ISSN: 1937-6871 Volume 11, Number 12, December 2018



JBISE



Journal Editorial Board

ISSN 1937-6871 (Print) ISSN 1937-688X (Online)

http://www.scirp.org/journal/jbise

Editors-in-Chief

Prof. Wei Chen North China University of Science and Technology, China

Prof. Hao Lin University of Electronic Science and Technology of China, China

Honorary Editor-in-Chief

Prof. Kuo-Chen Chou Gordon Life Science Institute, San Diego, California, USA

Editorial Board

Prof. Christopher J. Branford-White London Metropolitan University, UK

Prof. Thomas Casavant University of Iowa, USA

Dr. Feng ChengUniversity of South Florida, USAProf. Senshi FukashiroThe University of Tokyo, JapanProf. Dayong GaoUniversity of Washington, USA

Dr. Ernesto Goldman Ohio State University Wexner Medical Center, USA

Prof. Reba GoodmanColumbia University, USAProf. Ridha HambliOrleans University, FranceDr. Zeng-Jian HuHoward University, USA

Prof. Takeshi KikuchiRitsumeikan University, JapanProf. Rob KramsImperial College London, UKDr. Lukasz KurganUniversity of Alberta, CanadaProf. Juan LiuWuhan University, China

Dr. Girdhar K. Pandey University of Delhi South Campus, India

Prof. Panagote (Panos) M. Pardalos University of Florida, USA

Prof. Kota V. Ramana University of Texas Medical Branch, USA

Dr. Likun Tan Scientific Forming Technologies Corporation, USA

Dr. Yanmei Tie Harvard Medical School, USA

Prof. Giuseppe VairoUniversity of Rome "Tor Vergata", ItalyProf. Zhizhou ZhangHarbin Institute of Technology, China



ISSN Online: 1937-688X ISSN Print: 1937-6871

Table of Contents

Journal of Biomedical Science and Engineering (JBiSE) Journal Information

SUBSCRIPTIONS

The *Journal of Biomedical Science and Engineering* (Online at Scientific Research Publishing, www.SciRP.org) is published monthly by Scientific Research Publishing, Inc., USA.

Subscription rates:

Print: \$89 per issue.

To subscribe, please contact Journals Subscriptions Department, E-mail: sub@scirp.org

SERVICES

Advertisements

Advertisement Sales Department, E-mail: service@scirp.org

Reprints (minimum quantity 100 copies)

Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.

E-mail: sub@scirp.org

COPYRIGHT

Copyright and reuse rights for the front matter of the journal:

Copyright © 2018 by Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY).

http://creativecommons.org/licenses/by/4.0/

Copyright for individual papers of the journal:

Copyright © 2018 by author(s) and Scientific Research Publishing Inc.

Reuse rights for individual papers:

Note: At SCIRP authors can choose between CC BY and CC BY-NC. Please consult each paper for its reuse rights.

Disclaimer of liability

Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained herein. We expressly disclaim any implied warranties of merchantability or fitness for a particular purpose. If expert assistance is required, the services of a competent professional person should be sought.

PRODUCTION INFORMATION

For manuscripts that have been accepted for publication, please contact:

E-mail: jbise@scirp.org

Journal of Biomedical Science and Engineering (JBiSE)

http://www.scirp.org/journal/jbise

JBiSE, an international journal, publishes research and review articles in all important aspects of biology, medicine, engineering, and their intersection. Both experimental and theoretical papers are acceptable provided they report important findings, novel insights, or useful techniques in these areas. All manuscripts must be prepared in English, and are subject to a rigorous and fair peer-review process. Accepted papers will immediately appear online followed by printed in hard copy.

