

Preface

The idea of a *Special Issue on Biomedical Manufacturing* originated from the Editor, Dr. Kornel Ehmann, during the 2006 ASME Manufacturing Science and Engineering Conference held in Ypsilanti, Michigan. In retrospect, not only was it a recognition of the growing importance of all aspects of biomedical science and technology but also very timely for the manufacturing community that needs to respond to the challenges imposed by the emergence of novel biomedical products and technologies.

Many of our colleagues share the concern that manufacturing research is stagnating and is at a crossroads. As contributions from the manufacturing sector to employment and to the GDP have declined over the past three decades, some people have come to believe that manufacturing, and manufacturing research, is no longer modern or state-of-the-art. The manufacturing research community as a whole needs to address this incorrect perception by connecting our research to societal needs and excelling in our contributions to the end-value of products and processes.

Healthcare is recognized as one of the mega-trends in society that is becoming the focus of ever more research and economic activity. Pioneering manufacturing researchers have long ago recognized this trend and started to make significant contributions to this field. For example, one of Dr. Stephen Malkin's often cited ASME publications from the 1970s is on orthogonal machining of bone. In the intervening years, many manufacturing researchers have also recognized biomedical manufacturing as a new frontier and have conducted outstanding studies. The goal of this special issue is to collect and present these research activities and organize them into a coherent volume. This *Special Issue on Biomedical Manufacturing* seeks to demonstrate to society and the research community that this new frontier of manufacturing research is innovative and dynamic. Our aim is to encourage more researchers to pursue research in this area, with a common goal of improving the future of healthcare services.

This special issue is a collection of 18 technical papers and 3 technical briefs. It covers a wide range of research topics including an overview of the definition of biomedical manufacturing, and papers on micro-scale biomedical devices, cell scaffolding, surgical thermal management, biocompatible coatings, computer-aided design and manufacturing (CAD/CAM), and biodegradable/biocompatible materials. These papers show the enormous breadth and depth of biomedical manufacturing research. Working together, we believe that manufacturing is an important part of the solution to overcoming the challenges faced in healthcare worldwide.

In closing, we wish to thank the authors and reviewers, as well as Dr. Kornel Ehmann (Editor) and Mariela Huber (Secretary) of the *ASME Journal of Manufacturing Science and Engineering*. Their dedication has helped to transform this *Special Issue of Biomedical Manufacturing* from an idea into reality.

Guest Editors,

Albert J. Shih

Professor

Mechanical Engineering, Biomedical Engineering,
University of Michigan,
Ann Arbor, MI

Dong-Woo Cho

Professor

Mechanical Engineering,
Pohang University of Science and Technology,
Pohang, S. Korea