Ibnosina Journal of Medicine and Biomedical Sciences

The Official Publication of The Libyan Biotechnology Research Center

Editor-in-Chief
Dr. Elmahdi A. Elkhamsas, MD, FACS
Professor Emeritus
Department of Surgery
Division of Transplant Surgery
The Ohio State University,
Columbus, Ohio, United States

Deputy Editor
Dr. Salem A Beshyah, DIC, PhD, FRCP
Adjunct Professor of Clinical Research and Metabolic Medicine,
Dubai Medical College (DMC), Dubai,
United Arab Emirates
Consultant Endocrinologist, Yas Clinic Khalifa City and Abu Dhabi Stem cell Center,
Abu Dhabi, United Arab Emirates
Adjunct Clinical Professor, College of Medicine and Health Sciences, Khalifa University

Associate Editors
Dr. Elhadi Aburawi, MB BCh, FRCPCH, FAAC,
FRCP, MSc, PhD
Professor, Department of Pediatrics,
Co-Chair, Scientific Committee, Large Animal Laboratory, College of Medicine and Health Sciences,
United Arab Emirates University
P.O. Box 15551, Al-Ain, United Arab Emirates

Dr. Abdul fattah A. Lakhdar, MSc, FRCP
Consultant Physician in Diabetes and Endocrinology,
Barts Health NHS Trust,
London, United Kingdom

Dr. Khalid Mumtaz, MD
Associate Professor-Clinical, Gastro,
Hepatology & Nutrition
395 W 12th Avenue, 2nd floor
Columbus, OH 43210, United States

Members of the Editorial Board
Dr. Issam Mehdi Hajjaji, MBCh, BAO, MA,
FRCP, FRCP
Professor, Department of Medicine,
Faculty of Medicine,
University of Tripoli, Libya
Tripoli, Libya

Dr. Nureddin Ashammakhi, MBBS, PhD
Adjunct Associate Professor, Department of Radiological Sciences, David Geffen School of Medicine at UCLA, Los Angeles,
CA 90095, United States
Affiliate Faculty, Department of Biomedical Engineering, Henry Samueli School of Engineering at UCLA,
Los Angeles, CA 90095, United States

Dr. Adam I. Elzahheid, PhD
Professor of Pathology and Managing Director
Genetic Engineering Department,
Biotechnology Research Centre, Tripoli, Libya

Dr. Awad G. Abdellatif, PhD
Professor of Pharmacology,
Faculty of Medicine,
University of Benghazi
Benghazi, Libya

Dr. Hussain Alsaffar, FRCPCH
Consultant and Senior Lecturer,
Pediatric endocrinology and Diabetes,
Sultan Qaboos University Hospital,
Muscat, Oman
Faculty of Biology, Medicine and Health,
University of Manchester, Manchester,
United Kingdom

Dr. Rajaie A. Namas, MD
Staff Physician, Department of Rheumatology,
Medical Subspecialties Institute,
Cleveland Clinic Abu Dhabi, Abu Dhabi, United Arab Emirates

Dr. Samir B. Kahwash, MD
Professor-Clinical, The Ohio State University
Associate Chief for Education
Department of Pathology and Laboratory Medicine,
Nationwide Children’s Hospital,
Department of Pathology, Nationwide Children’s Hospital,
700 Children’s Drive,
Columbus OH 43205, United States

Alexander Woodman, PhD, MPH, MSc
Head of Scientific Research Department,
King Fahad Military Medical Complex,
Saudi Arabia

Dr. Nazeer Khan, PhD (Statistics Advisor)
Professor of Biostatistics,
Department of Research,
Jinnah Sindh Medical University,
Rafiqui H.J. Shaheed Road,
Karachi, 75510 Pakistan

© 2023. The Libyan Biotechnology Research Center. All rights, including the rights of publication, distribution, and sales, as well as the right to translation, are reserved. No part of this work covered by the copyrights hereon may be reproduced or copied in any form or by any means — graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems — without written permission of the publisher. Ibnosina Journal of Medicine and Biomedical Sciences is published 4 times a year in March, June, September, and December by Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India, marketing@thieme.in. Ibnosina Journal of Medicine and Biomedical Sciences is indexed in Emerging Sources Citation Index, EBSCO, and ProQuest. Thieme Medical Publishers is a member of the CrossRef initiative. Editorial comments should be sent to journals@thieme.com. The content of this journal is available online at www.thieme-connect.com/products. Visit our Web site at www.thieme.com and the direct link to this journal at www.thieme.com/jijms.

Typesetting: Thomson Digital, Noida, India
Printing and Binding: Replika Press Pvt. Ltd.
Printed in India