

**OPEN ACCESS MACEDONIAN  
JOURNAL OF MEDICAL SCIENCES**

**oa  
mjms** eISSN 1857-9655  
<https://www.id-press.eu/mjms>



Open Access Maced J Med Sci (OAMJMS) is an international peer-reviewed, Open Access journal published four times per year. **Indexed in:** Bielefeld Academic Search Engine (BASE), CAB Direct, CiteFactor, CNKI Scholar, CrossRef DOI, DeepDyve, Directory of Open Access Journals (DOAJ), Directory of Open Access scholarly Resources (ROAD), Europe PMC, Global Health database, Global Impact Factor (GIF), Google Scholar, Harvard Library [HOLLIS +], HINARI Access to Research Initiative, JournalTOCs, Mendelley, NLM Catalog, OpenAIRE, Open Academic Journals Index (OAJI), Open Access Library (OALib), pubget, PubMed, PubMed Central, PubMed Central CANADA, SciLit, SciRew, Scopus, SouthEast European Science Advanced through Evaluation (SEESAmE), The Knowledge Network, Virtual Library of Macedonia (COBISS.MK), Western Theological Seminary, WorldCat. **Publisher:** ID Design Press, Rajko Zhinzifov No. 48, 1000 Skopje, Republic of Macedonia. OAMJMS Online (eISSN 1857-9655) offers free access to all articles at <https://www.id-design.eu/mjms/>

## Editorial Team

### Editors-in-Chief

Prof. Dr Mirko Zhivko Spiroski, Faculty of Medicine, Ss Cyril and Methodius University of Skopje, Skopje, Republic of Macedonia, Republic of Macedonia

Prof. Dr Doncho Donev, Institute of Social Medicine, Medical Faculty, Ss Cyril and Methodius University of Skopje, Skopje, Republic of Macedonia

Prof. Dr Olivera Stojceva-Taneva, University Clinic of Nephrology, Republic of Macedonia

### Deputy Editors-in-Chief

Dr Borislav D Dimitrov, Academic Unit of Primary Care and Population Sciences Faculty of Medicine University of Southampton South Academic Block (Level C) Southampton General Hospital Southampton SO166YD England, UK

MD, MSc, PhD, MRCPsych Elizabeta Mukaetova-Ladinska, Old Age Psychiatry, Newcastle University, United Kingdom

MD, PhD candidate Marko Spasov, University Clinic of Traumatology, Orthopaedics, Anesthesia, Reanimation, Intensive Care and Emergency Department; Medical Faculty, Skopje., Republic of Macedonia

MD, MSc Sasho Stoleski, Institute for Occupational Health of Republic of Macedonia - Skopje, WHO Collaborating Center, GA2LEN Collaborating Center, II Makedonska brigada 43, 1000 Skopje, Republic of Macedonia

### Layout Editor and Electronic Publishing

MSc, Eng Ivo Spiroski, ID Design 2012, Skopje, Republic of Macedonia

### Evidence Based Medicine

Prof. Dr. Katarina Stavric, Children Hospital Skopje, Macedonia, Vodnjanska 17, University "Ss Cyril and Methodius", Skopje, Republic of Macedonia

### Editorial Board

DDS, MS, PhD, Associate Professor Nikola Angelov, Director of the Pre-Doctoral Periodontics Clinic, Loma Linda University School of Dentistry, Department of Periodontics. Loma Linda, CA, 92350, United States

Assist. Prof. Dr. Ramush Bejiqi, University Clinical Centre of Kosovo, Paediatric Clinic, Albania

Prof. Semra Čavaljuga, Department of Epidemiology and Biostatistics, Faculty of Medicine, Sarajevo, Bosnia and Herzegovina

MD Pei-Yi Chu, Diagnostic and research pathologist, Department of Surgical Pathology, Changhua Christian Hospital, Taiwan. Address: 135 Nan-Shiao Street, Changhua 500-06., Taiwan, Province of China

MD, PhD Ivo Donkov, Staff Urologist, Lincoln County Hospital, United Kingdom

Prof. Dr. Aleksandar Dimovski, Institute of Pharmaceutical Chemistry, Faculty of Pharmacy, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia

MD, PhD Andrew J. Dwork, Departments of Pathology and Cell Biology and Psychiatry, College of Physicians and Surgeons of Columbia University; Division of Molecular Imaging and Neuropathology, New York State Psychiatric Institute, Unit 62, 722 West 168th Street, New York, NY 10032, United States

MD, PhD Dimitar G. Efremov, Molecular Hematology, International Centre for Genetic Engineering and Biotechnology (ICGEB), Rome, Italy

Adriana Galan, Department of Health Programmes and Health Promotion, Institute of Public Health, Bucharest, Romania

