competition with 24 full-text academic publications, 4 textbooks and 5 academic statements. Most of the publications are in journals with IF 9.20 and they are real publications in academic journals with impact factor. 2 in refereed journals without IF and 2 in non-indexed national journals without IF. The applicant is the first or second author in 15 of the publications. Original research articles are predominant. Where there is co-authorship, it is mostly with researchers from abroad. 4 of the articles are reviews. The academic work and publishing activity of Dr. Kandilarova can be classified in the following areas:

- *Unconventional functional MRI*

To continue the dissertation work for acquiring the academic degree "Doctor Philosophies" the applicant developed an upgraded paradigm which is used in patients with schizophrenia and depression. The results are the subject of about half of the presented publications (more than 10). Evidence for the specificity of the method of translational cross-validation of clinical psychological scales and fMRI is presented. An innovative method was used to analyze multimodal data from structural and functional imaging at rest and during task performance through multivariate analysis based on machine learning. Convincing data have been generated for successful convergent cross-validation between clinico-psychological assessment scales and fMRI images. Specific activations and brain signatures specific to different groups of patients (with paranoid and depressive syndrome) were found. Determining the contribution of different modalities concerning the differential diagnosis of schizophrenia and affective disorders has a particularly high academic value. The overall work of the applicant in this field contributes significantly for the development of methods of translational neuroscience and their use in psychiatry.

- *Conventional functional task related MRI*

The candidate developed and implemented an original block paradigm for the simultaneous use of visual stimuli from the International Affective Pictures System (IAPS) and fMRI in patients with depression and healthy controls. Significant theoretical and methodological contributions in this field are the evidence found for the advantage of the methods of

multivariate analysis in multimodal data from structural and functional magnetic resonance imaging in performing tasks over the widely used classical univariate methods.

- *Functional MRI at rest*

Some of the academic publications concern research on brain connectivity measured by fMRI at rest. In a comparative analysis between patients with depression and healthy controls, data were provided (detected by the method of spectral dynamic causal modeling) for the presence of disturbances in the functional connections between different nodes of the brain networks. The results emphasize the role of the anterior insula in the pathophysiological mechanisms of depression and receive a wide response in the literature (for a period of 2 years more than 20 citations in journals with IF up to 13.382). In a transdiagnostic study in patients with schizophrenia, bipolar and monopolar depression, potential differential diagnostic markers were found with an overall accuracy of up to 75% which is a significant contribution to finding connectivity disturbances in major mental disorders.

- *Structural MRI*

Using the quantitative method of voxel-based morphometry in a comparative study between patients with depression and healthy controls, it was found that depression is associated with a significant reduction in the volume of grey matter in certain areas located in the frontal and temporal lobes. A contribution to the research was the subsequent meta-analysis which compared depression, anxiety disorders and post-traumatic stress disorder. Disturbances specific to individual disorders have been identified.

Participation in the implementation and management of projects

The candidate participates in 2 international projects respectively with the University of Bergen Norway and the University of Lausanne, Switzerland. The first project is focused on the study of hallucinations by fMRI at rest. The results have been presented in several joint publications. The second project aims to test an innovative platform for automatic analysis of MRI data.

Dr. Kandilarova has also participated in 3 national projects (1 of them with international participation) and in 4 projects of Medical University of Plovdiv. The last are the result of collaboration with researchers from the Departments of Microbiology and Immunology, Pathological physiology and Biology.

In her work on the above mentioned projects the applicant showed outstanding skills of a researcher and a collaborator in team work.

✓ Academic and creative achievements

Dr. Kandilarova received well-deserved recognition for her academic achievements. The citations of her researches have a high citation index (Hirsch Index 7 in Scopus). She is a reviewer of prestigious journals with an impact factor - "Journal of Affective Disorders" and "Acta Radiologica". So far the applicant has 8 reviews for various national and foreign journals.

II. Assessment of the monographic work or equally presented publications

Dr. Kandilarova presents 10 original publications in refereed editions with IF. They should be considered equivalent to a monograph because they reflect the main academic interest of the applicant - study of major psychiatric diagnoses, schizophrenia and depression through magnetic resonance neuroimaging. The publications are classified into 4 areas of interest: *fMRI at rest, conventional functional MRI when performing tasks, unconventional fMRI when performing tasks - classical univariate and multivariate analyzes and structural MRI for depression.*

The main academic-theoretical and academic-practical contributions of the applicant are in the development of the methods of translational neuroscience in Bulgaria. Their use in psychiatry is focused on studying the possibilities of functional magnetic resonance imaging (fMRI) to distinguish between different psychopathological constructs. Defining the contribution of the various modalities (structure, function at rest and function when performing tasks) has high academic value for the differential diagnosis of schizophrenia and affective disorders. Functional magnetic resonance imaging (fMRI) allows successful translation between neuroimaging markers and clinical psychological/psychopathological scales. fMRI proves its quality for a very good objectification of an otherwise relatively subjective assessment of the psychiatrist based only on patient's information.

