

To

Mr. Chairman of the Scientific Jury / acc. Order of the Vice-Rector Prof. S. Georgiev, Medical University of Varna with № P-109-299 from 07.08.2020

Review: by Prof. Dr. Hristo Tzekov **Subject:** Conducting a competition for the academic position of "Professor" in the scientific specialty "Neurosurgery", professional field 7.1. Medicine, in the field of higher education 7. Healthcare and sports, promulgated in SG, iss. 53 / 12.06.2020

Candidate - Assoc. Prof. Dr. Vasil Hristov Karakostov, MD, neurosurgeon, Clinic of Neurosurgery at the University Hospital "St. Ivan Rilski ", Sofia

Biography of the candidate:

Assoc. Prof. Vasil Karakostov was born on October 4, 1958, in the town of Smolyan. He graduated from the Higher Medical Institute - Plovdiv in 1982. After graduation, he worked as a pediatrician at BNMP, Smolyan, a year later – he started a clinical residency in neurosurgery at the Clinic of Neurosurgery of the University Hospital "Alexandrovska" - Sofia, as in 1986 he acquired a degree in neurosurgery. In the same year he started working as a neurosurgeon at the District Hospital in Smolyan. After two years with a competition he was appointed to the position of "Assistant" at the Clinic of Neurosurgery of MU - Sofia. He subsequently held the position of "Senior Assistant" and "Chief Assistant", and then Head of Department. Since 2017 he has been the Head of the Clinic of Neurosurgery at the University Hospital "St. Iv. Rilski " - Sofia. In 2004, he defended his dissertation on the topic: "Stereotactic CT-based interventions in brain processes", attended by ONS "Doctor". Since 2007 he has been an "Associate Professor" in the scientific specialty "Neurosurgery" at the Medical University - Sofia.

As an assistant, and later as a habilitated lecturer, he led and leads exercises, seminars and lectures with students, graduate students and doctors. Participates regularly in the state examination commission for acquiring a specialty in neurosurgery as chairman and member of a commission. Conducts systematic lecture courses and exams for Bulgarian and foreign students at MU - Sofia. He also trains postgraduates and doctoral students in neurosurgery programs, as well as performs annual teaching and methodological activities related to the development of lectures, teaching aids and research projects. The classroom employment of Assoc. Prof. Dr. Vasil Hristov Karakostov, consists of conducting systematic lecture courses and exams for Bulgarian and foreign students at MU - Sofia. Lecture activity during 2019-2020r. 216,5 hours. His extracurricular employment as the Head of individual trainings from the program for specialization in "Neurosurgery" is 98 hours and the teaching methodical activity - 32 hours. Assoc. Prof. Karakostov has prepared as a supervisor two of his doctoral students, who successfully defended their dissertations for the award of ONS "Doctor" in the scientific specialty "Neurosurgery" Dr. Dilyan Valentinov Ferdinandov - in 2013. and Dr. Stiliana Ilieva Mihaylova - in 2019. He actively participates in all scientific events organized by the Society of Neurosurgery with reports and abstracts, has repeatedly moderated scientific sessions. He has completed a number of specializations in Europe and the United States. He is a member of professional and scientific

organizations in Bulgaria and abroad, including AOSpine. He is an expert at the Accreditation Council of the Ministry of Defense and at the National Health Insurance Fund. He is a member of the Expert Council on

Neurosurgery at the Ministry of Health and co-chair of the Balkan Association of Spinal Surgery. Participates regularly in the state examination commission for acquiring a specialty in neurosurgery as chairman and as a member of a commission. The total scientific production of Assoc. Prof. Dr. Vasil Karakostov includes 176 articles, full-text reports and abstracts, published in journals and abstract books of scientific events in Bulgaria and abroad. The actually published works of Assoc. Prof. Dr. Vasil Hristov Karakostov are 82 scientific works listed as follows:

Dissertations and monographs:

- dissertation work (№ 1); - "CT-based stereotactic interventions in brain processes", for the award of the scientific degree "Doctor" and thematically related publications (№№ I, 2, 3, 4, 5),

- monograph (№ 82); - "Osteoporotic and pathological vertebral fractures. Percutaneous augmentation techniques ». Published by Multiprint Ltd. Sofia 2019 p. 3-255. ISBN 978-619-188-335-6

- co-author of a chapter from a monograph (№10); - Marinov, MB, V. Karakostov.

