

ISSN: 2160-5866

Volume 12, Number 12, December 2022



# Journal of Behavioral and Brain Science



ISSN: 2160-5866



<https://www.scirp.org/journal/jbbs>

# Journal Editorial Board

ISSN Print: 2160-5866 ISSN Online: 2160-5874

<https://www.scirp.org/journal/jbbs>

---

## Editor-in-Chief

**Prof. Sergey Konstantinovich Sudakov** P.K. Anokhin Research Institute of Normal Physiology, Russia

## Editorial Board

<b>Prof. Manar AlAzzam</b>	Al al-Bayt University, Jordan
<b>Prof. Gjumrakch Aliev</b>	University of Atlanta, USA
<b>Dr. Khalid Wesel Al-Quliti</b>	College of Medicine, Taibah University, Saudi Arabia
<b>Dr. Abdoulaye BÂ</b>	Université Félix Houphouët-Boigny, Cote d'Ivoire
<b>Dr. Raymond Chuen-Chung Chang</b>	University of Hong Kong, China
<b>Dr. Alexandre Croquelois</b>	University of Lausanne, Switzerland
<b>Dr. Manoj P. Dandekar</b>	The University of Texas Health Science Center at Houston, USA
<b>Dr. Valentina Echeverria</b>	Bay Pines Veterans Affairs Healthcare System, USA
<b>Dr. Cheng-Xin Gong</b>	New York State Institute for Basic Research in Developmental Disabilities, USA
<b>Dr. Giuseppe Iurato</b>	Linnaeus University, Vaxjo, Sweden
<b>Dr. Chella Kamarajan</b>	SUNY Downstate Medical Center, USA
<b>Dr. Anna Maria Lavezzi</b>	"Lino Rossi" Research Center, Italy
<b>Prof. Xu Lei</b>	Southwest University, China
<b>Dr. James J. Levitt</b>	Brockton VA Medical Center, USA
<b>Dr. Panchanan Maiti</b>	Central Michigan University, USA
<b>Prof. Viktor A. Minkin</b>	Elsys Corp, Russia
<b>Dr. Mindy J. D. Miserendino</b>	Sacred Heart University, USA
<b>Prof. Esther Perez-Torrero</b>	Engineering School, Autonomous University of Querétaro, Mexico
<b>Dr. Arcady Putilov</b>	Research Institute for Molecular Biology and Biophysics, Russia
<b>Prof. Djemli Samir</b>	Badji Mokhtar University, Algeria
<b>Prof. Pertsov Sergey Sergeevich</b>	P.K. Anokhin Institute of Normal Physiology, Russia
<b>Dr. Mohammad Shahnawaz</b>	University of Texas Health Science Center at Houston, USA
<b>Prof. Karam F. A. Soliman</b>	Florida A&M University, USA
<b>Prof. Makio Takeda</b>	Kobe University, Japan
<b>Dr. Gabriel Salazar Tortolero</b>	International University of Catalonia, Barcelona, Spain
<b>Dr. M. Afzal Upal</b>	Defence Research & Development, Canada
<b>Prof. Gang Yang</b>	Zhuji Affiliated Hospital of Shaoxing University, China
<b>Prof. Xin-Fu Zhou</b>	University of South Australia, Australia
<b>Prof. Phillip R. Zoladz</b>	School of Health and Behavioral Sciences, Ohio Northern University, USA

# Table of Contents

**Volume 12    Number 12**

**December 2022**

**PGE2 as a Morphine-Seeking Behavior Modulator in the Place Preference Model**

A. Jiménez-González, A. Ochoa-Aguilar, K. Mendoza-Negrete, L. Parra-Gamez, C. Gómez-Acevedo ..... 627

**Melatonin Enhances Object Recognition Memory through Melatonin MT1 and MT2 Receptor-Mediated and Non-Receptor-Mediated Mechanisms in Male Mice**

