



Advances in Bioscience and Biotechnology



Journal Editorial Board

ISSN: 2156-8456 (Print) ISSN: 2156-8502 (Online)

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

Editor-in-Chief

Prof. Abass Alavi University of Pennsylvania, USA

Executive Editor-in-Chief

Prof. Roberto Fernández-Lafuente Consejo Superior de Investigaciones Científicas, Spain

Managing Executive Editor

Prof. Tingfeng LiTulane University, USA

Editorial Board

Prof. Suleyman I. Allakhverdiev Russian Academy of Sciences, Russia

Prof. Atsushi AsakuraUniversity of Minnesota, USADr. Sanchita Bandyopadhyay-GhoshUniversity of Toronto, CanadaProf. Susanta K. BehuraUniversity of Notre Dame, USAProf. Benoît ChénaisUniversité du Maine, FranceProf. Mohamed ChahineLaval University, Canada

Dr. Priya ChoudhryCalifornia Institute of Technology, USA

Prof. Alexsandro S. Galdino Universidade Federal de São João Del-Rei (UFSJ), Brazil

Prof. Mahdi Garelnabi University of Massachusetts, USA

Dr. Mazeyar Parvinzadeh Gashti Département de Chimie, Université Laval, Canada

Prof. Mehrnaz Gharaee-Kermani University of Michigan, USA

Prof. Jane L. Hoover-Plow Cleveland Clinic Lerner Research Institute, USA

Dr. Basalingappa L. HungundColumbia University, USAProf. Avinash P. IngleSGB Amravati University, India

Prof. Noah Isakov Ben Gurion University of the Negev, Israel

Dr. Sabzali A. Javadov University of Puerto Rico, USA

Dr. Shuli Kang University of Southern California, USA

Prof. Lukasz KedzierskiMonash University, AustraliaProf. Wan LeeDongguk University, South Korea

Dr. Lingyu LiStanford University, USADr. Jiyan MaOhio State University, USAProf. Manuela Martins-GreenUniversity of California, USA

Prof. James Michael Mathis Louisiana State University Health Sciences Center, USA

Prof. Subhash C. MojumdarUniversity of New Brunswick, CanadaProf. Pablo Iván NikelUniversity of San Martín, Argentina

Prof. Akbar NikkhahUniversity of Zanjan, IranProf. David PimentelCornell University, USAProf. Kun QuStanford University, USAProf. Alireza G. SenejaniYale University, USA

Dr. Manjunatha ShivarajuCentre for Regenerative Medicine, Harvard Stem Cell

Institute, Harvard Medical School, USA

Prof. Ajay Singh Lystek International Inc., Canada

Prof. Zheng Su Genentech Inc., USA

Prof. Jinrong WanUniversity of Missouri, USAProf. Jinfu WangZhejiang University, ChinaProf. Zhixiang WangUniversity of Alberta, CanadaDr. Yonggan WuStanford University, USAProf. Wanxi YangZhejiang University, China



ISSN Online: 2156-8502 ISSN Print: 2156-8456

Table of Contents

Advances in Bioscience and Biotechnology (ABB) Journal Information

SUBSCRIPTIONS

The *Advances in Bioscience and Biotechnology* (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 © 2017 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 © 2017 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: abb@scirp.org





Advances in Bioscience and Biotechnology

ISSN: 2156-8456 (Print) ISSN: 2156-8502 (Online)

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

Advances in Bioscience and Biotechnology (ABB) is an international journal dedicated to the latest advancement of biosciences. The goal of this journal is to provide a platform for scientists and academicians all over the world to promote, share, and discuss various new issues and developments in different areas of biosciences. 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 hard copy.

Editor-in-Chief Prof. Abass Alavi

University of Pennsylvania, USA

Executive Editor-in-Chief Prof. Roberto Fernández-Lafuente

Consejo Superior de Investigaciones Científicas, Spain

Managing Executive Editor

Prof. Tingfeng Li

Tulane University, USA

Editorial Board

Prof. Suleyman I. Allakhverdiev Prof. Atsushi Asakura Dr. Sanchita Bandyopadhyay-Ghosh Prof. Susanta K. Behura Prof. Benoît Chénais Prof. Mohamed Chahine Dr. Priya Choudhry Prof. Alexsandro S. Galdino Prof. Mahdi Garelnabi Dr. Mazeyar Parvinzadeh Gashti Prof. Mehrnaz Gharaee-Kermani Prof. Jane L. Hoover-Plow Dr. Basalingappa L. Hungund Prof. Avinash P. Ingle Prof. Noah Isakov Dr. Sabzali A. Javadov Dr. Shuli Kang Prof. Lukasz Kedzierski Prof. Wan Lee

Dr. Lingyu Li
Dr. Jiyan Ma
Prof. Manuela Martins-Green
Prof. James Michael Mathis
Prof. Subhash C. Mojumdar
Prof. Pablo Iván Nikel
Prof. Akbar Nikkhah
Prof. David Pimentel
Prof. Kun Qu
Prof. Alireza G. Senejani

Dr. Manjunatha Shivaraju Prof. Ajay Singh Prof. Zheng Su Prof. Jinrong Wan Prof. Jinfu Wang Prof. Zhixiang Wang Dr. Yonggan Wu Prof. Wanxi Yang

Subject Coverage

This journal invites original research and review papers that address the following issues in bioscience and biotechnology. Topics of interest include, but are not limited to:

- Aerobiology
- Anthropology
- Biochemical Genetics
- Biochemistry
- Bioinformatics
- Biological Engineering
- Biological Evolution
- Biomathematics
- Biophysics
- Biostatistics

- Botany
- Cytobiology
- Developmental Biology
- Ecology
- Entomology
- Enzyme Engineering
- Genetic Engineering
- Genetics
- Immunology
- Microbiology

- Molecular Biology
- Nano-Bio-Analysis
- Neurobiology
- Pathology
- Physiology
- Protein Engineering
- Radiation Biology
- Virology
- Zoology

We are also interested in short papers (letters) that clearly address a specific problem, and short survey or position papers that sketch the results or problems on a specific topic. Authors of selected short papers would be invited to write a regular paper on the same topic for future issues of the *ABB*.

Notes for Intending Authors

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Paper submission will be handle electronically through the website. All papers are refereed through a peer review process. Authors are responsible for having their papers checked for style and grammar prior to submission to ABB. For more details about the submissions, please access the website.

Website and E-Mail

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

E-mail: abb@scirp.org