Intraoperative monitoring of evoked potentials in neurosurgery. In the monograph: "Modern technological advances in operative neurosurgery". ed. A. Karkeselyan. Medicine and Physical Education Publishing House 1988, pp. 4-5. Indexing: COBISS.BG-ID 1100258276

Publications:

Including 79 scientific papers and reports, 5 of which have been published in scientific journals referenced and indexed in a global database and 74 in non-refereed journals, books and collections.

Of these, 25 papers and reports were published in English and 57 in Bulgarian.

In the evaluation of the total scientific production of Assoc. Prof. Karakostov and as part of the author's: - 11 scientific publications abroad in English in renowned, representative and high impact

factor Western European publications such as "Medimond S.rl", "Monduzzi Editore", Ophthalmologica, "KARGER", Acta Neurochir., Clin. Neuroradiol., J. Neurointerv Surg, J. Korean Neurosurg Soc., Supplement to Acta Neurochirurgica, CR Acad Bulg Sci, 2013, Interv Neuroradiol, 2019, Clin Neuroradiol, 2019 Acta Neurochir (Wien), 2019, Biotechnology & Biotechnological Equipment, 2020 According to the attached reference to the author's citations, 7 of these publications / № 7, 13, 36, 44, 69, 72, 75, / enjoy a high degree of positive citations, in the most representative western magazines and monographs, and so far they have been cited a total of 70 times. / ANALES D ENDOCRINOLOGIE, 64 (6): 428-433 DEC 2003, CLINICAL AND EXPERIMENTAL OPHTHALMOLOGY, 31 (3): 220-228 JUN 2003, MEDICINE, 78 (4): 236-269 JUL 1999, OPHTHALMOLOGICA 1997, VOL 211, ISS 4, pp 256-262 / Neuroradiol, 2019, 25 (1): 58-65, Acta Neurochir (Wien), 2019, 161 (5): 917-923, J Neurointerv Surg, 2019, 11 (10): 1040-1044, J Neurointerv Surg, 2020, 12 (3): 303-307.

The following groups are formed as scientific and practical directions:

- I. Dissertation for awarding the scientific and educational degree "Doctor" and related scientific papers) - four publications with №№1,2,3,4.
- II. Monograph - 1 piece
- III. Oncological diseases of the brain and spinal cord - 16 publications
- IV. Vascular diseases of the CNS-12. №№1,2,6,11,15, 16,22,23,24,
- V. Operative neurosurgery, new diagnostic and intraoperative methods and technologies - 20 pieces (№№1,2,3,4,5,6,9,10,13,15,17,22,23,25,26,28, 30,31,32,33,).
- VI. Degenerative spondylogenic diseases - 29 pieces (№№5,8,9,14,28, 33, 34,35,38,125,127,128, 91,93, 95,97,99,100, 103, 104, 105, 106, 107, 109 , 123,127,)
- VII. Malformations of the CNS - 4 pieces with № № 23,30,36,117,).
- VIII. Neurotrauma - №№ 85,86,87,90,91)
- IX. History and theory of neurosurgery, scientific information - 1 pc. (№39). X. Epilepsy - 3 pcs. (№ 39, 48,102).

The prime scientific production of Assoc. Prof. Dr. Karakostov is the candidate's dissertation "Stereotactic CT-based interventions in brain processes" (№1), which is the first in our medical literature systematic development of a large volume of its own clinical material on this topic.

The scientific and practical merits of the author's dissertation are reinforced by the fact that all the factual material included in the research is based on the direct participation of the author and under his personal guidance.

For the first time in the country, the methodology of CT-based stereotactic interventions (stereotactic biopsy, stereotactic craniotomy, stereotactic localization and stereotactic extirpation), as well as the indications for performing various types of stereos have been introduced into routine neurosurgical practice. The introduction of a "soft marker" for intraoperative determination of brain volume lesions in this variant is of a markedly original character. The technical solution and its implementation according to literature data is implemented for the first time on a national and global scale. Assoc. Prof. Karakostov introduces for the first time in our country and in the world stereotactic practice and double rotation in stereotactic biopsy with unilaterally opening forceps, which allows for taking more representative histological material, as well as to reduce the visible CT / postoperative control / lesion volume. Both innovations are presented for "patent and innovation" certification - and are in the process.

