

Who is Who - Current Scientific Impact of the Medical Staff Affiliated at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia

Mirko Spiroski

Institute of Immunobiology and Human Genetics, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia

Abstract

Key words:

scientific papers; citation metrics; Institutes; Faculty of Medicine; Republic of Macedonia.

Correspondence:

Mirko Spiroski, MD, PhD
Institute of Immunobiology and Human Genetics, Faculty of Medicine, University "Ss. Kiril and Metodij",
1109 Skopje, PO Box 60, Republic of Macedonia

Tel.: +389-2-3110556
Fax: +389-2-3110558
ULR: <http://www.iibhg.ukim.edu.mk>
e-mail: mspiroski@yahoo.com

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Aim. The aim of this study was to investigate current individual scientific impact of the academic staff employed at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia and to create a list of Top Ten Scientists.

Material and methods. One hundred thirty nine members of the academic staff employed at the institutes, Faculty of Medicine in Skopje, Republic of Macedonia were analysed with *Harzing's Publish or Perish* software for their current individual scientific impact (October, 2009).

Results. Gordana Petrushevska from the Institute of Pathology is on the first place of Top Ten Scientists list, Aleksandar Petlichkovski from the Institute of Immunobiology and Human Genetics is on the second place, Dragica Zendelovska from the Institute of Preclinical and Clinical Pharmacology with Toxicology is on the third place, Ljudmila Efremovska from the Institute of Medical and Applied Physiology is on the fourth place. Fifth place on the Top Ten Scientists list belongs to Mirko Spiroski from the Institute of Immunobiology and Human Genetics, the sixth place to Ljiljana Bozhinovska from the Institute of Medical and Applied Physiology, the seventh place to Sloboda Dzhekova-Stojkova from the Institute of Medical, Experimental and Applied Biochemistry, the eighth place to Dejan Trajkov from the Institute of Immunobiology and Human Genetics, and the ninth and the tenth places share Emilija Janevic-Ivanovska from the Institute of Pathophysiology and Nuclear Medicine and Doncho Donev from the Institute of Social Sciences.

Conclusion. The Top Ten Scientists list comprising only members from the Institutes of the Faculty of Medicine has three members from the Institute of Immunobiology and Human Genetics, two members from the Institute of Medical, Experimental and Applied Physiology with Anthropology, and one member from each of the Institute of Pathology, Institute of Preclinical and Clinical Pharmacology with Toxicology, Institute of Medical, Experimental and Applied Biochemistry, Institute of Pathophysiology and Nuclear Medicine, and Institute of Social Sciences.

Introduction

Scientific impact of the academic staff employed at the Institutes, Faculty of Medicine in Skopje is a necessary measure of one's position on the scientific scale. It also serves as a driving force for continuous increase of the science as a whole at the Faculty of Medicine. Scientific activities of the Faculty

of Medicine in Skopje were analysed (SWOT analysis) and some conclusions were made (1).

Current scientific impact of the Institutes at the Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia was examined and it can be described as very heterogeneous - with higher, intermediate and low

scientific rate. The institutes with higher scientific impact are: Institute of Medical, Experimental and Applied Physiology with Anthropology; Institute of Immunobiology and Human Genetics; and Institute of Medical and Experimental Biochemistry (2).

On the other hand Macedonian medical journals have very limited scientific influence and their Editorial Boards are obliged to improve quality of their published manuscripts, and to adhere to international standards for scientific journals, which will result in their greater visibility and scientific influence (3).

Faculty of Medicine in Skopje needs deep structural reforms in the field of science along with other reforms in education and health protection in order to be prepared for integration in the European Union and to be a leader of the health system in the Republic of Macedonia.

The aim of this study was to investigate current scientific impact of the members of the academic staff employed at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia and to create a list of Top Ten Scientists.

Material and Methods

Academic staff at the Institutes, Faculty of Medicine

Academic staff was analyzed (139 employees) with regard to their scientific impact they have made as members of the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia. Description of the Institutes and definition of academic staff were previously published (2).

Software for Citation Metrics Analysis

This research compares the current individual scientific influence of the academic staff employed at the Institutes of the Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia. Data for the research were obtained online (October, 2009) from the public domain, using the "Harzing's Publish or Perish" software program (ver. 2.7.3499, 2009.07.30.1216U, WinNT (x86) Unicode) that retrieves and analyses academic citations of different academic authors or journals all over the world (4). The software makes use of Google Scholar to obtain the raw citation scores of various search types:

author impact analysis; journal impact analysis; and general citation search (5).

