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Carlos M. Travieso-Gonzalez



Recent Advances on Biomedical Sciences

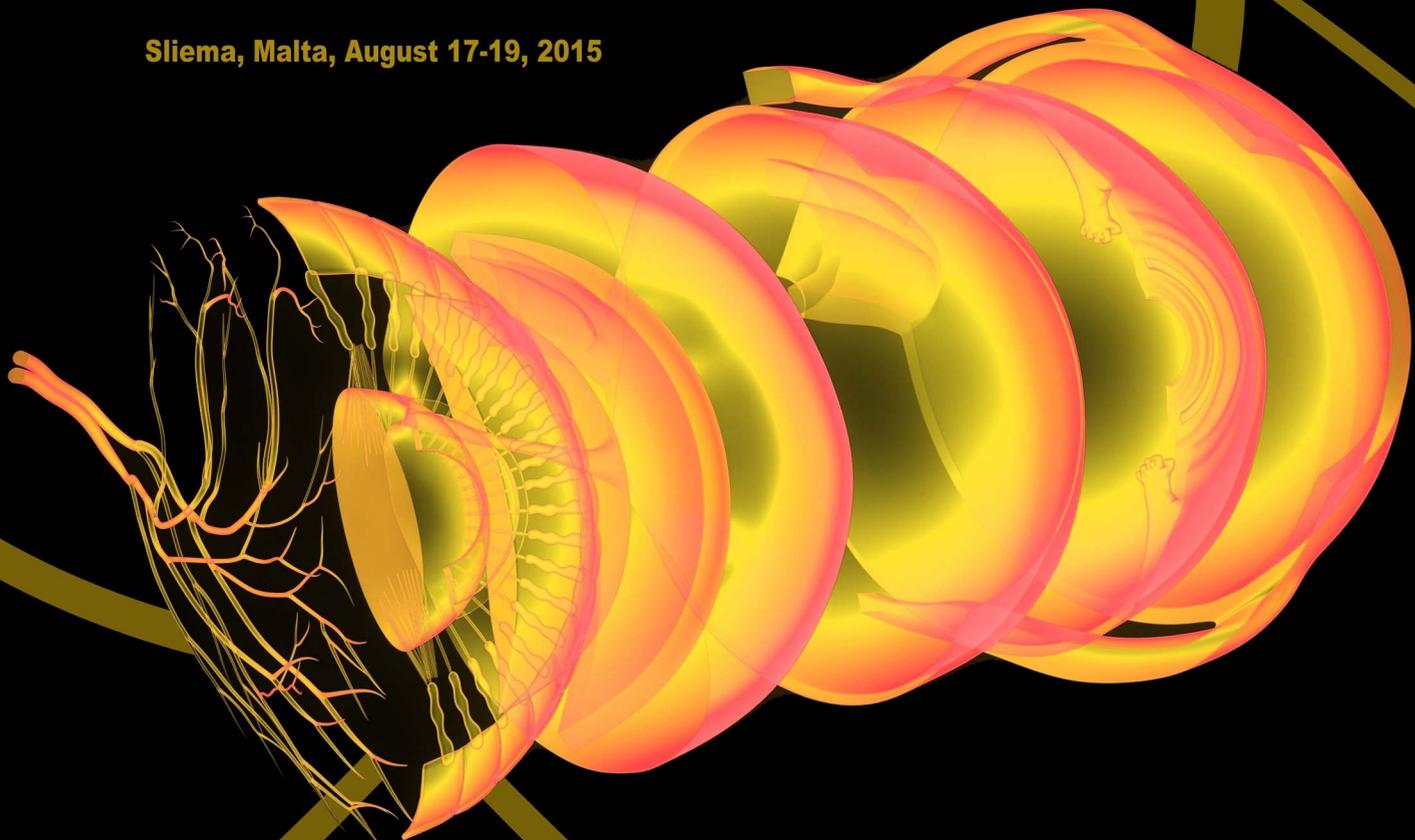
 **Proceedings of the 11th International Conference on Cellular and Molecular Biology, Biophysics and Bioengineering (BIO '15)**