Reflection (citation) of publications in national and foreign literature (publications)

Dr. Kandilarova's academic publications have a high international impact. The achieved results are shown in a total of 50 positive citations; 49 of them are in journals with impact factor, mostly between 3 and 6. The publication defining the impaired effective connectivity of the anterior insula in depression is cited in a publication with a very high IF – 13.382. The applicant's Hirsch index is 7 according to a Scopus database check.

III. Complex qualitative evaluation of teaching activity including academic guidance for students, postgraduates and doctoral students

The applicant's teaching activity can be traced back to 2014. Dr. Kandilarova leads the practical training in psychiatry for students in Medicine and Dentistry in Bulgarian and English languages. In the last 2 years she took part in the lecture course for students in Medicine with a multimedia presentation. For the needs of teaching, she develops and conducts examination tests for regular and semestrial assessment in psychiatry. In the period 2015-2017 she held lectures and practical trainings in a course in gerontopsychiatry to students of the Medical College, specialties "Nurse" and "Midwife". She has additional commitments in the training under the Erasmus program and since 2016 in the training of general practitioners. Since 2017, she has been systematically training students, postdoctoral students and teaching staff in the methods for paradigm design and fMRI data processing. In this field, Dr. Kandilarova is a narrow specialist. Due to this in 2020 she was assigned to organize and perform specialized theoretical and practical training for students and postdoctoral students in the methods of fMRI. Since 2020 she has contributed to the practical training of psychiatrists. Dr. Kandilarova helps students, postgraduates and doctoral students to grow as researchers. This can be proved by the fact that they participate in 15 of the presented academic publications and projects.

The teaching experience of the applicant is evident in the written 4 textbooks in *Psychiatry and Medical Psychology*, respectively in Bulgarian and English.

It is evident from the academic report that for the last 3 academic years the workload of Dr. Kandilarova is much higher than the accepted norm for lecturers with medical-diagnostic activity (on average more than 200%). The taught material contains both academic achievements on the topic as well as applicant's personal professional experience in the field of psychiatry, pathopsychology, medical psychology, conventional and unconventional psychodiagnostics.

IV. Critical notes and recommendations

The presented papers for the procedure makes me see a successful professional and career development of the applicant. Considering that, I have no critical remarks but rather recommendations.

It would be very valuable that the acquired academic and practical experience of Dr. Kandilarova regarding work with fMRI becomes a practical guide, a textbook or a monograph reflecting the world and personal academic and practical experience.

I believe that Dr. Kandilarova has the qualities to be not only a successful co-author though the leading one but also to represent herself more as an independent scientist.

V. General assessment of the compliance of the applicant concerning the minimum requirements under Art. 2b, par. 2 and 3, respectively the requirements under Art. 2b, par. 5 of the LDASRB and the specific requirements for Medical University, Plovdiv by fields and units with/without clinical activity defined in the Regulations for the Academic development in Medical University, Plovdiv

The attached table shows that the candidate has covered and exceeded the minimum national requirements as well as the specific requirements for the Medical University, Plovdiv.

Indicators group	Minimum requirements	Real indicators of the applicant
Group A	50	50
Group B	100	103.37
Group C	200	244.14
Group D	100	750
Group E	60	196.7
Group F	300	677.25
Total	810	2021.46

IX. Conclusion

The candidate Dr. Sevdalina Kandilarova, MD, PhD fully meets the requirements for holding the academic position of "Associate Professor" set in LDASRB and in the Regulations for its implementation at Medical University, Plovdiv.

Based on the overall high assessment of the candidate's personality and work - career development, publishing activity and scientometric indications, teaching load and professional experience, I would kindly recommend that the Academic Jury gives positive opinion on the procedure and Dr. Kandilarova is awarded with the academic position of Associate Professor in specialty "Psychiatry" for the needs of the Department of Psychiatry and Medical Psychology at Medical University, Plovdiv.

16.12.2021
City of Varna

Reviewer: 
/Prof. Ivanka Boncheva, PhD /