Search Strategy

Author impact analysis page was used to perform an *Advanced Scholar Search* query and to analyse its results. Several problems arise when author impact analysis search is used: i) some authors have used different names in different periods of time (Koceva Marija or Papazova Marija); ii) some authors transliterate their names in several different ways (Petrusevska G or Petrushevska G); iii) some authors add or do not add "v" (Spiroski M or Spirovski M); iv) some authors use only one of their two surnames (Korneti-Pekevaska K as Korneti K). As a result, official names of the authors affiliated with different Institutes (2) and names of the authors in the current author impact analysis are not identical.

Harzing's Publish or Perish software uses these parameters to perform a Google Scholar query. If the list of results contained similar authors from different institutions (Nikolic S, for example), citations were manually excluded from the analysis by checking or clearing the boxes in the Results list. The results are available on-screen and can also be copied to the Windows clipboard (for further applications) or saved to a text file (for future reference or further analysis) (4).

The software then analyses these results and presents a large array of statistics. For the purpose of this study, we used: (i) total number of papers, (ii) total number of citations, (iii) Hirsch's h-index, (iv) Egghe's g-index, and (v) e-index (5). Definition of the obtained statistics was previously published (2). Obtained values were transformed into rang (rang papers, rang citations, rang h-index, rang g-index, and rang e-index) with average calculation of mean rang, which serves as a scientific scale for the position of each member of the academic staff (5).

Results

The current number of published papers, rang papers, number of citations, rang of citations, h-index, rang of h-index, g-index, rang of g-index, e-index, rang of e-index, and scientific position (mean rang) by the academic staff employed at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Republic of Macedonia, are shown in Tables 1-13.

The biggest number of papers has been

Table 1: Current scientific impact of the medical staff affiliated at the Institute of Anatomy (IA), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=13) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|---------------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Korneti-Pekevka Kostadina | 5 | 23 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 20.80 |
| Tosovska-Lazarova Dobrila | 3 | 25 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 21.20 |
| Koceva (Papazova) Marija | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Strateska-Zafirovska Angja | 1 | 27 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 21.60 |
| Janevska-Nakjeva Natasha | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Jurkovic Dragica | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Matveeva Niki | 3 | 25 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 21.20 |
| Jovevska Svetlana | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Zhivadinovic-Bogdanovska Julija | 6 | 22 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 20.60 |
| Zafirova Biljana | 6 | 22 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.20 |
| Trpkovska Biljana | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Chadikovska Elizabeta | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Bojadzchieva Biljana | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |

published by the following three members of the academic staff from the Institute of Anatomy, Julija Zhivadinovic-Bogdanovska (6), Zafirova Biljana (6), and Kostadina Korneti-Pekevka (5) with only one cited paper. None of the academic staff from this

Histology and Embriology has published only one paper which is not cited, and none has h-index, g-index and e-index (zero value). That is why, the academic staff from this Institute is on the bottom of the scientific scale (23rd place) (Table 2).

Table 2: Current scientific impact of the medical staff affiliated at the Institute of Histology and Embriology (IHE), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=8) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|-----------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Milenkova Liljana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Kirovska Gracijija | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Kostovska Nevena | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Mitevska Elida | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Kakasheva-Mazhenkovska Lena | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Gerasimovska Zorka | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Milenkova Snezhana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Petrova Irena | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |

institute has value for the e-index (zero value). The current mean rang position of the academic staff at the Institute of Anatomy is very low, and they are on the 21st to 22nd position (Table 1).

The academic staff from the Institute of

Sloboda Dzhekova-Stojkova from the Institute of Medical, Experimental and Applied Biochemistry takes the first place at with 29 published papers, 43 citations and mean rang of 7.40. Three other members from this Institute are around the 10th place (Danica Labudovic, Sonja Alabakovska,

Table 3: Current scientific impact of the medical staff affiliated at the Institute of Medical, Experimental and Applied Biochemistry (IMEAB), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=13) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|------------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Dzhekova-Stojkova Sloboda | 29 | 8 | 43 | 10 | 3 | 5 | 6 | 6 | 5.10 | 8 | 7.40 |
| Todorova Bojana | 19 | 13 | 42 | 11 | 5 | 3 | 6 | 6 | 3.46 | 15 | 9.60 |
| Korenti Petraki | 19 | 13 | 27 | 16 | 3 | 5 | 4 | 8 | 2.00 | 22 | 12.80 |
| Efremovska-Aaaron Snezhana | 16 | 15 | 28 | 15 | 4 | 4 | 5 | 7 | 3.00 | 18 | 11.80 |
| Krstevska Marija | 19 | 13 | 20 | 20 | 2 | 6 | 4 | 8 | 3.46 | 15 | 12.40 |
| Labudovic Danica | 29 | 8 | 35 | 13 | 4 | 4 | 5 | 7 | 4.00 | 13 | 9.00 |
| Bosilkova Gordana | 16 | 15 | 18 | 22 | 2 | 6 | 4 | 8 | 3.46 | 15 | 13.20 |
| Bogdanska Jasna | 9 | 19 | 31 | 14 | 3 | 5 | 4 | 8 | 4.36 | 11 | 11.40 |
| Alabakovska Sonja | 25 | 10 | 38 | 12 | 4 | 4 | 5 | 7 | 4.00 | 13 | 9.20 |
| Tosheska-Trajkovska Katerina | 21 | 12 | 26 | 17 | 3 | 5 | 5 | 7 | 3.46 | 15 | 11.20 |
| Brezovska-Kavrakova Julijana | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Cekovska Svetlana | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Kostovska Irena | 1 | 27 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 21.60 |

