

# www.TurkJBiochem.com

# TÜRK BİYOKİMYA DERGİSİ

## Turkish Journal of Biochemistry

VII. Türkiye *in vitro*Diyagnostik (IVD)
Sempozyumu:
İnflamasyon
27-29 Nisan 2022 İzmir

VII. Turkey *in vitro*Diagnostic (IVD)
Symposia:
Inflammation
27-29 April 2022 Izmir

Türk Biyokimya Derneği'nin yayın organıdır. [Published by the Turkish Biochemical Society]

2022
Cilt [Volume] 47
Ek Sayı [Supplement] 1

### YER ALDIĞI İNDEKSLER [INDEXED BY]

SCI Expanded,
Journal Citation
Reports/Science
Edition, Chemical
Abstracts, Index
Copernicus,
Embase, Scopus,
Ulakbim Türk
Tıp Dizini,
Ulrich's Periodical
Directory, EBSCO,
Turkey Atıf Dizini

# TURKISH JOURNAL OF BIOCHEMISTRY TÜRK BİYOKİMYA DERGİSİ

OFFICIAL JOURNAL OF THE TURKISH BIOCHEMICAL SOCIETY

### **EDITOR IN CHIEF [BAŞ EDİTÖR]**

Doğan Yücel, Ankara, TR

### VICE EDITORS [YARDIMCI EDITÖRLER]

Aylin Sepici Dinçel, Ankara, TR Merve Sibel Güngören, Ankara, TR Oytun Portakal, Ankara, TR Muhittin Serdar, Ankara, TR Mehmet Senes, Ankara, TR

### ASSOCIATE EDITORS [BÖLÜM EDITÖRLERI]

Sedat Abuşoğlu, Konya, TR
Ebubekir Bakan, Erzurum, TR
Sreeparna Banerjee, Ankara, TR
Emine Bayraktar, Ankara, TR
Ebru Bodur, Ankara, TR
Murat Bolayırlı, İstanbul, TR
Abdurrahman Coşkun, İstanbul, TR
Özlem Dalmızrak, Nicosia, TRNC
Birsen Can Demirdöğen, Ankara, TR

Suat Erdoğan, Edirne, TR Uzay Görmüş, Solna, SE Levent Kayrın, Kyrenia, TRNC Semra Koctürk, İzmir, TR Isil Aksun Kurnaz, Kocaeli, TR Melek Özkan, Kocaeli, TR Yesim Özkan, Ankara, TR Ebru Saatçi, Kayseri, TR Çağdaş Son, Ankara, TR Alaattin Şen, Denizli, TR Ajlan Tükün, Ankara, TR Hamdi Uysal, Ankara, TR Serenay Elgün Ülkar, Ankara, TR Süha Yalçın, İstanbul, TR İlhan Yaylım, İstanbul, TR Fatma Meriç Yılmaz, Ankara, TR Meral Yüksel, Istanbul, TR

### STATISTICS EDITORS [ISTATISTIK EDITÖRLERI]

Erdal Coşgun, Redmond, WA, USA Sevilay Karahan, Ankara, TR Jale Karakaya, Ankara, TR

### TECHNICAL EDITORS (TEKNIK EDITÖRLER)

Tülin Bayrak, Ordu, TR Birsen Can Demirdöğen, Ankara, TR Merve Sibel Güngören, Ankara, TR Elvan Laleli Şahin, Dallas, USA Duygu Şahin, Istanbul, TR Z. Onur Uygun, İzmir, TR Oğuzhan Zengi, İstanbul, TR

### **CORRESPONDENCE [YAZI İŞLERİ]**

Nermin Şahan, Ankara, TR

### **DE GRUYTER**

### EDITORIAL BOARD [EDITÖRLER KURULU]

Erdal Karaöz, Department of Histology and Embryology, Faculty of Medicine, İstinye University, İstanbul, TURKEY

Reşat Apak, Department of Chemistry, Faculty of Engineering, İstanbul University Cerrahpaşa Research Information System, İstanbul, TURKEY Khosrow Adeli, Molecular Medicine, Research Institute, The Hospital for Sick Children, University of Toronto, Toronto, Ontario, CANADA Diler Aslan, Department of Biochemistry, Faculty of Medicine, Pamukkale University, Denizli, TURKEY

Cumhur Bilgi, Department of Medical Biochemistry, University of Yüksek İhtisas, Ankara, TURKEY

Anyla Bulo-Kasneci, Laboratory Department, University Hospital Center "Mother Teresa", Tirana, ALBANIA

Orhan Değer, Department of Medical Biochemistry, Faculty of Medicine, Karadeniz Technical University, Trabzon, TURKEY Elif Demirkan, Department of Biology, Faculty of Arts & Sciences, Uludağ University, Bursa, TURKEY

