Editor

Vladimir Marascu-Klein

Advances in Biomedicine & Health Science

Advances in Biomedicine & Health Science

Proceedings of the 2nd International Conference on Biomedicine and Health Engineering (BIHE '13)

Proceedings of the 2nd International Conference on Health Science and Biomedical Systems (HSBS '13)

Brasov, Romania, June 1-3, 2013

Scientific Sponsors

ADVANCES in BIOMEDICINE and HEALTH SCIENCE

Proceedings of the 2nd International Conference on Biomedicine and Health Engineering (BIHE '13)
Proceedings of the 2nd International Conference on Health Science and Biomedical Systems (HSBS '13)

Brasov, Romania
June 1-3, 2013

Scientific Sponsors:

Transilvania University of Brasov

University of Craiova

University Politehnica of Bucharest

Stefan cel Mare Universtity of Suceava

Constantin Brancusi University of Targu-Jiu

Megatrend University of Belgrade

University Lucian Blaga of Sibiu

Constanta Maritime University

Recent Advances in Biology and Biomedicine Series | 2

ISSN: 1790-5125
ISBN: 978-1-61804-190-6

ADVANCES in BIOMEDICINE and HEALTH SCIENCE

Proceedings of the 2nd International Conference on Biomedicine and Health Engineering (BIHE '13)

Proceedings of the 2nd International Conference on Health Science and Biomedical Systems (HSBS '13)

Brasov, Romania
June 1-3, 2013

Published by WSEAS Press
www.wseas.org

All papers of the present volume were peer reviewed by no less that two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: http://www.worldses.org/review/index.html

ISSN: 1790-5125
ISBN: 978-1-61804-190-6

ADVANCES in BIOMEDICINE and HEALTH SCIENCE

Proceedings of the 2nd International Conference on Biomedicine and Health Engineering (BIHE '13)

Proceedings of the 2nd International Conference on Health Science and Biomedical Systems (HSBS '13)

Brasov, Romania
June 1-3, 2013

Table of Contents

ISBN: 978-1-61804-190-6

ISBN: 978-1-61804-190-6

Plenary Lecture 1

Application of Induced Pluripotent Stem Cells to Neuronal Differentiation and Nerve Tissue Regeneration in Biomaterials

Professor Yung-Chih Kuo
Department of Chemical Engineering
National Chung Cheng University
Republic of China
E-mail: chmyck@ccu.edu.tw

Abstract: The understanding of differentiating induced pluripotent stem (iPS) cells in biomaterials is an important issue in recent biotechnological development. The cultivation and differentiation of iPS cells in porous scaffolds is presented in this speech. The culture results in various hybrid biomaterials, including alginate-poly(γ-glutamic acid) with surface CSRARKQAASIKVAVSADR, TATVHL peptide-grafted alginate-poly(?-glutamic acid), poly(ε-caprolactone)-poly(β-hydroxybutyrate), heparinized poly(ε-caprolactone)-poly(β-hydroxybutyrate), alginate-poly(γ-glutamic acid), alginate-chitosan-gelatin with surface neuron growth factor, and chitin-chitosan-gelatin, will be presented. Physicochemical property and morphology of these scaffolding substrates, adhesion of iPS cells, cytotoxicity, flow cytometric diagram, and fluorescent image of construct staining against stage-specific embryonic surface antigen-1 and βIII tubulin will also be discussed. The combination of iPS cells with porous biomedical scaffolds can be effective in inducing the neuronal differentiation and can enhance nerve regeneration for clinical trial.

Brief Biography of the Speaker: Dr. Yung-Chih Kuo is a professor at the Department of Chemical Engineering, National Chung Cheng University. His research interests are focused on biomaterials, drug delivery system, tissue engineering, blood-brain barrier, stem cell differentiation, nerve regeneration, cancer therapy, Alzheimer's disease treatment, biophysics, and colloid and interface science. In these fields, he has authored or coauthored over 100 SCI journal papers. He is an honor member of Phi Tau Phi Society, a life member in various academic Societies including American Nano Society, European Atherosclerosis Society, Asia-Pacific Chemical, Biological and Environmental Engineering Society, Asian Federation of Biotechnology, Asian Biotechnology Directory, Taiwanese Society of Biomedical Engineering, Chinese Institute of Engineers, Taiwan Institute of Chemical Engineers, Biochemical Engineering Society of Taiwan, and Taiwan Biomaterials and Controlled Release Society. He won Young Scholar Award in 2003 and Excellent Research Award in 2010. He is also an associate editor of J. Taiwan Inst. Chem. Engrs. (Impact factor 2.110) and an editorial board member in 6 journals, and has been invited as a manuscript reviewer for over 50 journals (top reviewer of the Journal of Physical Chemistry (American Chemical Society)), an external reviewer for academic awards, research grants, faculty recruitments and promotions, and financial support of hosting international symposiums, and an advisory board committeeman of international conferences and symposiums.