Table 4: Current scientific impact of the medical staff affiliated at the Institute of Medical and Applied Physiology (IMAP), Faculty of Medicine, University “Ss Kiril and Metodij”, Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=15) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|--------------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Bozhinovska Lijana | 35 | 5 | 75 | 6 | 4 | 4 | 8 | 4 | 6.24 | 6 | 5.00 |
| Antevska Vaska | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Maleska-Ivanovska Vesela | 9 | 19 | 8 | 30 | 2 | 6 | 2 | 10 | 1.73 | 23 | 17.60 |
| Efremovska Ljudmila | 33 | 6 | 150 | 4 | 6 | 2 | 12 | 3 | 9.59 | 3 | 3.60 |
| Nikolij Slobodan | 4 | 24 | 5 | 33 | 2 | 6 | 2 | 10 | 1.00 | 25 | 19.60 |
| Petrovska Sunchica | 2 | 26 | 4 | 34 | 1 | 7 | 2 | 10 | 1.73 | 23 | 20.00 |
| Dejanova Beti | 3 | 25 | 5 | 33 | 2 | 6 | 2 | 10 | 1.00 | 25 | 19.80 |
| Todorovska Lidija | 5 | 23 | 3 | 35 | 1 | 7 | 1 | 11 | 1.00 | 25 | 20.20 |
| Manchevska Sanja | 7 | 21 | 3 | 35 | 1 | 7 | 1 | 11 | 1.41 | 24 | 19.60 |
| Pluncevikj-Gligorovska Jasmina | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Sivevska-Smilevska Elizabeta | 1 | 27 | 3 | 35 | 1 | 7 | 1 | 11 | 1.41 | 24 | 20.80 |
| Mickoska-Handzhiska Eli | 1 | 27 | 4 | 34 | 1 | 7 | 1 | 11 | 1.73 | 23 | 20.40 |
| Kandikjan-Kochmanova Pepica | 3 | 25 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.80 |
| Dadikj-Nikoloska Elizabeta | 3 | 25 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.80 |
| Pavlovska Kristina | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |

and Bojana Todorova) with mean rang of 9.00, 9.20, and 9.60 respectively. The next six members of the academic staff from this Institute are in the middle of the scientific scale (11th to 13th place) and the remaining members have published at least one paper (Table 3).

citations and mean rang of 5.00. The second group of academic staff (Vesela Maleska-Ivanovska, Slobodan Nikolic, Sanja Manchevska, Beti Dejanova, and Suncica Petrovska) is placed around the 20th place, and the remaining members took the 21st and

Table 5: Current scientific impact of the medical staff affiliated at the Institute of Immunobiology and Human Genetics (IIBHG), Faculty of Medicine, University “Ss Kiril and Metodij”, Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=6) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|-----------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Spiroski Mirko | 85 | 1 | 106 | 5 | 5 | 3 | 8 | 4 | 5.58 | 7 | 4.00 |
| Trajkov Dejan | 29 | 8 | 49 | 9 | 4 | 4 | 6 | 6 | 4.36 | 11 | 7.60 |
| Petlichkovski Aleksandar | 48 | 3 | 199 | 3 | 6 | 2 | 13 | 2 | 11.66 | 2 | 2.40 |
| Efinska-Mladenovska Olivija | 18 | 14 | 38 | 12 | 3 | 5 | 6 | 6 | 4.69 | 9 | 9.20 |
| Sibinovska Olgica | 5 | 23 | 6 | 32 | 1 | 7 | 2 | 10 | 2.00 | 22 | 18.80 |
| Hristomanova Slavica | 3 | 25 | 3 | 35 | 1 | 7 | 1 | 11 | 1.00 | 25 | 20.60 |

Two members of the academic staff from the Institute of Medical and Applied Physiology belong to the list of the first top ten scientists. Ljudmila Efremovska from this Institute is on the first place with 33 published papers, 150 citations and mean rang of 3.60. The second place from this Institute belongs to Lijana Bozhinovska with 35 published papers, 75

22nd place. Two members of the academic staff have not published any papers (Jasmina Pluncevic-Gligorovska and Kristina Pavlovska) (Table 4).