M. Sano, H. Iwashita, A. Hattori, A. Chiba ..... 640

**The Role of Baseline Functional MRI as a Predictor of Post-Stroke Rehabilitation Efficacy in Patients with Moderate to Severe Upper Extremity Dysfunction**

R. A. Ghaleh, S. Rahimibarghani, N. Shirzad, A. Ahangari, M.-R. Nazem-Zadeh,  
A. M. A. Abadi, A. Tafakhori, H. R. Fateh..... 658

**The Evolutionary Development of Jungian Advanced Motor Processing® (JAMP®)**

L. Al-Samarrai, Y. Al-Sammarraie, E. Tomlinson ..... 670

# Journal of Behavioral and Brain Science (JBBS)

## Journal Information

### SUBSCRIPTIONS

The *Journal of Behavioral and Brain Science* (Online at Scientific Research Publishing, <https://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 and reuse rights for the front matter of the journal:**

Copyright © 2022 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 © 2022 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**

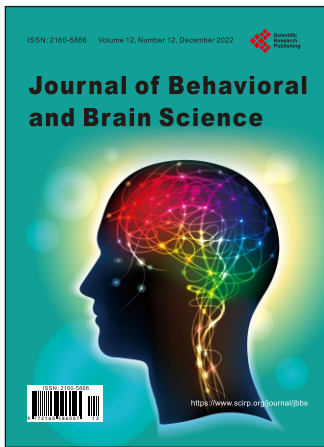
Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any 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: [jbbs@scirp.org](mailto:jbbs@scirp.org)

# Call for Papers



## Journal of Behavioral and Brain Science

ISSN: 2160-5866 (Print) ISSN: 2160-5874 (Online)

<https://www.scirp.org/journal/jbbs>

Journal of Behavioral and Brain Science (JBBS) is an international journal dedicated to the latest advancement of behavioural and brain function. Articles dealing with the neuroanatomical and neurochemical basis of behavior are especially welcomed. Multidisciplinary contributions from all fields of the neurosciences are encouraged so long as emphasis is placed in investigating the biological substrates of behavior and of mental processes underlying behavior.

### Editor-in-Chief

Prof. Sergey Konstantinovich Sudakov

P.K. Anokhin Research Institute of Normal  
Physiology, Russia

### Editorial Board

Prof. Manar Alazzam  
Prof. Gjumrakch Aliev  
Dr. Khalid Wesel Al-Quliti  
Dr. Abdoulaye BÂ  
Dr. Raymond Chuen-Chung Chang  
Dr. Alexandre Croquelois  
Dr. Manoj P. Dandekar  
Dr. Valentina Echeverria  
Dr. Cheng-Xin Gong  
Dr. Giuseppe Iurato

Dr. Chella Kamarajan  
Dr. Anna Maria Lavezzi  
Prof. Xu Lei  
Dr. James J. Levitt  
Dr. Panchanan Maiti  
Prof. Viktor A. Minkin  
Dr. Mindy J. D. Miserendino  
Prof. Esther Perez-Torrero  
Dr. Arcady Putilov  
Prof. Djemli Samir

Prof. Pertsov Sergey Sergeevich  
Dr. Mohammad Shahnawaz  
Prof. Karam F. A. Soliman  
Prof. Makio Takeda  
Dr. Gabriel Salazar Tortolero  
Dr. M. Afzal Upal  
Prof. Gang Yang  
Prof. Xin-Fu Zhou  
Prof. Phillip R. Zoladz

### Subject Coverage

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

- Behavioural Science
- Cognitive Neuroscience
- Neurobiology
- Neuroimaging
- Neurology
- Neuropharmacology and Psychopharmacology
- Neurosurgery
- Neurotoxicology
- Psychiatry

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 *JBBS*.

### 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. Authors are responsible for having their papers checked for style and grammar prior to submission to JBBS. For more details about the submissions, please access the website.

### Website and E-Mail

<https://www.scirp.org/journal/jbbs>

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