

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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4512. A New Concept for Artificial Support Microspheres Based Detoxification System (MDS) 12:00
V. Weber, J. Hartmann, M. Ettenauer, M. Brandl, Dieter Falkenhagen

4514. New horizons to develop an artificial lung: Initial animal experiments with a 12:15
Kosrow Mottaghy, Ali Kashefi, Bernd Oedekoven, Jan Elstrodt, John Gu, Michiel Erasmus, Gerhard Rakhorst

T20 S4 Tissue Engineering I

11:00-12:15, Tuesday, August 29 330C
 Session Chairs : Dong Keun Han, Yoon Shin Lee

4717. Invited Talk – “Quantifying Mechanical Tension in Cell Monolayers and in Ultra-Thin 3D Tissue Constructs” 11:00
G. Artmann

4718. A Novel Dental Implant Technology for Early Bone Formation by Electrical Stimulation 11:30
Sung June Kim, Soon Jung Hwang, Tae Hyung Lee, Tae Hyung Cho, Jong Keun Song

4719. Coupled Mechanical-Electric Characteristics of Dehydrated Skeletal Muscles by Experimentation 11:45
Yan Yu, Zhende Hou, Zizhen Liu

4720. New Modular Semiautomatic System for Preparation of the Demineralized Bone Matrix for Clinical Transplantation 12:00
P. Kneppo, Jozef Zivcak, R. HUDÁK, J. Rosocha, S. GROMOŠOVÁ

T22 S3 NP1: Auditory Prosthesis

11:00-12:15, Tuesday, August 29 321C
 Session Chairs : Blake Wilson, Kyung Hwan Kim

5028. Infra-Red Cochlear Implant System for Animal Experiments 11:00
Sung June Kim, Seung Ha Oh, Min Hyun Park, Choong Jae Lee, Soon Kwan An

5007. A Speech Processing Strategy for Auditory Prosthesis based on Nonlinear Filterbank Model of Biological Cochlea 11:15
Kyung Hwan Kim, Doo Hee Kim, Jin Ho Kim

5008. Frequency-Specific Fine Structure Cues from Mandarin for Designing Electrical Stimulation Strategy of Cochlear Implant 11:30
Yuan-Ting Zhang, Fei Chen

5009. Performance Evaluation of Cochlear Implant Speech Processing Strategy using Spike Train Decoding 11:45
Kyung Hwan Kim, Jin Ho Kim, Doo Hee Kim

5010. Response Map Generation in Dorsal Cochlear Nucleus: A Computational Model 12:00
Xiaohan Zheng, Herbert Voigt

T23 S4 Anatomy, Bonghan system, Acupuncture and Therapeutic Systems

11:00-12:45, Tuesday, August 29 308
 Session Chairs : Chang-Wei Hsieh, Sun Mi Choi

5112. Alcian Blue Staining Technique for Tracing the Governing Vessel (GV) Meridian in Rat 11:00
Kwang Sup Soh, Byung Cheon Lee, Hak Soo Shin, Yong Hui Han, Vyacheslav Ogay, Min Su Kim

5113. fMRI Evaluation for Acupuncture Treatment on Patients with Depression 11:15
Jeong-Seok Kim, Bo-Young Choe, Moon-Hyun Yoon

5114. The Ability of Quantitative Analysis in Articular Cartilage 11:30
Bo-Young Choe, Moon-Hyun Yoon

5115. Nanoparticles for Tracing Acupuncture Meridians and Bonghan Ducts 11:45
Wan Su Park, Jung Dae Kim, Jin-Kyu Lee, Hak-Soo Shin, Chang-Hoon Lee, Byung-Cheon Lee, Tae-Jong Yoon, Jung-Sun Yoo, Hyeon-Min Johng, Kwang-Sup Soh

5116. The Effect of Cardiovascular System According to The Hot Water-Induced Stimulation on Foot 12:00
Sang-Geun Kim, Hyo Shin Kim, Ki-Young Shin, Jeong-Hoon Park, Woo-Cheol Lee, Kyoung-Kee Min

Infra-Red Cochlear Implant System for Animal Experiments

Soon Kwan An^{1,3}, Choong Jae Lee^{1,3}, Min Hyun Park^{2,3}, Seung Ha Oh^{2,3}, and Sung June Kim^{1,3}

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Cochlear implant system is one of the most advanced neural prosthetic devices, and a lot of hearing-impaired people have recovered their auditory functions by using these systems. However, there still exist personal differences in the patients' speech perception performances after the cochlear implantations. To find and explain the reasons of these differences, the physiological response property and the central auditory plasticity after long-term cochlear implantation have been studied. In those studies, animal experiments have been preferred because the experiments with human subject are highly limited, and observing the behavioral response of the animal is very important. To do that, the animal cochlear implant system should provide complex stimulus similar to those of the human cochlear implant and also be small, light-weighted. In early animal experiments, simple cochlear stimulator or single channel human cochlear implant system were used. These are simple and light-weighted, but could not provide sound stimulations similar to natural and complex sounds. Alternatively, commercial multi-channel human cochlear implant systems can be adapted. These systems implement multi-channel digital coding strategies thus providing complex electrical stimulus according to natural sounds. However, they are too large and heavy for animals to move freely with them and need frequent replacement of batteries because of the high power consumption. In this paper, we suggest a new cochlear implant system for freely moving animals. In our system, the power demanding sound processor is located on the experimental cage where external power is available. The animal carries a small, light-weighted receiver/stimulator package with a small battery only, which communicates with the sound processor via the infra-red (IR) telemetry. This system enables animals move freely with still implementing multi-channel digital coding strategies, thus will be a very useful tools for various animal experiments.

Keywords : Cochlear Implant, Neural Prosthesis, Infra-Red Telemetry