
Editorial

Nicholas Dunne*

School of Mechanical and Aerospace Engineering,
Queen's University Belfast,
Ashby Building Stranmillis Road,
Belfast, BT9 5AH, UK
Fax: +44-28-90661729
E-mail: n.dunne@qub.ac.uk
*Corresponding author

Izabela-Cristina Stancu

Department of Polymer Chemistry and Technology,
Faculty of Applied Chemistry and Materials Science,
University Politehnica of Bucharest,
Calea Victoriei 149, 010072, Bucharest, Romania
E-mail: izabela.cristina.stancu@gmail.com
E-mail: stancu.c.i@gmail.com

Iulian Vasile Antoniac

Faculty of Materials Science and Engineering,
University Politehnica of Bucharest,
313 Splaiul Independentei, 060042, Bucharest, Romania
E-mail: antoniac.iulian@gmail.com
E-mail: i_antoniac@yahoo.com

Biographical notes: Nicholas Dunne is a Reader of Biomaterials Engineering and has been awarded the prestigious Leverhulme Trust Senior Research Fellowship by the Royal Academy of Engineering (2010) and an Orthopaedic Research Society/British Orthopaedic Research Society Fellowship (2008). He is an academic member of the Polymer Research Cluster at QUB. He has developed a strong, translational research programme focusing on two main areas: optimisation strategies for injectable PMMA and calcium phosphate bone cement systems used for hard tissue repair and regeneration; and design, development and in vitro characterisation of tissue engineered bone scaffolds for load-bearing applications.

Izabela-Cristina Stancu is a Lecturer in the field of polymer physics and biomaterials at the Faculty of Applied Chemistry and Materials Science from University Politehnica of Bucharest. Her research interests cover the synthesis and characterisation of polymer biomaterials, including porous scaffolds with interconnected porosity, nanostructured surfaces, complex multicomponent polymer systems, and functionalisation of polymers.

Iulian Vasile Antoniac is a Senior Lecturer, Head of the Interface Phenomenon Laboratory, Department of Materials Science and Physical Metallurgy, Faculty of Materials Science and Engineering, University Politehnica of Bucharest. As he coordinates several research groups in the biomaterials domain, his research interests have a wide area, ranging from scaffolds and bioresorbable materials of various biomedical application to new protocols for retrieval analysis and microscopy for materials characterisation (optical microscopy, scanning electron microscopy, atomic force microscopy).

The last years have lead to substantial progress in the field of biomaterials science. Increasing life expectancy became prioritary and in this aim research trends like the development of smart biomaterials and the intelligent design of functional biomedical devices developed rapidly. Modern approaches attracted major changes like advancing from tissue replacement to regeneration, from 2D to 3D, from macro- to micro- and nanoscale, and from inert to bioactive materials. The efforts of the entire biomaterials research community converge to an enhanced life quality.

This special issue is devoted to current trends and developments in the field of biomaterials, tissue engineering and medical devices. This volume targets basic research and developments ranging from experimental, theoretical and computational aspects to final applications of biomaterials. The seven works presented in this volume represent the extended versions of lectures presented at the 4th International Conference 'Biomaterials, Tissue Engineering and Medical Devices' 2010 (23–25th September, Sinaia, Romania).

The preparation and characterisation of radio-opaque polymeric micro- and nanoparticles based on methyl methacrylate and 2,4,6-triiodophenyl acrylate were presented by Zaharia et al. in the first paper. Because these copolymers exhibit good in vitro cell compatibility and good X-ray visibility, it was concluded that they are good candidates for tumoural detection and imaging. The second excellent paper, by Leonida et al. describes the synthesis of chitosan nanoparticles and metal-enhanced chitosan nanoparticles prepared by ionic gelation. The antimicrobial activity and the skin regenerative potential of these materials were investigated. The study suggests that chitosan and its nanoparticles may inhibit skin aging and facilitate the ECM remodelling phase of wound healing. In the third paper, Eremia et al. present the preparation of polymeric membranes based on poly-3-hydroxybutyrate and chitosan with variable biodegradation time, adsorption capacity, and different drug release capacity. Serine protease inhibitors were combined with the biodegradable materials and their proteolytic activity, porous structure, and increased hydrophilicity indicate their potential use for drug delivery and tissue engineering. In the next work, Prejmerean et al. investigated the surface morphology and roughness of three new experimental resin-based composites containing different inorganic fillers. The fifth paper by P-L. Cevei and M-L. Cevei presents the determination of pulse using the electrical impedance method at the wrist. It was found that the arm geometry deformation due to motion induces conductivity changes similar in magnitude with the blood related changes. Further on, the paper by Atasiei et al. tries to summarise the causes of failure of metal-on-metal hip resurfacing arthroplasty and offers few examples based on the authors' own experience with this procedure. The final paper by Bechir et al. investigates the causes of structural defects in a partial fissured aesthetic dental bridge.

We hope that this special issue will serve as a reference volume consisting of high quality research papers especially for researchers in the field of biomaterials. Experts in

the field of biomaterials and bioengineering have been extremely helpful and have refereed the papers presented in this volume. We wish to thank them for their reviews and the authors for submitting their research papers.