

Preface

In the first place the editors of this special volume would like to thank all authors for their excellent contributions to this volume addressing the exciting field of cell–surface interactions, with special focus on tissue generation. We would also like to thank Prof. Dr. Thomas Scheper, Dr. Marion Hertel and Karin Bartsch for providing the opportunity to compose this volume and Springer for organizational and technical support.

The growth of three dimensional tissues is a rapidly expanding field in modern medicinal biotechnology. Many different aspects play a role in the formation of 3D tissue structures and the source of the used cells is especially important. To prevent tissue rejection or immune response, nowadays, preferentially autologous cells are used. In particular, stem cells from different sources are gaining exceptional importance, as they can be differentiated into different tissues by using special medium compositions and supplements. In the field of biomaterials, numerous scaffold materials already exist but also new composites are being developed based on polymeric, natural or xenogenic sources. A very important issue in tissue engineering is the formation of tissues under well defined, controlled and reproducible conditions. Therefore, a substantial number of new bioreactors have been developed. Two volumes previously published in this series addressed “Bioreactor Systems for Tissue Engineering” (Vol. 112) and “Strategies for the Expansion and Directed Differentiation of Stem Cells” (Vol. 123). Here we focus on the interaction of cells and materials. The knowledge and expertise of the authors covers disciplines like material sciences, engineering, biotechnology and clinical sciences. Recent advances in material development, evaluation and design of biocompatibility, analytical tools for effects of cell–surface interactions, as well as cutting edge applications of new materials (stem cell differentiation, cardiac, cartilage and bone tissue engineering) are also discussed.

We hope that this state-of-the-art volume is helpful for your research. Please enjoy reading it, as much as we enjoyed preparing it.

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Cornelia Kasper
Frank Witte
Ralf Pörtner

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Kasper, C.; Witte, F.; Pörtner, R. (Eds.)

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