Seoul, South Korea, September 5-7, 2015

 **Proceedings of the 4th International Conference on Health Science and Biomedical Systems (HSBS '15)**

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Table of Contents

Plenary Lecture 1: Control Functions and Bipolar Potentials in Excitatory Cells - Characteristics of Neuron and Unicellular Organism	9
<i>Atsushi Fukasawa</i>	
Plenary Lecture 2: The Usage of Liver Extract Versus Growth Factors in the Differentiation of Mesenchymal Stem Cells into Hepatocyte Like Cells	10
<i>Shaden Muawia Hanafy</i>	
Phase Space Reconstruction of Optogenetic Data	11
<i>Sorinel A. Oprisan, Tamas Tompa, Patrick E. Lynn, Antonieta Lavin</i>	
Activity of a Neuron for Characteristic Potential Waveforms of Pulse and Plateau with Positive and Negative Polarities	20
<i>Yumi Takizawa, Atsushi Fukasawa, Kazuhiko Natori</i>	
Fully Automatic Segmentation and Detection of Pulmonary Artery and Embolism in CTA Images	28
<i>Jamshid Dehmeshki, Y. Ebrahimdoost, S. D. Qanadli</i>	
Laryngograph as a Tool in Diagnosis and Therapy of Voice Disorders	34
<i>Jolanta Zielińska, Ewa Brzdek</i>	
A Computational Study of a Prebiotic Synthesis of L-Tyrosine	39
<i>Nigel Aylward</i>	
Statistical Methods in Healthcare Management: Case Study of Slovenian Clinic	47
<i>Nadja Damij, Franc Jelenc, Jana Suklan</i>	
Positive and Negative Action Potentials in Paramecium Relating to Neurons	54
<i>Yumi Takizawa, Atsushi Fukasawa, Hiro-aki Takeuchi</i>	
Oxidative Stress in Diabetes: Ammonia Breath Analysis by Laser Photoacoustic Spectroscopy	61
<i>Mioara Petrus, Ana-Maria Breatu, Cristina Popa</i>	
Activity of a Neuron for Generation of Pulse and Plateau with Positive and Negative Potentials	65
<i>Atsushi Fukasawa, Yumi Takizawa</i>	
Biomedical Applications of CO₂ Laser Photoacoustic Spectroscopy	72
<i>Cristina Popa, Mioara Petrus, Ana M. Bratu</i>	
A Computational Study of a Prebiotic Synthesis of L-Valine	75
<i>Nigel Aylward</i>	
Do Excel and iGrafx Provide the Same Healthcare Process Simulation Results?	81
<i>Nadja Damij, Franc Jelenc, Biljana Mileva Boshkoska</i>	

Investigation of Mechanical Properties of a Biocompatible Film from Riboflavin and Gelatin	88
<i>Bariş Demirbay, Gülşen Akin Evingür, Fatma Gülay Acar</i>	
The Viscosity Behavior of Biocompatible Solutions Including Riboflavin and Gelatin	91
<i>Bariş Demirbay, Fatma Gülay Acar</i>	
DaVinci System, a Partner or just a Tool?	95
<i>Săvulescu Florin, Cîrlan Cristian</i>	
Activity of Bipolar Potential Generation in Paramecium	98
<i>Yumi Takizawa, Atsushi Fukasawa, Hiro-aki Takeuchi</i>	
Preparation of Chitosan Magnetic Nanoparticles Loaded Recombinant Tissue Plasminogen Activator for Targeted Thrombolysis	105
<i>Jyh-Ping Chen, Hao-Lung Hsu</i>	
HLA-C Gene in Hepatitis C Virus Infected Patients in Egypt, to Estimate the Relation Between HLA-C Gene and Interferon / Ribavirin as Treatment for Hepatitis C Virus	112
<i>Shaden Muawia Hanafy, Amal Ahmed Abbas, Safy Kabeel Aly Mansour</i>	
Measurement of Intra-Abdominal Fat Thickness Using Ultrasound for Visceral Fat Estimation	118
<i>Robby Hermawan, Irma H. Hikmat, Ristaniah D. Soetikno, Eko Supriyanto, Saravana Kumar Jaganathan</i>	
Binaural Beat Entrainment Effect on Prefrontal and Parietal Brain EEG in Theta Frequency	124
<i>Muhammad Wildan Gifari, Sheikh Mohamad Said, Jostinah Lam, Noraini Jalil, Eko Supriyanto</i>	
Evaluation of Cardiac Markers Using Radar Chart	130
<i>Tay Yii Cheng, Mochrosin, Muhammad Haikal Satria, Eko Supriyanto, Jasmy Yunus</i>	
Nonlinear Patterns During the Temporal Organization of Self-Initiated Movement	137
<i>Juliana Dushanova</i>	
Reduction Mercury-Polluted Water in Gold Mine with Anaerobic Bacteria	142
<i>Prima Endang Susilowati, Sapto Raharjo, Rachmawati Rusdin, Misrawati, Siti Nur Hajiran, Sarfina, Muzuni</i>	
Fabrication of Porcine DNA Biosensor Based on [Ru(bpy)₂PIP]₂⁺ Complex	147
<i>Nurul Izni Abdullah Halid, Haslina Ahmad, Lee Yook Heng, Nurul Huda Abd. Karim, Siti Norain Harun, Siti Aishah Hasbullah</i>	
Biological Activity of Minimal Dose of Aerosolized Interferon-α in Male Albino Rats	150
<i>Khalil A. El-Halfawy, Shaden M. Hanafy, Bahgat A. El-Fiky, Hassan M. Hassan</i>	
Authors Index	157

