Preface to Special Topic: Applied Biophysics

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In recent years, the field of medical biophysics and bioengineering/biotechnologies expanded internationally at a very rapid pace. A direct result of this trend has been that *Journal of Applied Physics*—a leading peer-review publication in fields linking physics to applications—has witnessed a very substantial increase in the submission of manuscripts in applied biophysics. In order to encourage the further expansion of this rigorously growing, relatively new and important area of applied physics, and bring it to international focus, in late 2007, we embarked in a mission to edit a Special Topic section of the Journal in the general area of Applied Biophysics. The Journal Editor, P. James Viccaro, and the leadership of the American Institute of Physics have given us their unequivocal support. In order to be as selective as possible among a very large number of research themes in the field, the decision was made that a relatively small number of invited papers and review articles would be grouped together in this Special Topic section without regard to manuscript length. The aim was to seek out contributions in a number of important subfields of rapid growth and impact. The difficult task of selecting topics representing key international research was alleviated by the tireless efforts of the Guest Editors of this section, Andreas Mandelis (University of Toronto, Canada), Gerald (Gerry) Diebold (Brown University, USA), Takehiko Kitamori and Akihide Hibara (University of Tokyo, Japan), and Alex Vitkin (Ontario Cancer Institute, Canada). In the interim year, the task of solicitation of papers based on peer recommendations and individual editor knowledge of the various subfields resulted in the collection of 48 papers included in this issue of the journal. Broadly, the papers fall in one or more of seven theme areas. These areas have been categorized according to the physical principle, methodologies, and techniques used to carry out the research described in the paper; they are as follows:

- x rays, imaging, MRI,[1–10]
- microfluidic and chemomechanical diagnostics,[11–14]
- microchips and microsensors,[15–21]
- diffusion waves, photoacoustic and photothermal diagnostics in turbid media,[22–31]
- optics and spectroscopy,[32–42]
- electrofluidic and conductance biosensors,[43–46] and
- diagnostic reviews in dental biophysics.[47,48]

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