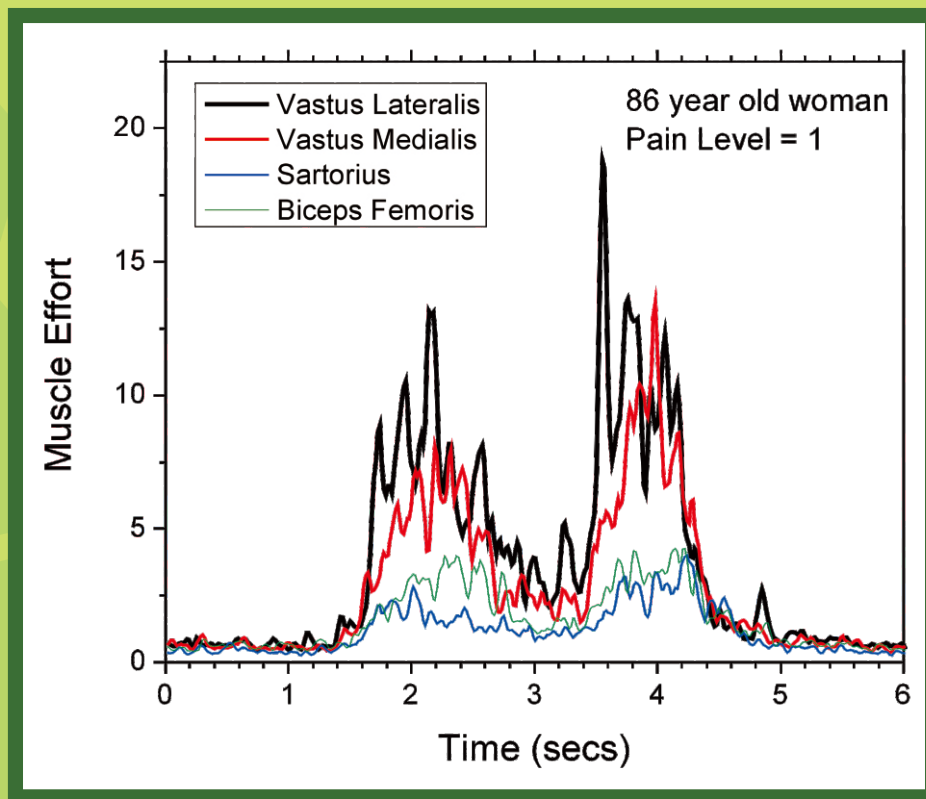


# JBiSE

ISSN: 1937-6871

Volume 5, Number 4, April 2012

Journal of **B**iomedical **S**cience and **E**ngineering



ISSN: 1937-6871



**Editor-in-Chief**  
**Kuo-Chen Chou**

# Journal Editorial Board

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

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

---

## Editor-in-Chief

**Prof. Kuo-Chen Chou**

Gordon Life Science Institute, San Diego, California, USA

## Editorial Board

**Prof. Suleyman I. Allakhverdiev**

Institute of Basic Biological Problems, Russia

**Prof. Christopher J. Branford-White**

London Metropolitan University, UK

**Prof. Thomas Casavant**

University of Iowa, USA

**Dr. Feng Cheng**

Yale University, USA

**Prof. Reba Goodman**

Columbia University, USA

**Prof. Fu-Chu He**

Chinese Academy of Sciences, China

**Prof. Robert L. Heinrikson**

Proteos, Inc., USA

**Prof. Zeng-Jian Hu**

Howard University, USA

**Prof. Takeshi Kikuchi**

Ritsumeikan University, Japan

**Prof. Rob Krams**

Imperial College London, UK

**Prof. Lukasz Kurgan**

University of Alberta, Canada

**Prof. Juan Liu**

Wuhan University, China

**Dr. Girdhar K. Pandey**

University of Delhi South Campus, India

**Dr. Ganesan Pugalenth**

Genome Institute of Singapore, Singapore

**Prof. Hong-Bin Shen**

Shanghai Jiao Tong University, China

**Dr. Yanmei Tie**

Harvard Medical School, USA

**Dr. Elif Derya Übeyli**

TOBB University of Economics and Technology, Turkey

**Dr. Ching-Sung Wang**

Oriental Institute Technology, Chinese Taipei

**Prof. Dong-Qing Wei**

Shanghai Jiao Tong University, China

**Dr. Murali Mohan Yallapu**

Sanford Research, USA

**Prof. Zhizhou Zhang**

Harbin Institute of Technology, China

## Managing Executive Editor

**Dr. Yufei Chen**

Scientific Research Publishing, USA Email: [yfchen@scirp.org](mailto:yfchen@scirp.org)

