PROGRAM BOOK

WC 2006

WC 2006

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"Imaging the Future Medicine"

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The 15th ICMP of IOMP
The 21st ICMBE of IFMBE

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T20 Poster Session (continued) Exhibition Hall

Presenting Time: 09:30 - 10:00 / 14:10 - 14:40

4769. Application of Bamboo Charcoal in Blood Purification: An In-Vitro Study
Ming-Fa Hsieh, Wei-Chieh Wang, Wen-Chi Chen

4770. Synthesis and Characterization of Chitosan/Polyaniline/Carbon Nanotube Microfibres
Su Ryon Shin, Sang Jun Park, Seoung Gil Yoon, Chang Kee Lee, Kwang Min Shin, Min Sup Kim, Bon Kang Gu, Min Kyoon Shin, Yun Jin Kim, Ji Won Lee, Sun I. Kim, Seon Jeong Kim

4771. Study in Chitosan and Imidazolium-Based Ionic Liquids
Chang Kee Lee, Sang Jun Park, Seoung Gil Yoon, Kwang Min Shin, Su Ryon Shin, Bon Kang Gu, Min Sup Kim, Min Kyoon Shin, Yun Jin Kim, Ji Won Lee, Sun I. Kim, Seon Jeong Kim

4772. Adipose Differentiation Kinetic Analysis of Preadipose Cells using FT-IR
Katsunori Ishii, Toshihiro Kushibiki, Kunio Awazu

4773. Gene Expression in Mandibular Growth & in vitro Organ Culture
Jongrak Hong, Ho-Beom Kwon, Pill-Hoon Choung

4774. Enhancement of Proliferation and VEGF Secretion in Osteoblast by Biphasic μ-current Stimulation
Jong Keun Song, In Sook Kim, Yoon Mi Song, Yu Lian Zhang, Tae Hyung Lee, Tae Hyung Cho, Soon Jung Hwang, Sung June Kim

4775. Tissue Regeneration of the Hybrid ePTFE Vascular Graft
Yoon Jeong Choi, Mi Sook Kim, Song Hyun Moon, Ki Sook Park, Hyang Dong Jang, Insup Noh

4776. An Image Analysis Algorithm for Kinematics and Morphology Measurement of Cells for the Evaluation of Tissue Construction
Tomoko Gessei, Chie OHTSUKA, Masatoshi BANNO, Keiichi MIYAMOTO, Yuji OHTA, Takashi HORIUCHI

4777. Synthesis of Electroactive Polymer Hydrogel
Seoung Gil Yoon, Sang Jun Park, Chang Kee Lee, Kwang Min Shin, Su Ryon Shin, Min Sup Kim, Min Kyoon Shin, Yu Jin Kim, Ji Won Lee, Sun I. Kim, Seon Jeong Kim

4778. Synthesis and Characteristics of Electroactive Polymer Hydrogels Composed of Biocompatible Materials
Sang Jun Park, Seoung Gil Yoon, Chang Kee Lee, Kwang Min Shin, Su Ryon Shin, Bon Kang Gu, Min Sup Kim, Min Kyoon Shin, In Young Kim, Sun I. Kim, Seon Jeong Kim

4779. Evaluation and Preparation of Tube Type Nerve Guide for Nerve Tissue Regeneration using Biodegradable Synthetic Polymers through Electro-spinning Method
Hong-Ki Bae, DJ Chung

4780. A Study of the Heating Effect on Mouse Liver After Cryosurgery
Daishi Takahashi, Haruki Nakamura, Kazufumi Shinoda, Ichiro Fukumoto

4781. Manufacture of Biodegradable Scaffold and Cell Adhesion Studies on Different Surface Morphology
Jong Hyun Ko, DJ Chung

4782. Self-Assembled Nanostructures of Bioactive Peptides for Enhanced Tissue Regenerative Efficacy
Jeong Eun Choo, Jue Yeon Lee, Young Sook Choi, Jin Sook Seo, Seun Jin Lee, Chong Pyoung Chung, Yoon Jeong Park

4783. Novel Hybrids of siRNA and Protein Transduction Domain for Improved Therapeutic Efficacy
Young Sook Choi, Jue Yeon Lee, Jeong Eun Choo, Sun Ae Han, Jin Sook Seo, Victor Yang, Yoon Jeong Park

4784. Bioactive Polyurethane Surfaces for the Promotion of Endothelialization
Won Sup Choi, Dong Hyun Go, Jin Woo Bae, Ki Dong Park

4785. Heparinized Thermosensitive PLA as an Injectable Hydrogel for Biomedical Application
Jung Sik Lee, Dong Hyun Go, Jung Seok Lee, Ki Dong Park

4786. Iron Containing Hydroxyapatite Prepared by a Modified Pseudo-Body Solution
Junhu Wang, Toru Nonami

4787. The Preparations of Gelatin Hydrogels – Irradiated in Aqueous Solvents Containing Various Chemical Additives and Their Swelling Behavior Studies
Junhwa Shin, Young Chang Nho

Abstract Preview

Enhancement of Proliferation and VEGF Secretion in Osteoblast by Biphasic μ-current Stimulation

Jong Keun Song[1] In Sook Kim[3], Yoon Mi Song[3], Yu Lian Zhang[3], Tae Hyung Lee[1], Tae Hyung Cho[3], Soon Jung Hwang[2,3], and Sung June Kim[1]

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It has been known that electrical stimulation and pulsed electromagnetic stimulation promote osteogenesis and healing of bone fracture. In this study, we showed that μ-level charge balanced biphasic current stimulation could promote the proliferation of osteoblasts and increase the secretion of the VEGF protein significantly. We designed a current stimulator IC and a specific culture system so that biphasic μ-current pulses might stimulate the osteoblast being on the conductive Au-metal plate fabricated by thermal evaporation on silicon wafer with a thickness of 3,000Å. Each culture system is composed of an upper (Channel Electrode) and lower(Reference Electrode) plate connected with a μ-current stimulator and Teflon® well with a dimension of 30mm X 30mm. Rat calvarias osteoblasts inoculated at a density of 2,500 cells/cm² were exposed to electrical stimulation of 1.5 μA/cm² at 1,000 Hz during 6-hours and 24-hours respectively compared to control without stimulation. After 1 and 2 days with stimulation, the increased cells were counted for measuring proliferation. The number of osteoblasts increased from 33,800 ± 11,292 (mean ± SEM) cells to 44,300 ± 9,287, which represented a 31% increase in proliferation of osteoblasts. VEGF induction At day 4 after exposure to stimulation, mRNA expression was investigated for differentiation-promoting cytokines such as BMP-2, BMP-4, TGF-β1, IGF-1, 2 and angiogenesis-promoting vascular endothelial growth factor(VEGF). The amount of secreted VEGF was measured using an ELISA kit. The VEGF protein was significantly increased in both stimulated group compared to control. In conclusion, this study showed that BEC contributes to enhanced osteogenesis by increasing cell proliferation and by induction of angiogenesis, which are important for initiation of bone formation. Continuous stimulation by BEC was more effective than interrupted exposure. The results in this study indicate that BEC can act as a potential osteogenic inducer. To evaluate this potential effect in bone formation, further studies are needed in vivo.

Keywords : Biphasic Current Stimulation, VEGF Secretion, Proliferation

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