Three members of the academic staff from the Institute of Immunobiology and Human Genetics belongs to the Tot Ten Scientists list (Aleksandar

Table 6: Current scientific impact of the medical staff affiliated at the Institute of Pathology (IP), Faculty of Medicine, University “Ss Kiril and Metodij”, Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=12) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|--------------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Stojanovikj-Tolovska Milijana | 5 | 23 | 0 | 38 | 0 | 8 | 0 | 12 | 0,00 | 26 | 21,40 |
| Bogoeva Biljana | 16 | 15 | 5 | 33 | 1 | 7 | 2 | 10 | 2,00 | 22 | 17,40 |
| Petrushevska Gordana | 62 | 2 | 244 | 1 | 6 | 2 | 15 | 1 | 12,85 | 1 | 1,40 |
| Spasevska Lijana | 7 | 21 | 0 | 38 | 0 | 8 | 0 | 12 | 0,00 | 26 | 21,00 |
| Duganovska Snezhana | 3 | 25 | 0 | 38 | 0 | 8 | 0 | 12 | 0,00 | 26 | 21,80 |
| Janevska Vesna | 21 | 12 | 3 | 35 | 1 | 7 | 1 | 11 | 1,41 | 24 | 17,80 |
| Kochmanovska-Petreska Svetlana | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0,00 | 26 | 22,00 |
| Ristovski Milcho | 5 | 23 | 0 | 38 | 0 | 8 | 0 | 12 | 0,00 | 26 | 21,40 |
| Kostadinova-Kunovska Slavica | 11 | 17 | 2 | 36 | 1 | 7 | 1 | 11 | 1,00 | 25 | 19,20 |
| Jovanovikj Rubens | 5 | 23 | 2 | 36 | 1 | 7 | 1 | 11 | 1,00 | 25 | 20,40 |
| Filipovski Vanja | 7 | 21 | 24 | 18 | 3 | 5 | 4 | 8 | 3,87 | 14 | 13,20 |
| Bogdanovska Magdalena | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0,00 | 26 | 22,20 |

Table 7: Current scientific impact of the medical staff affiliated at the Institute of Microbiology and Parasitology (IMP), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=13) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|------------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Panovski Nikola | 22 | 11 | 16 | 23 | 2 | 6 | 3 | 9 | 2.45 | 20 | 13.80 |
| Petrovska Milena | 14 | 16 | 7 | 31 | 2 | 6 | 2 | 10 | 1.00 | 25 | 17.60 |
| Popovska-Jovanovska Kakja | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Trajkovska-Dokikj Elena | 3 | 25 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.80 |
| Jankoska Gordana | 4 | 24 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.60 |
| Kotevska Vesna | 5 | 23 | 2 | 36 | 1 | 7 | 1 | 11 | 1.00 | 25 | 20.40 |
| Cekovska Zhaklina | 10 | 18 | 2 | 36 | 1 | 7 | 1 | 11 | 1.00 | 25 | 19.40 |
| Kaftandzhieva Ana | 6 | 22 | 8 | 30 | 1 | 7 | 2 | 10 | 2.45 | 20 | 17.80 |
| Grdanoska Tatjana | 8 | 20 | 10 | 28 | 2 | 6 | 3 | 9 | 2.24 | 21 | 16.80 |
| Mirchevska Gordana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Kjurchikj-Trajkovska Biljana | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Jurhar-Pavlova Maja | 3 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |
| Labachevska Liljana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |

Petlichkovski, Mirko Spiroski, and Dejan Trajkov. Olivija Efinska-Mladenovska took the 19th place with 18 published papers, 38 citations and mean rang of 9.20. The remaining two members of the academic staff of this Institute (Olgica Sibinovska and Slavica Hristomanova) published 5 and 3 papers with 6 and 3 citations, respectively. They are on the 19th and 21st place on the scientific scale (Table 5).

Gordana Petrushevska from the Institute of Pathology is first on the Top Ten Scientists list. The second group of academic staff members from the Institute of Pathology (Vanja Filipovski, Biljana Bogoeva, Vesna Janevska, and Slavica Kostadinova-Kunovska) are placed below the 20th place on the scientific scale. The remaining academic staff members from the Institute of Pathology is on the 21st and 22nd place (Table 6).

Four members of the academic staff employed at the Institute of Microbiology and

Parasitology (Tatjana Grdanovska, Nikola Panovski, Milena Petrovska, and Ana Kaftandzhieva) are on the 17th to 18th place on the scientific scale. The remaining academic staff members of the Institute of Microbiology and Parasitology is around the 22nd place (Table 7).