For the first time in our country the author introduces in the routine neurosurgical practice "serial stereotactic biopsy", which clearly improves the percentage of histological informativeness. With the necessary solid scientific and technical awareness and knowledge, the author publishes the exact technical characteristics of the stereotactic approaches used in view of the nature, volume and the shortest intervention path to the pathological findings. For the first time in our country a joint team applies the intraoperative combination of frame stereotaxy with endoscopy, as well as the combined use of biopsy and therapeutic localization of stereotactic interventions. The scientific interest of Assoc. Prof. Vasil Karakostov to some of the most widespread and socially significant diseases in the field of neurosurgery, such as the consequences of osteoporotic syndrome and vertebral neurooncology, is emphasized. As a natural culmination of his interest and scientific research in this field, is the publication of the monograph

"Osteoporotic and pathological vertebral fractures. Percutaneous augmentation techniques in 2019. In this book, Assoc. Prof. Karakostov describes in a very detailed and at the same time analytical way, the historical stages of the emergence and development of percutaneous techniques for augmentation of osteoporotic and pathological vertebral fractures, and their epidemiological features and specifics internationally and nationally. In this monograph the author for the first time in the Bulgarian scientific literature makes a synthesized analysis and comparison of the data on the specific incidence of osteoporosis and osteoporotic vertebral fractures in different regions of the world and compares it with that in Bulgaria. Based on his extensive clinical experience of 998 patients, he formulated his own, rather pragmatically arranged criteria for the correct selection of patients, which are suitable for performing these minimally invasive percutaneous procedures. In the monograph of Assoc. Prof. Karakostov, the central place is occupied by the description of the surgical techniques that are applied during the two percutaneous procedures for vertebral augmentation. The positive and negative sides of the technical implementation of the two procedures for vertebral augmentation are discussed quite critically, objectively and synthesized, which is of great practical importance for all surgeons who apply percutaneous vertebral augmentation. Based on his own experience and knowledge in the literature on the problem, Assoc. Prof. Karakostov quite kindly and sincerely shares his views on the critical stages in the implementation of augmentation procedures that would lead to poor operational results. The summaries and comparisons made by him in the extensive number of scientific reports that he used give him the opportunity to quite realistically assess both his own results and their value as a comparison with the results in the literature.

For the first time in the country, the author publishes and introduces in neurosurgical practice the combination of localizing stereotactic techniques and CT-guided stereotactic limited craniotomy, as a method for localization and resection of small intracranial lesions / metastases / in combination with microsurgical control and endo. (№№ -1,3,39,68,82) In the scientific production of the author there are interesting publications with casuistic pathology such as the report "Cerebral cryptococcosis - description of three cases" with leading author Assoc. Prof. Rumen Popov, which discusses a topic that with its relevance is increasingly rare and is of particular interest to specialists in neurosurgery and diagnostic imaging in the modern world. Very interesting and of great value is the publication "Primary lymphomas of the central nervous system in immunocompetent patients - report of two cases" (№79) due to the urgency of the problem for patients with hematological - oncological diseases in which neurosurgical treatment is indicated. As part of a research team led by Prof. Y.Enchev, Assoc. Prof. Karakostov published an extremely rare case of a giant, idiopathic epidermoid cyst in the AFC, "Posttraumatic giant extradural intradiploic epidermoid cysts of the posterior cranial fossa: case report and review of the literature" - published in J Korean Neurosurg Soc, which arouses great scientific interest and exceptional citation activity in the literature and at the present time. Vascular diseases of the CNS are presented in another thematic group of scientific papers, and here too can be indicated significant scientific and scientific-applied contributions of the candidate. Together with the introduction in clinical practice of the methodology of CT-stereotactic localization of small brain lesions, the author introduces for the first time in Bulgaria the

intraoperative localization of small and inaccessible / mainly with periventricular and thalamic localization / cavernous angiomas using a "soft marker". This contributes to the improvement of the postoperative results in the cases in which the method is applied / 100% completely removed cavernous angiomas without neurological deficit and without mortality /. (publications №№ -1.16)