Subject Coverage

- Applied Biomaterials
- Bioelectrical and Neural Engineering
- Bioinformatics and Computational Biology
 Biomechanics and Biotransport
- Biomedical and Environmental Sciences
 Biomedical Chemistry

- Biomedical Chromatography
 Biomedical Devices, Sensors, Artificial Organs and Nano Technologies
- Biomedical Engineering
 Biomedical Imaging, Processing and Visualization
- Biomedical Informatics
- Biomedical Materials
- Biomedical Microdevices
- Biomedical Modeling
- Biomedical Sciences and Applications
- Biomedical Semantics
- Biomedical Signal Processing and Control
- Biomedicine and Biotechnology
- Biomedicine and Pharmacotherapy
- Clinical Engineering, Wearable and Real-Time Health Monitoring Systems
- Computer Methods and Programs in Biomedicine
- Genetic Engineering
- History and Philosophy of Biomedical Sciences
- Mechanical Behavior of Biomedical Materials
- Medical Biochemistry
- Medical Cell Biology Molecular and Genetic Medicine
- Nano-Bio-Analysis Negative Results in Biomedicine
- ●NMR in Biomedicine ●NMR/CT/ECG Technologies and Electromagnetic Field Simulation
- Nonlinear Biomedical Physics
- Numerical Methods in Biomedical Engineering
 Pharmaceutical and Biomedical Analysis
 Physiological Signal Processing

 Proteomica

- Proteomics
- Software, Tools and Application in Medical Engineering
- Structure-Based Drug Design

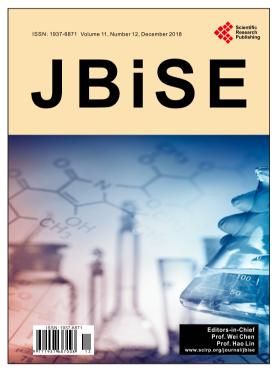
Notes for Intending Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Paper submission will be handled electronically through the website. All papers are refereed through a peer review process. For more details about the submissions, please access the website.

Website and E-Mail

http://www.scirp.org/journal/jbise

Email: jbise@scirp.org



Editors-in-Chief

Prof. Wei Chen

Prof. Hao Lin

North China University of Science and Technology University of Electronic Science and Technology of China, China

Honorary Editor-in-Chief

Prof. Kuo-Chen Chou

Gordon Life Science Institute, San Diego, California, USA

Editorial Board

Prof. Christopher J. Branford-White

Prof. Thomas Casavant

Dr. Feng Cheng Prof. Senshi Fukashiro

Prof. Davong Gao

Dr. Ernesto Goldman

Prof. Reba Goodman Prof. Ridha Hambli

Dr. Zeng-Jian Hu

Prof. Takeshi Kikuchi

Prof. Rob Krams

Dr. Lukasz Kurgan

Prof. Juan Liu

Dr. Girdhar K. Pandey Prof. Panagote (Panos) M. Pardalos

Prof. Kota V. Ramana Dr. Likun Tan

Dr. Yanmei Tie

Prof. Giuseppe Vairo Prof. Zhizhou Zhang

London Metropolitan University, UK University of Iowa, USA University of South Florida, USA The University of Tokyo, Japan University of Washington, USA

Ohio State University Wexner Medical Center, USA

Columbia University, USA Orleans University, France

Howard University, USA Ritsumeikan University, Japan

Imperial College London, UK University of Alberta, Canada

Wuhan University, China

University of Delhi South Campus, India University of Florida, USA

University of Texas Medical Branch, USA Scientific Forming Technologies Corporation, USA

Harvard Medical School, USA University of Rome "Tor Vergata", Italy Harbin Institute of Technology, China

ISSN 1937-6871 (Print), 1937-688X (Online)

What is SCIRP?

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

What is Open Access?

All original research papers published by SCIRP are made freely and permanently accessible online immediately upon publication. To be able to provide open access journals, SCIRP defrays operation costs from authors and subscription charges only for its printed version. Open access publishing allows an immediate, worldwide, barrier-free, open access to the full text of research papers, which is in the best interests of the scientific community.

- High visibility for maximum global exposure with open access publishing model
- Rigorous peer review of research papers
- Prompt faster publication with less cost
- Guaranteed targeted, multidisciplinary audience





Website: http://www.scirp.org Subscription: sub@scirp.org Advertisement: service@scirp.org