Prof. Tania Santos Giani, Estacio de Sa University, in Health Sciences, Brazil

PhD Iva Ivanovska, Harvard Medical School, Department of Genetics, 77 Avenue Louis Pasteur, NRB room 239, Boston, MA 02115, United States

MD, PhD Jerzy Jablęcki, Associate Professor, Division of General Surgery St. Jadwiga of Silesia Hospital, Trzebnica; Head, Subdepartment of Hand Surgery an Replantation St Jadwiga of Silesia Hospital, Trzebnica; Professor,

Department of Public Health, State Higher Professional Medical School, Opole, Poland. 55-100 Trzebnica, ul. Prusicka 53, Poland

MD Mehrdad Jalalian Hosseini, Khorasan-e Razavi Blood Center, Mashhad, Iran, Islamic Republic of

PhD Radka Kaneva, Department of Medical Chemistry and Biochemistry, Medical University - Sofia, Bulgaria

Prof. Dr. Kostandina Leonida Kometi-Pekevka, Ss Cyril and Methodius University of Skopje, Faculty of Medicine, Skopje, Republic of Macedonia

MD, PhD Branko Malenica, Department of Immunology, Clinical Hospital Center Zagreb, Zagreb University School of Medicine, Zagreb, Croatia

Prof. Dr. Elida Mitevska, Institute of Histology and Embriology, Faculty of Medicine, Ss Cyril and Methodius University of Skopje, Skopje, Republic of Macedonia

MD, PhD Marija Mostarica-Stojković, Institute of Microbiology and Immunology, University of Belgrade School of Medicine, Belgrade, Serbia

PhD Vesna Nikolova-Krstevska, Harvard Institutes of Medicine, HIM-201, 4 Blackfan Circle, Boston, MA, 02134, United States

Prof. Dr. Nikola Panovski, Institute of Microbiology and Parasitology, Faculty of Medicine, Skopje, Republic of Macedonia

MD, BIDMC Iva Petkovska, Beth Israel Deaconess Medical CenterRadiology W CC - 3 330 Brookline Ave. Boston, MA 02215, United States

Prof. Dr. Gordana Petrushevska, Institute of Pathology, Medical Faculty, University of "Ss. Cyril and Methodius" – Skopje, Republic of Macedonia

Prof. Enver Roshi, Dean of Faculty of Public Health, Medical University of Tirane, Chief of Epidemiological Observatory, National Institute of Public Health. Address: Rruga e Dibres, Str. 371, Tirana, Albania

MD, PhD Gorazd B. Rosoklija, Professor at Columbia University and member of the Macedonian Academy of Sciences and Arts, United States

Prof. Dr. Aleksandar Sikole, University Clinic for Nephrology, Faculty of Medicine, Ss Cyril and Methodius University of Skopje, Skopje, Republic of Macedonia

MD, FESC Gianfranco Sinagra, Department of Cardiology, "Ospedali Riuniti" and University of Trieste, Ospedale Cattinara – Strada di Fiume, 447, 34149 – Trieste, Italy

MD, PhD Rumen Stefanov, Information Centre for Rare Diseases and Orphan Drugs (ICRDOD), Bulgaria; Department of Social Medicine, Medical University of Plovdiv, Bulgaria

Prof. Dr. Vesna Velikj-Stefanovska, Department of Epidemiology and Biostatistics with Medical Informatics, Medical Faculty, UKIM, Skopje, Republic of Macedonia

MD, MBA Milenko Tanasijevic, Director, Clinical Laboratories Division and Clinical Program Development, Pathology Department, Brigham and Women's Hospital, Dana Farber Cancer Institute, Associate Professor of Pathology, Harvard Medical School, United States

PhD Mirko Trajkovski, ETH Zürich, Wolfgang-Pauli-Str. 16/HPT D57, 8093 Zürich-CH, Switzerland

MD, FRCPC Kiril Trpkov, Associate Professor, University of Calgary, Department of Pathology and Laboratory Medicine, Calgary Laboratory Services. 7007 14 st, Calgary SW, Canada

MD, PhD Igor Tulevski, Department of Cardiology, Academic Medical Center, Amsterdam, 1100 DD, T 020 707 2930; F 020 707 2931, Netherlands

PhD Zoran Zdravkovski, Institute of Chemistry, Faculty of Natural Sciences and Mathematics, Ss Cyril and Methodius University of Skopje, Skopje, Republic of Macedonia

### Editorial Office

ID Design 2012/DOOEL Skopje, Rajko Zhinzifov No. 48, 1000 Skopje, Republic of Macedonia | Telephone: +389 70 255155. | e-mail: [mSpiroski@id-design.eu](mailto:mSpiroski@id-design.eu) | URL: <http://www.id-design.eu/mjms/>

### Publisher

ID Design Press, Rajko Zhinzifov No. 48, 1000 Skopje, Republic of Macedonia