

Table of Contents

Foreword

Chapter 1: Biomimetic Research

Grasshopper Knee Joint – Inverse Kinematic Modeling and Simulation of Ionic Polymer

Metal Composites (IPMC) Actuators

M. Farid, Z. Gang, T.L. Khuong, Z.Z. Sun and N. Ur Rehman

1

Grasshopper Knee Joint - Torque Analysis of Actuators Using Ionic Polymer Metal Composites (IPMC)

M. Farid, Z. Gang, T.L. Khuong and Z.Z. Sun

13

Effect of Unilateral Non-Rhythmic Stimulation on Bilateral Cerebral Cortex and Muscle Activation in People

J.F. Sui, Y.L. Liu and L.H. Ji

25

Chapter 2: Biomaterials and Technologies in Tissue Engineering

Synthesis and Characterization of Hydroxyapatite Powder from Natural Bovine Bone

M. Wasim, R.S. Malik, M.U. Tufail, A.U. Jutt, R. Ahmad and K.M. Deen

35

Advances on Biomedical Titanium Surface Interactions

M. Bousnaki and P. Koidis

43

Strong and Bioactive Tri-Calcium Phosphate Scaffolds with Tube-Like Macropores

W. Zheng, G. Liu, C. Yan, Y. Xiao and X.G. Miao

65

Effects of Cell Density on Mechanical Properties of Alginate Hydrogel Tissue Scaffolds

X.Y. Tian and X.B. Chen

77

Damping Micromechanisms for Bones above Room Temperature

O.A. Lambri, J.I. Pérez-Landazábal, F.G. Bonifacich, V. Recarte, M.L. Lambri, G.I. Zelada, F. Tarditti and D. Gargicevich

87

Resorbable Polymer Membranes for Medical Applications

E. Stodolak-Zych, A. Łuszcz, E. Menaszek and A. Ścisłowska-Czarencka

99

Comparative *In Vivo* Study of Biocompatibility of Apatites Incorporated with 1% Zinc or Lead Ions versus Stoichiometric Hydroxyapatite

B. Giorno, I.I. Castro-Silva, A. Malta Rossi and J.M. Granjeiro

109