ISBN: 978-1-61804-190-6

Plenary Lecture 2

Some Automatic Control Methods of Brain Temperature with Its Local Estimation for Clinical Hypothermia

Professor Hidetoshi Wakamatsu
Dept. Biomedical System Technology
Graduate School of Health Sciences
Tokyo Medical and Dental University
Japan
E-mail: wakamatsu.bse@tmd.ac.jp

Abstract: Automatic control systems of brain hypothermia treatment of patients in cerebrovascular disorders are discussed for water/air body surface cooling, direct cooling of blood and catheter in a blood vessel, and selective brain cooling including the estimation of temperature of specific brain part in order to prevent secondary brain damage and avoid various side effects. A patient in ICU is regarded as a unity controlled system with inputs such as temperature of water/air into blanket, blood and cathether in a blood vessel and infusing Ringer's solution into jugular vein in realization of an appropriate temperature of specific brain part. Thus, brain temperature is well controlled in a long period according to the schedule by physicians and the state of patients with little influence due to various medical treatments during the therapeutic course under continuously internal and external change of environment including the effect of characteristics of individual patients. The effective algorithm of optimal-adaptive and fuzzy control laws inclusive of our clinically developed cooling and warming machines are discussed for therapeutic course to keep temperature of specific brain part of a patient within its appropriate range. The same concept is applied to the other cases of brain temperature control, where the estimation of intracerebral temperature distribution is basically studied. Hereby, a mathematical continuum model is applied, which reflects metabolic heat production and Fourier's heat conduction in a brain with necessary parameters obtained from various clinical models, while an intracerebral temperature distribution is clinically difficult to observe. That enables us to perform an experiment of heat conduction in a similar condition of human for the study of future brain hypothermia.
The concerning present method is not only for the control of biologically special mechanisms, but also for practically automatic long time control of state and function by approach of medicare using medicine and/or by surgery as structural changes, because conventional methods are sometimes not effective due to biological characteristics depending on individualities.

Brief Biography of the Speaker: Born on 15.Nov.1946, received his B.E. and M.E. degrees from Yokohama National University in 1970 and 1972, respectively. He received his Dr. of Eng. degree in 1984 from the University of Tokyo. He was a research Associate at the Institute for Medical and Dental Engineering from 1972-1986. Visiting Research Associate, Institute for Biocybernetics, University of Erlangen-Nuernberg, Germany 1973-1974. Associate Professor at Ashikaga Institute of Technology 1986-1988, Associate professor 1988-1991, Professor 1991-1992 at Fukui University and Professor, Faculty of Medicine, Professor, Graduate School of Health Care Sciences in 1992-2012, Professor Emeritus, Tokyo Medical and Dental University since 2012. In 1994 a visiting professor, Oregon State University and so on. From 2006 a general chair of Asia Pacific Conference on Control and Measurement. From 2010 Editor-in-chief, Journal of Automatic Control of Physiological State and Function (ACPSF).

ISBN: 978-1-61804-190-6

Plenary Lecture 3

Arterial Stiffness - Current Issues

Associate Professor Ioana Mozos
Department of Functional Sciences - Pathophysiology
"Victor Babes" University of Medicine and Pharmacy
Timisoara, Romania
E-mail: ioanamozos@umft.ro

Abstract: Arterial stiffness is a marker of vascular dysfunction, organ damage, subclinical atherosclerosis and cardiovascular risk. It is significantly associated with cardiovascular risk and mortality, aging and several diseases.
The session includes a description of the main factors and mechanisms associated with arterial stiffening in aging patients, hypertension, chronic kidney disease, diabetes mellitus and systemic autoimmune diseases.
The pulse wave velocity and augmentation index were identified as valuable, reliable, simple and inexpensive markers for arterial stiffness, suitable for clinical and epidemiological studies. Arterial stiffness can be assessed using several devices: oscillometric, tonometric or plethysmographic and can be measured at the systemic, regional or local level.
The most important adverse effect of arterial stiffening is an elevated left ventricular afterload, with left ventricular hypertrophy and impaired coronary perfusion.

Brief Biography of the Speaker: Dr I. Mozos graduated 1992 the "Victor Babes" University of Medicine and Pharmacy from Timisoara, Romania and holds a PhD from the same University. Since 1998, she served at the Pathophysiology Department as Assistant professor, Lecturer and, lately, as Associate Professor. Her research interests include: ventricular arrhythmia risk, QT interval, late ventricular potentials, body surface mapping, myocardial infarction, atherosclerosis, and hypertension. She published 31 full-text articles (6 in ISI journals), 61 ISI abstracts, 16 book-chapters, 4 books and has 11 itations.

ISBN: 978-1-61804-190-6

Authors Index

ISBN: 978-1-61804-190-6