Amsterdam, The Netherlands and San Antonio, TX, USA, November 12, 2010 – There is growing global concern regarding the potential neurotoxicity of anesthetics. Biophysical and animal model studies have identified molecular changes simulating Alzheimer’s disease (AD) pathology after exposure to inhaled anesthetics. This research has alerted anesthesiologists, neuropsychologists, surgeons and other clinicians to initiate in-depth clinical research on the role of anesthetics in post operative cognitive decline.

AD is a devastating disease commonly found in elderly persons and an enormous world health problem. It is manifested by severe memory loss, language problems, impaired decision making and affected activities of daily living. The human population is aging with increase in life expectancy. Therefore, we are confronted with increases in the number of persons at risk of developing AD and also the number of elderly undergoing surgical procedures. Any possible association between the two therefore merits careful consideration.
In the absence of either a single coherent etiological model to explain the cause of AD or an effective treatment, a consistent part of funding for research in AD is currently aimed at identifying risk factors as well as delaying the clinical manifestations of the disease. Recent research has focused on reduction of disease incidence through identification of risk factors. In this context the question of the association between AD and anesthesia has again been raised.

A supplement to the *Journal of Alzheimer’s Disease* on “Anesthetics and Alzheimer’s Disease” provides the platform to bring the latest scientific studies to the AD research and clinical communities. Leading scientist and guest Editors Dr. Pravat K Mandal from the National Brain Research Centre, a world class neuroscience centre located in India, and Dr. Vincenzo Fodale from the University of Messina, Italy, a university recognized globally for advanced research, have brought together the latest research results from scientists, neurologists, physicians, neuropsychologists, and anesthesiologists on various aspects of the pathophysiology of AD and the role of anesthetics as a possible risk factor.

**Highlights of special issue are:**

- Cellular and molecular pathology in AD
- Influence of anesthetic size on Aβ oligomerization established using state-of-the-art NMR spectroscopic technique (*a fundamental contribution in this area of research*)
- Evidence from animal model studies indicating more plaque formation in transgenic mice treated with inhaled anesthetics like halothane or isoflurane
- Association between impairment of cholinergic neurons and cognitive deficits in AD patients; and the possible role of anesthetics in cholinergic dysfunction
- Multifactorial etiology, including the type of anesthesia, apolipoprotein E genotype, and the presence of co-morbid disorders, in the development of long-term post-operative cognitive decline
- Anesthesia in patients with dementia; noteworthy clinical antecedents and peri-operative risk management in AD

Guest Editors Drs. Mandal and Fodale emphasized that “this special issue is a cornerstone in the effort to update and clarify the possible linkages between common anesthetics given to millions of patients every day and the pathomechanism of AD, thus contributing to an ongoing constructive debate. The Editors of the supplement do not intend to engender a ‘fear of anesthesia’ that could lead to irrational rejection of surgery in later life, but they hope to encourage the earnest quest for the ‘safe anesthetic’ for the elderly and more research are warranted.”

Dr. Mandal stated that “the publication of this issue is most timely and it will add value, depth, and advancement to the current scientific knowledge in this area.”

## ##

**NOTES FOR EDITORS**

**JAD Supplement: Anesthetics and Alzheimer’s Disease**

**Guest Editors**
Dr. Pravat K. Mandal, PhD  
Additional Professor (Scientist V)  
National Brain Research Centre, India
Email: Pravat.mandal@gmail.com

Dr. Vincenzo Fodale, MD
Aggregate Professor
University of Messina, Italy
Email: vfodale@unime.it

Table of Contents

Vincenzo Fodale, Karen Ritchie, Lars S. Rasmussen, Pravat K. Mandal
Anesthetics and Alzheimer’s Disease: Research and Background

Verena H. Finder
Alzheimer’s Disease: A General Introduction and Pathomechanism

Barbara Eckel, Manfred Blobner, Gerhard Rammes
Anesthetics Promoting in vitro AβPP Metabolism and Amyloid-β Toxicity

Pravat K. Mandal, Manisha Ahuja
Comprehensive Nuclear Magnetic Resonance Studies on Interactions of Amyloid-β with Different Molecular Sized Anesthetics

Daniela Schifilliti, Letterio B. Santamaria, Giovanni Rosa, Gianfranco Di Nino, Pravat K. Mandal, Vincenzo Fodale
Cholinergic Central System, Alzheimer’s Disease, and Anesthetics Liaison: a Vicious Circle?