The co-authored report, "SURGICAL TREATMENT OF THE BRAIN CAVERNOMAS LONGTERM RESULTS", presented in English at the "13th World Congress of Neurosurgery" in 2005, the author's team summarizes and analyzes its long-term work, comparing its results. in the neurosurgical practice of modern high-tech achievements - frame, frameless stereotaxy - / neuronavigation / and endoscopy. (№ -120) Definitely great scientific and practical value is the co-authorship of Dr. Karakostov in the development "Clinical manifestations and operative results in patients with cavernous vascular malformations" which analyzes the clinical manifestations and diagnostic methods in a large group of cavernous angiomas in which early CT and MRI diagnosis and subsequent microsurgery operative techniques have contributed to a marked improvement in postoperative outcomes. Very valuable and with a contribution character on a national and international regional scale, is a development dedicated to the microsurgery of arteriovenous malformations, which focuses on the impact of the epileptic syndrome. Of significant value are the publications in which the candidate is a co-author, treating the unique for the country and the first of its kind study of "intraoperative neuronavigation in microsurgical excision of cerebral vascular malformations." (publications №№ - 29,70,102.) In recent years, the author has participated in a team led by Assoc. Prof. Sirakov, which introduces and develops endovascular interventional surgery for cerebrovascular pathology. The results of the introduction of endovascular interventions / coiling of aneurysms and the embolization of AV malformations in the neurosurgery clinic of St. Rilski University Hospital are remarkable. The 9 published scientific papers have been published in the most renowned journals and have an impressive number of citations and interest in world literature (№№ 70,71,72,73,74,76,81,82). As a natural result of the specialization of Dr. Karakostov / participation in a project / on "The prognostic value of SCSEPs Changes during Intramedullary Surgery" under the guidance of Prof. Vinko Dolenz, is the writing of the chapter "Intraoperative monitoring of evoked potentials in neurosurgery" in the published monograph "Modern technological advances in operative neurosurgery" (6). The learning value of the chapter is mostly in the concise but clear and informative exposition of the matter and its modern tendencies, which makes it useful for students and specialized young neurosurgeons. Another publication has been co-authored, dedicated to the modern minimally invasive direction in neurosurgery - minimally invasive spinal surgery. In the publication 'Minimally - invasive surgery for lumbar discopathy - indications and techniques of microsurgical excision and percutaneous endoscopic discectomy "(№ 9), in addition to a brief historical overview and presentation of the basic microneurosurgical principles and techniques in spinal surgery. The new direction - microsurgical percutaneous endoscopic discectomy. A novelty in our science is the development with the participation of the author of one of the latest high-tech areas in operative neurosurgery - frameless stereotaxy (image-guided stereotaxy, neuronavigation). On this topic, everything published by the author's team at home and