Plenary Lecture 1

Control Functions and Bipolar Potentials in Excitatory Cells – Characteristics of Neuron and Unicellular Organism



Professor Atsushi Fukasawa
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Abstract: Secretary, muscle, and neural cells in multicellular organism induce excitations for stimulations. Upon reception of external or internal stimulation, potential pulses are induced in excitatory cells when reception potential exceeds threshold. Unicellular organisms are the other type of excitatory cells.

He will present first how unicellular organisms control cilia of paramecium and tentacles of noctiluca. Forward or backward movements by cilia of paramecium, and expansion or contraction of food gathering tentacles of noctiluca are controlled by positive and negative potentials generated in a single cell.

Recently not only positive potential (pulse and plateau) but also negative potential plateau are reported in studies in neural systems. Common basis of activity in neurons will be presented on dual configuration with Na^+ and Cl^- as the dominant charges (ions) for bipolar action potentials.

Brief Biography of the Speaker: Atsushi Fukasawa received the Master of Arts degree and Ph.D. degree from Waseda University in 1967 and 1983. He was a professor in Graduate School of Natural Science, Chiba University in 1997. He received the Award of the Agency of Science and Technology, Japan in 1982, and Ohm (publisher) Prize in 1994. He received Telecommunication System Technology Prize from the Foundation of Telecommunication Association, Japan in 2004. He is a senior member of the IEEE.

Dr. A. Fukasawa and his colleague, Dr. Y. Takizawa are the recipients of the Best Paper Award of Neurology'12, SummerMed., WSEAS/NAUN, July 2012.

Plenary Lecture 2

The Usage of Liver Extract Versus Growth Factors in the Differentiation of Mesenchymal Stem Cells into Hepatocyte Like Cells



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Abstract: Liver cell transplantation and cellular-based therapies evolved as viable clinical alternatives to whole organ transplantation required in some liver diseases. Differentiation of stem cells into hepatocyte like cells would provide a renewable source of exogenous hepatocytes for drug toxicity testing and cell-based therapeutics. Many protocols of in vitro differentiation of stem cells into hepatocyte like cells had been employed to check the ability of differentiation as well as the functional efficacy of differentiated cells. But still the exploration of an easy and affordable one is needed to facilitate MSC differentiation into hepatocytes. In this study, we employ three different protocols of differentiation of bone marrow mesenchymal stem cells (MSCs) into hepatocyte-like cells with a view to developing easier and affordable protocol using liver extract versus expensive growth factors cocktails. MSCs were isolated from rat's bone marrow using the plastic adherence technique. Cells were then sub-cultured till passage 3 for their purification and proliferation. CFU-F assay and immunological characterization was done through the flow cytometric analysis of CD29, CD90 and CD45 surface markers. Flasks then were divided into four groups, first; control group cultured in proliferative media. Second group; cells cultured in hepatocytic differentiation media 1 (HDM) 1 containing FGF-4. Third group; cells cultured in HDM2 containing FGF-4 and HGF and finally fourth group; cultured in HDM3 containing liver extract instead of the previously mentioned growth factors. Cells were tested for their differentiation morphologically and functionally through assessing Urea secretion, glycogen storage and gene expression of albumin by RT-PCR. Flow cytometric analysis showed that after passage 3, the cells do not express hematopoietic marker CD 45 but express the two mesenchymal markers CD29 and CD90. Cells cultured in HDM2 and HDM3 showed morphological changes of hepatocyte like cells in day 12 and day 15 respectively, these changes didn't appear neither in control group nor in cells cultured in HDM1. Urea production and secretion by hepatocytes like cells were detected at various time points throughout differentiation. In the HDM 2 and 3 groups cells produced urea 3 d later, and in a time-dependent manner. On d 24, the amount of urea produced by differentiated bone marrow cells reached the maximum amount and was detected with a concentration of 23.06 ± 11.9 mmol/L on HDM 2, and 20.89 ± 10.44 mmol/L on HDM 3. Cells in the control and HDM 1 groups did not secrete any urea. Intracellular glycogen accumulation was analyzed by staining the cells with the PAS reagent. On d 24 accumulation of glycogen was detected in the HDM 2 and 3, while no accumulation of glycogen was found in the other groups. Albumin mRNA was detected by RT-PCR, the results showed that the cells cultivated in HDM 2 and 3 expressed albumin, while in control group and HDM 1 did not. The usage of liver extract in the differentiation of MSCs into hepatocyte like cells proved to be almost as effective as the usual used cocktail of HGF and FGF, yet more affordable and easier approach, thus useful in providing a renewable source of exogenous hepatocytes for drug toxicity testing and cell-based therapeutics.