María Ángeles Mena, Juan Perucho, Isabel Rubio, Justo García de Yébenes
Studies in Animal Models of the Effects of Anesthetics on Behavior, Biochemistry, and Neuronal Cell Death

Xiaoqin Run, Zhihou Liang, Cheng-Xin Gong
Anesthetics and Tau Protein: Animal Model Studies

Manjari Tripathi, Deepti Vibha
Unusual Risk Factors for Cognitive Decline

Sam Ewan Mason, Anna Noel-Storr, Craig William Ritchie

Federico Bilotta, Andrea Doronzio, Elisabetta Stazi, Luca Titi, Vincenzo Fodale, Gianfranco Di Nino, Giovanni Rosa
Postoperative Cognitive Dysfunction: Toward the Alzheimer’s Disease Pathomechanism Hypothesis

Tara Vanderweyde, Martin M. Bednar, Stuart A. Forman, Benjamin Wolozin
Iatrogenic Risk Factors for Alzheimer’s Disease: Surgery and Anesthesia

Marie-Laure Ancelin, Guilhem de Roquefeuil, Jacqueline Scali, François Bonnel, Jean-François Adam, Jean-Claude Cheminal, Jean-Paul Cristol, Anne-Marie Dupuy, Isabelle Carrière, Karen Ritchie
Long-Term Post-Operative Cognitive Decline in the Elderly: The Effects of Anesthesia Type, Apolipoprotein E Genotype, and Clinical Antecedents
Yatin Mehta and Raveen Singh
**Cognitive Dysfunction after Cardiac Surgery**

Gianfranco Di Nino, Marco Adversi, Boaz G. Samolsky Dekel, Vincenzo Fodale, Giovanni Rosa, Rita M. Melotti
**Peri-Operative Risk Management in Patients with Alzheimer’s Disease**

Kamilia S. Funder, Jacob Steinmetz and Lars S. Rasmussen
**Anesthesia for the Patient with Dementia**

**ABOUT THE JOURNAL OF ALZHEIMER’S DISEASE (JAD)**
The *Journal of Alzheimer's Disease* ([http://www.j-alz.com](http://www.j-alz.com)) is an international multidisciplinary journal to facilitate progress in understanding the etiology, pathogenesis, epidemiology, genetics, behavior, treatment and psychology of Alzheimer's disease. The journal publishes research reports, reviews, short communications, book reviews, and letters-to-the-editor. Groundbreaking research that has appeared in the journal includes novel therapeutic targets, mechanisms of disease and clinical trial outcomes. The *Journal of Alzheimer's Disease* has an Impact Factor of 3.82 according to Thomson Reuters' 2010 edition of *Journal Citation Reports*. It is ranked #19 on the Index Copernicus Top 100 Journal List. The Journal is published by IOS Press ([http://www.iospress.nl](http://www.iospress.nl)).

The Journal is led by two internationally acknowledged experts in the field.

Editor-in-Chief George Perry, PhD, Professor of Biology, Dean of College of Sciences, University of Texas at San Antonio, is distinguished as one of the top Alzheimer's disease researchers ([http://iospress.metapress.com/content/v932x18k23300844/fulltext.pdf](http://iospress.metapress.com/content/v932x18k23300844/fulltext.pdf)) with over 800 publications and one of the top 100 most-cited scientists in Neuroscience & Behavior. He served as President of the American Association of Neuropathologists.

Editor-in-Chief Mark A. Smith, Ph.D., Professor of Pathology, Case Western Reserve University, is recognized as one of the world's top 100 Alzheimer's disease investigators according to a recent study published in the March 2009 issue of the *Journal of Alzheimer's Disease* ([http://iospress.metapress.com/content/v932x18k23300844/fulltext.pdf](http://iospress.metapress.com/content/v932x18k23300844/fulltext.pdf)). He also serves as Executive Director of the American Aging Association.

**ABOUT IOS PRESS**
Commencing its publishing activities in 1987, IOS Press ([www.iospress.nl](http://www.iospress.nl)) serves the information needs of scientific and medical communities worldwide. IOS Press now (co-)publishes over 100 international journals and about 130 book titles each year on subjects ranging from computer sciences and mathematics to medicine and the natural sciences.

IOS Press continues its rapid growth, embracing new technologies for the timely dissemination of information. All journals are available electronically and an e-book platform was launched in 2005.

Headquartered in Amsterdam with satellite offices in the USA, Germany, India and China, IOS Press has established several strategic co-publishing initiatives. Notable acquisitions included Delft University Press in 2005 and Millpress Science Publishers in 2008.