Emilija Janevic-Ivanovska from the Institute of Pathophysiology and Nuclear Medicine is on the Top Ten Scientists list with mean rang of 7.80. The second group of academic staff members from this Institute (Ana Ugrinska, Boris Andonovski, and Olivija Vaskova) is placed between the 15th and 17th place (14.80, 15.40, 17.20, and 17.40 respectively). The rest of academic staff members from this Institute is between the 20th and 22nd place on the scientific scale. Several members of the academic staff from this Institute have not published any paper (Liljana Muratovska, Biljana Crcareva, and Sinisha Stojanovski) (Table 8).

Table 8: Current scientific impact of the medical staff affiliated at the Institute of Pathophysiology and Nuclear Medicine (IPNM), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=19) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|----------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Miceva-Ristevska Svetlana | 8 | 20 | 3 | 35 | 1 | 7 | 1 | 11 | 0.00 | 26 | 19.80 |
| Vaskova Olivija | 16 | 15 | 7 | 31 | 1 | 7 | 2 | 10 | 1.73 | 23 | 17.20 |
| Loparska Suzana | 12 | 16 | 7 | 31 | 1 | 7 | 2 | 10 | 1.73 | 23 | 17.40 |
| Pop-Gjorcheva Daniela | 6 | 22 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 20.60 |
| Miladinova Daniela | 2 | 26 | 5 | 33 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.60 |
| Janevic-Ivanovska Emilija | 11 | 17 | 59 | 7 | 3 | 5 | 7 | 5 | 6.48 | 5 | 7.80 |
| Bogdanovska Angelina | 5 | 23 | 2 | 36 | 1 | 7 | 1 | 11 | 1.00 | 25 | 20.40 |
| Angjeleska Meri | 1 | 27 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 21.60 |
| Majstorov Venjamin | 16 | 15 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 19.20 |
| Ugrinska Ana | 6 | 22 | 16 | 23 | 1 | 7 | 4 | 8 | 3.87 | 14 | 14.80 |
| Muratovska Liljana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Andonovski Boris | 10 | 18 | 14 | 25 | 2 | 6 | 3 | 9 | 2.65 | 19 | 15.40 |
| Kuzmanovska Sonja | 7 | 21 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 20.40 |
| Tripunovski Toni | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Zdravkovska Maja | 6 | 22 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.20 |
| Crcareva Biljana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Stojanovski Sinisha | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Ristevska Nevenka | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Zdraveska-Kochovska Marina | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |

Table 9: Current scientific impact of the medical staff affiliated at the Institute of Preclinical and Clinical Pharmacology with Toxicology (IPCPT), Faculty of Medicine, University “Ss Kiril and Metodij”, Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=15) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|---------------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Petrov Stojmir | 10 | 18 | 8 | 30 | 1 | 7 | 2 | 10 | 2.00 | 22 | 17.40 |
| Miloshevski Petar | 5 | 23 | 23 | 19 | 1 | 7 | 4 | 8 | 4.58 | 10 | 13.40 |
| Labachevski Nikola | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Slaninka-Miceska Maja | 3 | 25 | 7 | 31 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.00 |
| Trojachanec Jasminka | 2 | 26 | 5 | 33 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.60 |
| Zafirov Dimche | 4 | 24 | 6 | 32 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.00 |
| Balkanov Trajan | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Kostova-Petrova Elena | 7 | 21 | 15 | 24 | 3 | 5 | 3 | 9 | 2.24 | 21 | 16.00 |
| Jakjovski Krume | 4 | 24 | 6 | 32 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.00 |
| Zendelovska Dragica | 42 | 4 | 213 | 2 | 8 | 1 | 13 | 2 | 9.33 | 4 | 2.60 |
| Simeska Suzana | 6 | 22 | 16 | 23 | 2 | 6 | 4 | 8 | 3.32 | 16 | 15.00 |
| Kikerkov Igor | 4 | 24 | 5 | 33 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.20 |
| Atanasovska (Jovanoska) Emilija | 3 | 25 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.80 |
| Miloshevaska-Gjorgjeva Kalina | 1 | 27 | 5 | 33 | 1 | 7 | 1 | 11 | 2.00 | 22 | 20.00 |
| Petrovski Ognen | 1 | 27 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.20 |

One member of the academic staff from the Institute of Preclinical and Clinical Pharmacology with Toxicology (Dragica Zendelovska) is on the Top Ten Scientists list, with mean rang of 2.60. The second group of academic staff members from this Institute (Suzana Simeska, Petar Miloshevski, Elena Petrova, and Stojmir Petrov) is positioned between the 15th and 17th place with mean rang of 15.00, 13.40, 16.00 and 17.40 respectively. The remaining members of the academic staff from this Institute are ranked between the 19th and 22nd position on the scientific scale. All members of the academic staff from this Institute (even the youngest ones) have published at least one scientific paper (Table 9).