abroad is the first and only for our literature and is obviously of high contribution value. As a natural continuation of the author's interests from "frame stereotaxy" comes the emphasis on the use and comparative analysis with new and advanced technologies "frameless stereotaxy -figuratively guided stereotaxy - neuronavigation" (publ. № 29,37). The author's participation in the introduction of a combined operative technique, combining conventional microsurgery with some advantages of the rigid neuroendoscope - the so-called contributing character, enriching the Bulgarian practice. Endoscopically assisted microneurosurgery (publ. №.22,23,26,37). The use of a rigid neuroendoscope by a team with the participation of the author allowed the introduction and publication of the methodology and results of fully endoscopic transsphenoidal surgery of pituitary adenomas (№ 22), as well as endoscopic three-ventriculostomy in occlusive internal hydrocephalus. The ongoing creative pursuits of the author and the maintenance of up-to-date information regarding scientific innovations led to his participation in a joint project for interinstitutional cooperation of the Department of Neurosurgery at MU-Sofia with the Neurosurgical Clinic in Münster, Germany. " *Navigated neuroendoscopy – simulation and clinical application in minimally invasive neurosurgery* ", following a series of publications on the subject (publ. №№ 31,37). In co-authorship and under the guidance of Prof. Romanski, the candidate developed for the first time in the country - in 1996 the topic of minimally invasive approaches to processes in the cerebellar hemispheres, which gives for the first time the precise accuracy, parameters and possible directions of atraumatic work on cerebellar processes in depth (№ 11). In an interdisciplinary collaboration, the author participates in the development of a completely new diagnostic method for the country for preoperative refinement of the volume, size and neuro-radiological characteristics of brain lesions. Based on the study conducted for the first time for the country, the authors conclude that the inclusion of superficial preoperative planning with the help of superficial brain scan leads to a reduced duration of the intervention and less invasive access. (№ 22). A very serious emphasis, which is present in most of the author's works, is "spondylodiscogenic, degenerative diseases" of the spine. (№№ 3,8,9,14,33,28,34,35,38,69,79,80,83,89,91,92,93,95,97,99,100,103,105,106,107,109,123,125,127,129,). The author publishes and participates in the publication of a series of scientific papers dedicated to degenerative disc pathology, introducing and promoting for the first time in the country the methodology of intradiscal "graft" prosthetics with "cage". The report "THE DISC HEIGHT SPONDYLOTIC MYELORADICULOPATHY: CLINICAL SIGNIFICANCE AND CHANCES FOR CORRECTION" at the third meeting of the Spine Experts Group / 2005, reflects the significant experience of the author and the staff of the Clinic. neurosurgery in the application of intradiscal "graft" prosthetics in the cervical and lumbar regions. № 47,50,51,54,63,65,67,72,73,74,75,76,81.). The reports - "Evaluation of percutaneous discectomy for the treatment of lumbar disc disease" (№ 93), and "Miniinvasive surgery of the lumbar spine: the choice between" microdiscectomy and percutaneous discectomy "(№ 92), presented in English at "18th EUROPEAN CONGRESS OF THE FEDERATION OF SURGEONS" in 1993, present the scientific and practical achievements of the author and the team to which he belongs and bring the achievements of Bulgarian neurosurgery to European and world standards. The reports presented in English at the Third International Meeting of the Spine Experts Group in 2005. - The

“ipsicontra” technique for treatment of degenerative lumbar spinal stenosis-surgical and radiological results, and “MISTAKES AND FAILURES OF STABILIZING OPERATION IN TORACOLUMBAR SPINE”, worthily show the current level of scientific and practical achievements of spinal surgery in Bulgaria and their make them comparable to European standards, (reports №№ 125,128). Modern surgical methods of treatment for hydrocephalus do not occupy a very large but appropriate place in the works of the candidate. The author as part of a team participates in the study and systematizes the results of this study on the diagnosis and surgical treatment of "normotensive hydrocephalus", which with its features of "insidious" developing "space-interacting process" creates a number of diagnostic and therapeutic problems. The article “NEUROENDOSCOPIC DIAGNOSIS AND TREATMENT IN ADULT PATIENTS” for the first time in the country presents and analyzes the application of pure endoscopic procedures and endoscopically assisted neurosurgical interventions in patients undergoing III normotensive / hydrocephalus and aqueductoplasty in patients with aqueduct stenosis. The development here is unique in the country and has an original contribution character, as it presents the experience of the application of the most modern endoscopicmicrosurgical techniques in intraoperative diagnosis and treatment of internal hydrocephalus in particular. (№№23,30) Most of the scientific developments, such as - "Factors influencing the effectiveness of third ventriculostomy", "Endoscopic treatment of symptomatic deep midline cysts in adults" and "OUR CLINICAL EXPERIENCE WITH CT-GUOED AND COMPUTER ASSISTED STEREOTACTIC PROCEDURES WITH ENDOSCOPIC CONTROL FOR CEREBRAL LESIONS ". frameless stereotaxy or neuronavigation and their combination with neurosurgical endoscopic microsurgical techniques - №№ 31,42,44. In the author's earlier works the problem of "Traumatic intracranial extracerebral hematomas in brain tumors." "Peripheral paresis of the facial nerve, appearing in the early period after traumatic brain injury", "Surgical evacuation of subdural hematomas through two trepanation openings" and Spontaneous intratumoral hemorrhages - their frequency, clinical significance and prognosis. (№№ 85,86,87,90,91). Here the author extensively presents the classification, pathogenesis, pathophysiology and clinical manifestation of traumatic injuries on the central and peripheral nervous system, focusing mainly on the timing, indications and surgical techniques of treatment. Includes papers-scientific information, historical essays, reviews, as well as theoretical developments in general and stereotactic neurosurgery. In the article "Stereotaxis - history and development" for the first time in the country the author discusses in great detail and extensively the stages of creation, development and progress of stereotactic science, as well as the promotion of Bulgarian scientific and practical contribution to this development, for which Dr. Karakostov has a leading role - № 29, 79.