Z. Günnur Dikmen, Department of Biochemistry, Faculty of Medicine, Hacettepe University, Ankara, TURKEY

Miral Dizdaroğlu, National Institute of Standards and Technology, Gaithersburg, MD, USA

Mustafa B. A. Djamgoz, Department of Life Sciences, Faculty of Natural Sciences, Imperial College, London, UNITED KINGDOM Figen Erkoç, Department of Biology Education, Faculty of Gazi Education, Gazi University, Emeritus, Ankara TURKEY Gökhan Hotamişligil, Department of Genetics and Complex Diseases, Harvard School of Public Healt, Boston, USA

Mehmet Kesimer, Department of Pathology and Laboratory Medicine, Marsico Lung Institute, University of North Carolina at Chapel Hill, NC, USA

İrfan Küfrevioğlu, Department of Chemistry, Faculty of Art & Sciences, Atatürk University, Erzurum, TURKEY

Nada Majkic-Singh, Institute of Medical Biochemistry, Pharmaceutical Faculty and Clinical Centre of Serbia, Belgrade, SERBIA Gülgün Oktay, Department of Medical Biochemistry, Faculty of Medicine, University of Dokuz Eylül, İzmir, TURKEY

İ. Hamdi Öğüş, Department of Medical Biochemistry, Faculty of Medicine, Near East University, Nicosia, Emeritus, TRNC

Yeşim Özarda, Department of Medical Biochemistry, Faculty of Medicine, Uludağ University, Bursa, TURKEY

Tomris Özben, Department of Medical Biochemistry, Faculty of Medicine, Akdeniz University, Antalya, TURKEY

Nazmi Özer, Faculty of Pharmacy, Girne American University, Nicosia TRNC

 $\it Israel Pecht$ , Department of Immunology, Weizmann Institute of Science, Rehovot, ISRAEL

Mario Plebani, Department of Medical Sciences, University of Padova, Padova, ITALY

Demetrios Rizos, Hormonal and Biochemical Laboratory, Aretaieio Hospital, University of Athens, Athens, GREECE

George Russev, Bulgarian Academy of Sciences, Institute of Molecular Biology, Sofia, BULGARIA

Fahri Saatçioğlu, Department of Biosciences, University of Oslo, Oslo, NORWAY

Ferhan Girgin Sağın, Department of Medical Biochemistry, Faculty of Medicine, Ege University, İzmir, TURKEY

Aziz Sancar, Department of Biochemistry and Biophysics, University of North Carolina School of Medicine, Chapel Hill, NC, USA Praveen Sharma, All India Institute of Medical Sciences, Jodhpur, INDIA

Emin Sofic, Department of Chemistry, Faculty of Science, Sarajevo University, Sarajevo, BOSNIA AND HERZEGOVIA

Eser Sözmen, Department of Medical Biochemistry, Faculty of Medicine, University of Ege, İzmir, TURKEY

Abdullah Tuli, Department of Medical Biochemistry, Faculty of

Medicine, Çukurova University, Adana, TURKEY Ali Ünlü, Department of Biochemistry, Faculty of Medicine, Selçuk

University, Konya, TURKEY Sedef Yenice, Department of Clinical Chemistry, Group Florence Nightingale Hospitals, İstanbul, TURKEY

Turkish Journal of Biochemistry (TJB), official journal of Turkish Biochemical Society, is issued electronically every 2 months. Research articles, reviews, short communications, technical reports, case presentations, opinions, and letters to the editor, that have not published elsewhere, on biochemistry, clinical biochemistry, molecular biology, molecular genetics, biotechnology, bioinformatics, bioengineering, and their educational disciplines are published in the journal.

The main aim of the journal is to support the research and publishing culture by ensuring that every published manuscript has an added value and thus providing international acceptance of the "readability" of the manuscripts published in the journal.

e-ISSN 1303-829X

All information regarding notes for contributors, subscriptions, open access, back volumes and orders is available online at www.degruyter.com/view/j/tjb.

RESPONSIBLE EDITOR Doğan Yücel PhD, Assoc Professor of Biochemistry, Department of Medical Biochemistry, Ankara Training and Research Hospital, University of Health Sciences, 06340, Ankara, Turkey, Tel: +90312 595 321, Email: doyucel@yahoo.com

**JOURNAL COORDINATOR** Heike Jahnke, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany. Tel.: +49 (0) 30 260 05–220, Email: heike.jahnke@degruyter.com

RESPONSIBLE FOR ADVERTISEMENTS Markus Kügel, De Gruyter, Rosenheimer Str. 143, 81671 Munich, Germany, Tel.: +49 89 76 902-424, e-mail: anzeigen@degruyter.com

TYPESETTING TNQ Technologies, Chennai, India