Rosalinda Isjanovska from the Institute of Epidemiology, Statistics and Medical Informatics is on the 16th place of scientific scale with 9 published papers and 12 citations. The rest of the academic staff from this Institute are on the 18th to 22nd place on the scientific scale (Table 10).

The first place from the Institute of Forensic Medicine and Criminalistics belongs to Aleksej Duma with 8 published papers, 19 citations and mean rang

of 13.80. The other members are distributed between the 17th and 22nd place on the scientific scale (Table 11).

Doncho Donev from the Institute of Social Medicine is on the Top Ten Scientists with mean rang of 7.80. The second place belongs to Mome Spasovski with 8 papers, 9 citations and mean rang of 17.20. The third member of this (smallest) Institute belongs to Vladimir Lazarevikj with 5 papers, 2 citations and mean rang of 20.60 (Table 12).

Current Top Ten Scientists from the Institutes, Faculty of Medicine, University “Ss Kiril and Metodij”, Republic of Macedonia are shown in Table 13.

Gordana Petrushevaska from the Institute of Pathology is on the first place of Top Ten Scientists list with 62 publications, 244 citations and mean rang of 1.40. Aleksandar Petlichkovski from the Institute of Immunobiology and Human Genetics is on the second place with 48 papers, 199 citations and 2.40 mean rang. Dragica Zendelovska from the Institute of Preclinical and Clinical Pharmacology with Toxicology is on third place with 42 papers, 213 citations and 2.60 mean rang. Ljudmila Efremovska from the

Table 10: Current scientific impact of the medical staff affiliated at the Institute of Epidemiology, Statistics and Medical Informatics (IESMI), Faculty of Medicine, University “Ss Kiril and Metodij”, Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=9) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|-----------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Danilovski Dragan | 4 | 24 | 2 | 36 | 1 | 7 | 1 | 11 | 1.00 | 25 | 20.60 |
| Vasilevska Kristin | 10 | 18 | 7 | 31 | 2 | 6 | 2 | 10 | 1.41 | 24 | 17.80 |
| Mirovska-Taushanova Biljana | 3 | 25 | 1 | 37 | 1 | 7 | 1 | 11 | 0.00 | 26 | 21.20 |
| Orovchanec Nikola | 14 | 16 | 3 | 35 | 1 | 7 | 1 | 11 | 1.00 | 25 | 18.80 |
| Zdravkovska Milka | 6 | 22 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.20 |
| Velikj-Stefanovska Vesna | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Isjanovska Rozalinda | 9 | 19 | 12 | 26 | 1 | 7 | 3 | 9 | 2.65 | 19 | 16.00 |
| Zafirova-Ivanovska Beti | 5 | 23 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.40 |
| Pavlovska Irina | 6 | 22 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.20 |

Table 11: Current scientific impact of the medical staff affiliated at the Institute of Forensic Medicine and Criminalistics (IFMC), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=13) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|-------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Duma Aleksej | 8 | 20 | 19 | 21 | 2 | 6 | 4 | 8 | 3.87 | 14 | 13.80 |
| Chakar Zdravko | 3 | 25 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.80 |
| Janeska Biljana | 4 | 24 | 5 | 33 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.20 |
| Gutevska Aleksandra | 4 | 24 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 21.60 |
| Poposka Verica | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Jakjovski Zlatko | 2 | 26 | 5 | 33 | 1 | 7 | 2 | 10 | 2.00 | 22 | 19.60 |
| Davcheva Natasha | 2 | 26 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.00 |
| Jankova Renata | 2 | 26 | 11 | 27 | 1 | 7 | 2 | 10 | 3.16 | 17 | 17.40 |
| Stankov Aleksandar | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Petrovska Suzana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Ani-Grueva Dika | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Chakar Ljupcho | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |
| Trifunova Ana | 0 | 28 | 0 | 38 | 0 | 8 | 0 | 12 | 0.00 | 26 | 22.40 |

Institute of Medical and Applied Physiology is on the fourth place with 33 papers, 150 citations and 3.60 mean rang. Fifth place on the Top Ten Scientists list belongs to Mirko Spiroski from the Institute of Immunobiology and Human Genetics with 85 papers, 106 citations and 4.00 mean rang. The sixth place belongs to Ljiljana Bozhinovska from the Institute of

Genetics with 29 papers, 49 citations and 7.60 mean rang. The ninth and tenth places share Emilija Janevic-Ivanovska from the Institute of Pathophysiology and Nuclear Medicine with 11 papers, 59 citations and Doncho Donev from the Institute of Social Sciences with 30 papers, 43 citations and 7.80 mean rang (Table 13).

