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Advanced Materials for Biological and Biomedical Applications

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Advanced Materials for Biological and Biomedical Applications

Symposium held April 1–5, 2013, San Francisco, California U.S.A.

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*Invited Paper

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PREFACE

This MRS Proceedings volume pulls together several symposia on related topics in the area of biomaterials, all of which were held April 1–5 at the 2013 MRS Spring Meeting in San Francisco, California:

Symposium LL, "Hybrid Inorganic-Biological Materials,"

Symposium MM, "New Tools for Cancer Using Nanomaterials, Nanostructures, and Nanodevices,"

Symposium NN, "Multifunctional Biomaterials," and

Symposium QQ, "Conjugated Polymers in Sensing and Biomedical Applications."

Research in the field of biomaterials is progressing rapidly. Biomaterials that can mimic functions of natural tissue and can provide, receive, and respond to signals from their environment are the key topic of fundamental as well as translational research. These signals include interactions with synthetic molecules, biological species, and physical stimuli. Recently the concept of functions independent of the materials basis turned out as a promising pathway. Of particular interest are multifunctional materials. This symposium proceedings volume represents recent advances in materials sciences for biomedical applications, including inorganic, hybrid, and polymeric biomaterials. The papers are divided into five sections: (1) Multifunctional Biomaterials, (2) Interface of (Multifunctional) Biomaterials, (3) Responsive Multifunctional Biomaterials, (4) Particulate Biomaterials, and (5) Multifunctional Biomaterials in Sensors and Applications. Each paper of this volume reflects one piece of the puzzle of the exciting recent developments occurring in the broad field of biomaterials such as stimuli-sensitive polymer composite materials, smart or active materials, efficient drug delivery vehicles, and novel sensor applications. We hope that these papers convey the breadth of exciting advancements happening in the area of biomaterials.

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The papers published in this volume result from three MRS Spring 2013 symposia—LL, MM, NN, and QQ. We sincerely thank all of the oral and poster presenters of the symposia who contributed to this proceedings volume. In addition we thank the reviewers of these manuscripts for their valuable feedback to the editors and to the authors. Furthermore, we greatly acknowledge the organizational help of the Materials Research Society and its staff, particularly the Publications staff for guiding us smoothly through the submission/review process. The organizers of Symposium NN thank the Biomedical Polymers Laboratory of the Soochow University, Suzhou, China, the Jiangsu Key Laboratory of Advanced Functional Polymer Design and Application (Soochow University), Suzhou, China, and Aldrich Materials Science for their generous financial support.

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