---

## Guest Reviewers

**Long Cheng**

**Gopal Krishan**

**Feng Li**

**Shenghua Ni**

**Harshavardhan Shakila**

**Mohammad Bagher Shamsollahi**

**Le Zhang**

## TABLE OF CONTENTS

### Volume 5, Number 4, April 2012

<b>A new hybrid particle swarm optimization for multimodal brain image registration</b>	
F. Ayatollahi, S. B. Shokouhi, A. Ayatollahi.....	153
<b>Automatic determination of MS lesion subtypes based on fractal analysis in brain MR images</b>	
M. Mohamadkhanloo, F. Mehrabi, A. Sohrabi.....	162
<b>Event-related potential investigation of different neural pathways for face and pattern perceptions in the human brain</b>	
R. Aoki, S. Okamoto, T. Sakimoto, K. Yoshida, H. Sasaki.....	170
<b>Computer-assisted formulas predicting cancer mortality risk after exposure to acute low dose ionizing radiation in humans</b>	
S. J. Chung.....	176
<b>A charge of the erythrocyte test by automated method</b>	
O. Gutsul, N. Shaplavsky, V. Buzhdygan, V. Slobodian.....	186
<b>Vibromyographic analysis of knee muscle imbalances in knee osteoarthritis</b>	
K. McLeod, S. Morley, A. Matsushima.....	190
<b>A coaxial-slot antenna for invasive microwave hyperthermia therapy</b>	
T. Jiao, H. Wang, Y. Zhang, X. Yu, H. J. Xue, H. Lv, X. J. Jing, H. Zhan, J. Q. Wang.....	198
<b>Studies on the optimal culture conditions of <i>Aureobasidium pullulans</i> to produce exopolysaccharides</b>	
J. L. Ma, G. B. Jiang, S. J. Yao, H. Jin, C. H. Wang.....	203
<b>Biodegradable stent</b>	
D. Y. Kwon, J. I. Kim, D. Y. Kim, H. J. Kang, B. Lee, K. W. Lee, M. S. Kim.....	208
<b>Status of tissue engineering and regenerative medicine in Iran and related advanced tools: Bioreactors and scaffolds</b>	
A. M. Gharravi, M. Orazizadeh, M. Hashemitabar, K. Ansari-Asl, S. Banoni, A. Alifard, S. Izadi.....	217

---

The figure on the front cover is from the article published in Journal of Biomedical Science and Engineering, 2012, Vol. 5, No. 4, pp. 190-197 by Kenneth McLeod, Sara Morley and Andrew Matsushima.

# **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](http://www.SciRP.org)) is published monthly by Scientific Research Publishing, Inc., USA.

#### **Subscription rates:**

Print: \$79 per issue.

To subscribe, please contact Journals Subscriptions Department, E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### **SERVICES**

#### **Advertisements**

Advertisement Sales Department, E-mail: [service@scirp.org](mailto:service@scirp.org)

#### **Reprints (minimum quantity 100 copies)**

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

E-mail: [sub@scirp.org](mailto:sub@scirp.org)

### **COPYRIGHT**

Copyright©2012 Scientific Research Publishing, Inc.

All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as described below, without the permission in writing of the Publisher.

Copying of articles is not permitted except for personal and internal use, to the extent permitted by national copyright law, or under the terms of a license issued by the national Reproduction Rights Organization.

Requests for permission for other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works or for resale, and other enquiries should be addressed to the Publisher.

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](mailto: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
- Genomics
- 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/CT/ECG Technologies and Electromagnetic Field Simulation
- NMR in Biomedicine
- Nonlinear Biomedical Physics
- Numerical Methods in Biomedical Engineering
- Pharmaceutical and Biomedical Analysis
- Physiological Signal Processing
- Proteomics
- Software, Tools and Application in Medical Engineering
- Structure-Based Drug Design

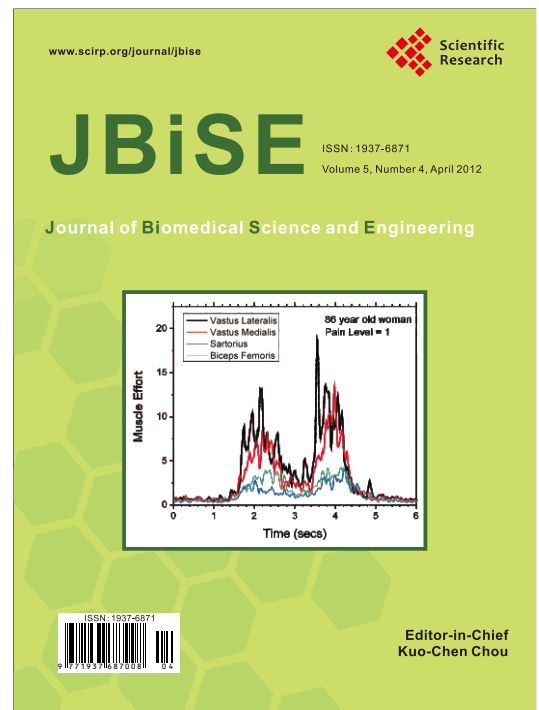
### Notes for Intending Authors

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](mailto:jbise@scirp.org)



### Editor-in-Chief

Prof. Kuo-Chen Chou

Gordon Life Science Institute, San Diego, California, USA

### Editorial Board

Prof. Suleyman I. Allakhverdiev	Institute of Basic Biological Problems, Russia
Prof. Christopher J. Branford-White	London Metropolitan University, UK
Prof. Thomas Casavant	University of Iowa, USA
Dr. Feng Cheng	Yale University, USA
Prof. Reba Goodman	Columbia University, USA
Prof. Fu-Chu He	Chinese Academy of Sciences, China
Prof. Robert L. Heinrikson	Proteos, Inc., USA
Prof. Zeng-Jian Hu	Howard University, USA
Prof. Takeshi Kikuchi	Ritsumeikan University, Japan
Prof. Rob Krams	Imperial College London, UK
Prof. Lukasz Kurgan	University of Alberta, Canada
Prof. Juan Liu	Wuhan University, China
Dr. Girdhar K. Pandey	University of Delhi South Campus, India
Dr. Ganesan Pugalethi	Genome Institute of Singapore, Singapore
Prof. Hong-Bin Shen	Shanghai Jiao Tong University, China
Dr. Yanmei Tie	Harvard Medical School, USA
Dr. Elif Derya Übeyli	TOBB University of Economics and Technology, Turkey
Dr. Ching-Sung Wang	Oriental Institute Technology, Chinese Taipei
Prof. Dong-Qing Wei	Shanghai Jiao Tong University, China
Dr. Murali Mohan Yallapu	Sanford Research, USA
Prof. Zhizhou Zhang	Harbin Institute of Technology, China

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