Table 12: Current scientific impact of the medical staff affiliated at the Institute of Social Medicine (ISM), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

| Surname and Name (n=3) | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|------------------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Donev Doncho | 30 | 7 | 43 | 10 | 4 | 4 | 6 | 6 | 4.24 | 12 | 7.80 |
| Spasovski Mome | 8 | 20 | 9 | 29 | 2 | 6 | 3 | 9 | 2.00 | 22 | 17.20 |
| Lazarevikj Vladimir | 5 | 23 | 2 | 36 | 1 | 7 | 1 | 11 | 0.00 | 26 | 20.60 |

Medical and Applied Physiology with 35 published papers, 75 citations and 5.00 mean rang. The seventh place belongs to Sloboda Dzhekova-Stojkova from the Institute of Medical, Experimental and Applied Biochemistry with 29 papers, 43 citations and 7.40 mean rang. The eight place belongs to Dejan Trajkov from the Institute of Immunobiology and Human

Discussion

Mean rang of the scientific position of each member of the academic staff employed at the Institutes, Faculty of Medicine was calculated based on five parameters (papers, citations, h-index, g-index, and e-index). This kind of combination of

Table 13: Current top ten scientists at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia.

| Surname and Name | Affiliation | Papers | Rang papers | Citations | Rang Citations | H-index | Rang h-index | G-index | Rang g-index | E-index | Rang e-index | Scientific position - Mean rang |
|---------------------------|-------------|--------|-------------|-----------|----------------|---------|--------------|---------|--------------|---------|--------------|---------------------------------|
| Petrushevska Gordana | IP | 62 | 2 | 244 | 1 | 6 | 2 | 15 | 1 | 12,85 | 1 | 1,40 |
| Petichkovski Aleksandar | IIBHG | 48 | 3 | 199 | 3 | 6 | 2 | 13 | 2 | 11,66 | 2 | 2,40 |
| Zendelovska Dragica | IPCPT | 42 | 4 | 213 | 2 | 8 | 1 | 13 | 2 | 9,33 | 4 | 2,60 |
| Efremovska Ljudmila | IMAP | 33 | 6 | 150 | 4 | 6 | 2 | 12 | 3 | 9,59 | 3 | 3,60 |
| Spiroski Mirko | IIBHG | 85 | 1 | 106 | 5 | 5 | 3 | 8 | 4 | 5,58 | 7 | 4,00 |
| Bozhinovska Liljana | IMAP | 35 | 5 | 75 | 6 | 4 | 4 | 8 | 4 | 6,24 | 6 | 5,00 |
| Dzhekova-Stojkova Sloboda | IMEAB | 29 | 8 | 43 | 10 | 3 | 5 | 6 | 6 | 5,10 | 8 | 7,40 |
| Trajkov Dejan | IIBHG | 29 | 8 | 49 | 9 | 4 | 4 | 6 | 6 | 4,36 | 11 | 7,60 |
| Janevic-Ivanovska Emilija | IPNM | 11 | 17 | 59 | 7 | 3 | 5 | 7 | 5 | 6,48 | 5 | 7,80 |
| Donev Doncho | ISM | 30 | 7 | 43 | 10 | 4 | 4 | 6 | 6 | 4,24 | 12 | 7,80 |

IP, Institute of Pathology; IIBHG, Institute of Immunobiology and Human Genetics; IPCPT, Institute of Preclinical and Clinical Pharmacology with Toxicology; IMAP, Institute of Medical and Applied Physiology; IMEAB, Institute of Medical, Experimental and Applied Biochemistry; IPNM, Institute of Pathophysiology and Nuclear Medicine; ISM, Institute of Social Medicine.

bibliometric parameters is expected to be objective for individual measurement of the scientific impact.

A very big variation in the scientific impact between academic staff members from different Institutes, as well as individual differences inside the discipline (institute) was found. Top Ten Scientists list was created on the base of the mean rang of each member of the academic staff. On the Top Ten Scientists list from the institutes there are three members from the Institute of Immunobiology and Human Genetics, two members from the Institute of Medical, Experimental and Applied Physiology with Anthropology, and one member from each of the Institute of Pathology, Institute of Preclinical and Clinical Pharmacology with Toxicology, Institute of Medical, Experimental and Applied Biochemistry, Institute of Pathophysiology and Nuclear Medicine, and from the Institute of Social Sciences. It should be emphasised that the big differences observed between individuals cannot be interpreted as differences in quality between them without a further more specific investigation, which should focus on differences between (sub)fields and other papers published in Macedonian language in local journals.

