Preface

JBBTE is one of the few journals in the biomaterials and tissue engineering realm that publishes both research papers and review papers, and this journal spans the diverse but closely interrelated fields of Biomimetics, Biomaterials, and Tissue Engineering. This volume (volume 17) comprises 8 papers, including a key review on 3D printing of cell-scaffold constructs, a technology by which organs could be directly manufactured. Volume 17 also has one of the first ever reports of microfibre-reinforced hydroxyapatite that combines bioactivity with the mechanical properties of bone. All 8 papers in this volume have a unique contribution to make to the interconnected fields of biomimetics, biomaterials, and tissue engineering.

1. Tian, Li, and Chen (Canada) present a cutting-edge **tissue engineering review** on one of the most important areas of tissue engineering: bio-Rapid-Prototyping, i.e., direct 3D-printing of scaffolds with encapsulated cells, a process which can potentially be used to directly **manufacture replacement organs using the patient's own cells**. It is widely believed that bio-Rapid-Prototyping is the enabling technology for the dream of tissue engineered organs to become a reality. This is a comprehensive review, 23 pages long, with 137 references, that is a must read for anyone interested in the future of tissue engineering.

2. Persaud-Sharma, Budiansky, and McGoron (USA) present a **biomaterials** study of magnesium alloys. Alloys containing zinc, copper and selenium were studied Biodegradable magnesium alloys are widely believed to be the future for stent technology. The focus in this study was on cytotoxicity and biocompatibility.

3. Bao (China) presents a **biomaterials** study on magnesium alloy (Mg-Y-Ca-Zn) with the focus on metallurgical optimisation to maximise corrosion resistance. Biodegradable magnesium alloys are widely believed to be the future for stent technology if only the degradation rate can be reduced and better controlled, a primary focus of this paper.

4. Al-Zu'be, Al-Momani, Al-Bataineh, and Tahtamouni (Jordan) present a **biomaterials** study on the use of calcium sulfate and tricalcium phosphate suspensions as a slow-release drug delivery system for insulin. The application was bone fracture healing since insulin can normalize early parameters of fracture healing.

5. Asgari, Azami, Amiri, Fooladi, and Nourani (Iran) present a **biomaterials and biomimetics** study involving a gelatin scaffold doped with nanoparticules of calcium and magnesium apatites. The study focusses on scaffold synthesis, physical characterisation, and cytotoxicity testing.

6. Verma and Trehan (India) present a **biomimetics** investigation of the naturally occurring flavinoid *Quercentin* which is of interest as an antioxidant, anti-inflammatory and anti-cancer agent. The focus was on the use of Molecularly Imprinted Polymers (MIPs) for extraction of quercetin from herbs in a one step process.

All rights reserved. No part of contents of this paper may be reproduced, processed or transmitted in any form or by any means without the written permission of Trans Tech Publications Ltd, www.scientific.net. (#0-12/09/25,18:07:32)

7. Adib, Naim, Hasni, and Osman (Malaysia) present a **biomimetics** study involving a computerised fluid dynamics analysis of blood flow in mitral leaflet valves, with the focus on investigating the effect of valve shape.

8. Ehsani, Ruys, and Sorrell (Iran), present a **biomaterials** study which is one of the first ever reports of a hydroxyapatite material that has the mechanical properties of bone. Ordinarily, hydroxyapatite is as brittle as glass and so the excellent bioactivity of hydroxyapatite can only be harnessed commercially by using it in plasma-sprayed coatings on metallic implants. This study reports microfibre-reinforced hydroxyapatite and presents the exciting possibility of bulk hydroxyapatite load-bearing orthopaedic implants.

All of these papers document cutting edge research in the interrelated disciplines of biomaterials and tissue engineering. The review of 3D printing of cell-populated scaffolds is a highlight of volume 17, but the other 7 research papers also have a strong contribution to make to research advancement in the field. Thus Volume 17 of the Journal of Biomimetics, Biomaterials, and Tissue Engineering makes compelling reading for researchers and clinicians wishing to keep up with cutting edge developments in the three inter-related disciplines of Biomimetics, Biomaterials, and Tissue Engineering.

Professor Andrew Ruys
Editor in Chief: JBBTE
March 2013