Brief Biography of the Speaker: Dr Sh. Muawia holds a BSc in Biochemistry from Faculty of Science- Alexandria University-Egypt. She holds a Master degree & a PhD in Biochemistry (1992, 2001 respectively) from the Faculty of Science- Alexandria University. She works as a Professor of Biochemistry and Molecular Biology in the Molecular Biology department in Genetic Engineering and Biotechnology research Institute (GEBRI) - Sadat City University- Sadat City. She is the vice dean of the environmental affairs and community services in the GEBRI.

Her research interests include: Apoptotic signaling pathway and apoptotic markers in different tumors (adult acute myeloid leukemia and in Hepatocellular Carcinoma) and in HCV patients. Single nucleotide polymorphism and gene expression of different genes in various diseases and tumors. Oxidative stress and antioxidant defence beside cytokine expression on the molecular and protein levels. She has 30 publications in highly rated ISI journals and attend 38 conferences.

Authors Index

Abbas, A. A.	112	Jalil, N.	124
Acar, F. G.	88, 91	Jelenc, F.	47, 81
Ahmad, H.	147	Karim, N. H. A.	147
Aylward, N.	39, 75	Lam, J.	124
Boshkoska, B. M.	81	Lavin, A.	11
Breatu, A.-M.	61, 72	Lynn, P. E.	11
Brzdęk, E.	34	Mansour, S. K. A.	112
Chen, J.-P.	105	Misrawati	142
Cheng, T. Y.	130	Mochrosin	130
Cîrlan, C.	95	Muzuni	142
Damij, N.	47, 81	Natori, K.	20
Dehmeshki, J.	28	Oprisan, S. A.	11
Demirbay, B.	88, 91	Petrus, M.	61, 72
Dushanova, J.	137	Popa, C.	61, 72
Ebrahimdoost, Y.	28	Qanadli, S. D.	28
El-Fiky, B. A.	150	Raharjo, S.	142
El-Halfawy, K. A.	150	Rusdin, R.	142
Evingür, G. A.	88	Said, S. M.	124
Fukasawa, A.	20, 54, 65	Sarfina	142
Fukasawa, A.	98	Satria, M. H.	130
Gifari, M. W.	124	Săvulescu, F.	95
Hajiran, S. N.	142	Soetikno, R. D.	118
Halid, N. I. A.	147	Suklan, J.	47
Hanafy, S. M.	112, 150	Supriyanto, E.	118, 124, 130
Harun, S. N.	147	Susilowati, P. E.	142
Hasbullah, S. A.	147	Takeuchi, H.	54, 98
Hassan, H. M.	150	Takizawa, Y.	20, 54, 65
Heng, L. Y.	147	Takizawa, Y.	98
Hermawan, R.	118	Tompa, T.	11
Hikmat, I. H.	118	Yunus, J.	130
Hsu, H.-L.	105	Zielińska, J.	34
Jaganathan, S. K.	118		