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Editorial

2nd TMS Symposium on biological materials science

This volume contains the peer-reviewed proceedings of the Second Symposium on Biological Materials Science, held during the Annual Meeting of The Mineral Metals and Materials Society (TMS) (March 12–16, 2006, San Antonio, TX). The second symposium firmly marked the entry of the newly formed Biological Materials Committee into the TMS community. The event was co-sponsored by two divisions within TMS, the Materials Processing & Manufacturing Division (EPMD) and the Structural Materials Division (SMD), and partially supported by TMS funds. The principal theme of this symposium was the interaction of materials and biological systems, an area that is emerging as a new frontier in Materials Science and Engineering. The Biology-Materials connection is a fertile field of research with limitless possibilities.

Some of the main areas of research and activity in this field which were covered in the symposium are:

- Biological materials: materials and systems encountered in nature,
- Bioinspired and biomimetic materials: approaches to synthesizing materials,
- Biomaterials: materials specifically designed for optimum compatibility with biological systems (e.g., implants),
- Functional biomaterials and devices.

The symposium participants included many eminent scientists working at the intersection of biology and materials science such as the keynote speaker, Professor William Bonfield from Cambridge University, who presented a new direction in skeletal implants by the use of hydroxyapatite reinforced polyethylene composite (HAPEX(TM)) as a second generation biomaterial for bone substitution. Additionally, there were 15 invited contributions on a broad range of topics, including: work on the toughness of bones and teeth (R. Ritchie, UC Berkeley), mechanical properties of internal organs and cells (M. Sato, Tohoku University), genetically engineered proteins (M. Sarikaya, U. Washington and C. Tamerler, Istanbul Technical University), modifications of human cells in disease (C.T. Lim, National University of Singapore), mechanotransduction in cells (M. Sokabe, Nagoya University), printing of biological materials (P. Calvert, U. Massachusetts), organic layers in abalone nacre (M. Meyers, UC San Diego), biomineralization (C. Orme and R. Qui, Lawrence Livermore National Laboratory), modeling of erythrocyte deformation (M. Dao and S. Suresh, MIT), and cell growth and adhesion (S. Jin, UC San Diego).

As part of the Biological Materials Committee's efforts to bring exposure and discussion of biological materials science to the materials science community, two additional speakers, Professors Lawrence Murr (U. Texas, El Paso) and Mark Hersam (Northwestern University) were invited to participate in the symposium and give an overview of the history and curriculum issues involving biological materials science.

The manuscripts included in this volume are a select compilation of the contributions presented at the meeting, all of which were peer reviewed following the strict guidelines and requirements of *Acta Biomaterialia*. We are grateful to Andrea Musher for having patiently and competently managed the entire and extensive editing process. As a result of this effort, thirteen contributions were accepted into this volume. We thank Professor William Wagner, *Acta Biomaterialia* editor, for accepting these proceedings into the journal. We hope that this document is both timely and important. We thank the participants, authors of the papers in these proceedings, and the reviewers. Their collective effort has resulted in a most impressive volume which should contribute significantly to the literature of this field.

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