It is well known that publications in certain disciplines are typically cited much more or much less than in others. This may be a results of several reasons, including the uneven number of cited papers per article in different fields or unbalanced cross-discipline citations (6). A typical example may be provided in the field of mathematics: the highest 2006 impact factor (IF) for journals in this category (Journal of the American Mathematical Society) is 2.55, whereas this figure is 10 times higher or more in other disciplines (for example, in 2006, New England Journal of Medicine had IF 51.30, Cell had IF 29.19, and Nature and Science had IF 26.68 and 30.03, respectively) (7). Differences found between disciplines (Institutes) at the Faculty of Medicine in Skopje, could be partly a result of different citations in those disciplines (8).

Because of the loss of citation information, comparisons based on the h-index alone can be misleading, whose total citations are much more than those of many researchers having higher h-indices; the ignored excess citations (e_2) are more than 5 times of h_2 citations. Therefore, for accurate and fair comparisons, it is necessary to use the e-index together with the h-index (9). Hirsch-index together with a couple of other bibliometric parameters for the assessment of the scientific output (h-index all papers, h-index 1st author paper, papers, citations, citations/

paper, and m) of 29 Dutch professors in clinical cardiology was explored. The results have shown that even within such a homogeneous group there is a large interindividual variability (10). If the h index is used for the evaluation of research performance, it should always be taken into account that, it is dependent on the length of an academic career and the field of study in which the papers are published and cited. For this reason, the index should only be used to compare researchers of a similar age and within the same field of study (11).

The brilliance of the h-index is that it provides a single, easy to compute, quantitative measure of one's cumulative impact. But, if one wants his/her impact to go up, he/she have to remember that all decisions in his/her career should be considered in terms of their potential to boost your h-index. Some experienced editors have made several suggestions: 1) switch fields; 2) write more reviews; 3) implement the Discreet System of Self Citation (DSSC); 4) h-index Projections; and 5) impact Caching (12).

In general, an h-index number increase with the length of time over which it is measured; hence, older scientists would usually be expected to sport h-index numbers higher than their younger counterparts (13). Probably this is one of the explanations for the individual differences in the scientific impact inside the disciplines found in this study.

In conclusion, I can say that current individual scientific impact of the academic staff employed at the Institutes of the Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia is very heterogeneous. On the Top Ten Scientists list there are three members from the Institute of Immunobiology and Human Genetics, two members from the Institute of Medical, Experimental and Applied Physiology with Anthropology, and one member each from the Institute of Pathology, Institute of Preclinical and Clinical Pharmacology with Toxicology, Institute of Medical, Experimental and Applied Biochemistry, Institute of Pathophysiology and Nuclear Medicine, and from the Institute of Social Sciences.

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References

1. Spiroski M. Report on Self-Evaluation of the Faculty of Medicine in Skopje, Republic of Macedonia (2001-2002). *Maced J Med Sci.* 2009; 2(1):5-21.
2. Spiroski M. Current Scientific Impact of the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia. *Maced J Med Sci.* 2009; 2(3):187-195.
3. Spiroski M, Gogusev J. Macedonian Medical Journals Have Very Limited Scientific Influence. *Maced J Med Sci.* 2008; 1(2):10-16.
4. Harzing AW. Australian research output in economics and business: High volume, low impact? *Au J Manage.* 2005;30(2):183-200.
5. Harzing AW. Publish or Perish, ver. 2, 2007. <http://www.harzing.com/pop.htm>.
6. Althouse BM, West JD, Bergstrom T, Bergstrom CT. Differences in impact factor across fields and over time. *arXiv.* 2008;0804.3116v1.
7. Garfield E. *Citation Indexing. Its Theory and Applications in Science, Technology, and Humanities.* New York: Wiley, 1979.
8. Radicchi F, Fortunato S, Castellano C. Universality of citation distributions: toward an objective measure of scientific impact. *Proc Natl Acad Sci USA.* 2008;105(45):17268-72. PMID:18978030
9. Zhang CT. The e-index, complementing the h-index for excess citations. *PLoS One.* 2009;4(5):e5429. PMID:19415119
10. Opthof T, Wilde AA. The Hirsch-index: a simple, new tool for the assessment of scientific output of individual scientists: The case of Dutch professors in clinical cardiology. *Neth Heart J.* 2009;17(4):145-54. PMID:19421360
11. Bornmann L, Daniel HD. The state of h index research. Is the h index the ideal way to measure research performance? *EMBO Rep.* 2009;10(1):2-6. PMID:19079129
12. Williamson JR. My h-index turns 40: my midlife crisis of impact. *ACS Chem Biol.* 2009;4(5):311-3. PMID:19441857
13. Jeang KT. H-index, mentoring-index, highly-cited and highly-accessed: how to evaluate scientists? *Retrovirology.* 2008;5:106. PMID:19032780