Epilepsy and functional neurosurgery have been presented by Assoc. Prof. Karakostov since the early stages of his research. Lexel's stereotactic framework introduced by him contributes to the application of deep brain stimulation in Bulgaria. The methodology for the treatment of patients through the application of deep brain stimulation in the country was introduced in 2013. and becomes a routine neurosurgical procedure. One of the articles (№ 49) presents the first ten cases of drug-resistant epilepsy that were operated on during this period.

The technique and the results of the performed operative interventions reported by the authors of the article correspond to the highest standards published by leading centers in functional neurosurgery. Microelectrodes were used in all patients and interventions were performed in the waking conditions in order to objectively assess the effect of stimulation and to minimize the possible induction of side effects. The accuracy of all performed implants was checked with control CT and MRT imaging. All patients underwent a long follow-up period and the results were evaluated by a neurologist and a neuropsychologist. Currently, about 300 deep brain stimulation interventions have been performed at the Neurosurgery Clinic. Throughout this period, the author's knowledge of computed tomography stereotaxy with the Lars-Lexel frame has been updated by introducing an MRIbased helmet with which the necessary information for calculation and transmission on the stereotactic frame is processed by computer and has incredible accuracy. At the beginning of 2008, as part of the author's team, Assoc. Prof. Karakostov shared the initial experience of the introduction of awake craniotomy in three patients with epilepsy (№49,66), which allows mapping of functionally important areas and establishing their relationship to the epileptogenic area / lesion. The results achieved in this way allow seizure control without causing neurological deficits, even in lesions that are located in close proximity or affect a functionally important area, most often the speech area, Analyzing the results of interventions with awake craniotomy, the author and the team share their experience, which definitely leads to the conclusion that this type of intervention is an extremely powerful weapon in the hands of the surgeon, which gives confidence that the presence of additional neurological deficits will be reduced, to a minimum.

#### Participation in research projects

Assoc. Prof, Karakostov participates in two international and one national research project;

- "The prognostic Value of SCSEPs Changes during Intramedullary Surgery", 1988

"Clinical study of the drug" Temodal 't in patients with multiform glioblastoma," 20012002

Vertebral disc surgery, Epidemiological data and operational problems: 1990-1991

Assoc. Prof, Karakostov is an established and proven neurosurgeon with over 35 years of experience, received his recognition both among patients and the medical community in the country and abroad, with extremely good and sustainable results in his overall neurosurgical work.

#### Conclusion

Assoc. Prof. Dr. Vasil Karakostov, Ph.D, fully covers the minimum required and mandatory criteria, which are announced in the Law on the Implementation of the Rules of Procedure and the Rules for the Development of the Academic Staff of the Medical University - Varna. The minimum required points by groups of indicators for AD " Professor" according to the Rules for PRAS and are presented in the relevant table:

Contents	PROFESSOR	Assoc. Prof. Karakostov points
----------	-----------	--------------------------------



Indicator 1	50	50
Indicator 2		
Indicators 3,4	100	100
Sum of indicators from 5-9	200	222
Sum of indicators from 10-12	100	1340
Sum of indicators from 13 - end	100	290

His research activity has significant scientific and practical contributions, he is an authoritative lecturer and active public figure. I believe that the candidate fully meets the required mandatory criteria for acquiring the academic position of "Professor", according to ZRASRB, the Regulations for its application and PRAS of MU - Varna.

For these reasons, I find it completely justified to give my positive vote for the election of Assoc Prof, Dr, Vasil Hristov Karakostov, Ph.D. to take the academic position of "Professor" in the scientific specialty "Neurosurgery" for the needs of the Department of "Neurosurgery and ENT Diseases" at MU - Varna,

Reviewer: Prof. Dr. Hristo Tzekov, Ph.D.

20.10.2020