Preface

Nanobiophotonics is designed to serve as a desktop reference for the field at the boundary between nanotechnology, photonics, and biomedicine. Although this interdisciplinary topic is of current, specialized research interest, the authors contributed preparatory material, which makes the book accessible to both students and scholars outside the field. To this end, the book consists of 16 chapters, grouped in three different parts, which reflect the progression from introductory to specialized topics. The Introduction covers the basics of cancer cell biology, electromagnetic fields and nano-optics. In the Review of Methods, the reader is exposed to a number of techniques of broad interest: tissue pathology, light scattering, second-harmonic generation, vision restoration, low-coherence interferometry, plasmonics, and metamaterials. Finally, Part III Current Research Areas cover a range of active research directions: infrared spectroscopic imaging, coherence imaging, second-harmonic imaging, plasmonics and plasmon resonance energy transfer, nanoscale red blood cell fluctuations, super-resolution microscopy, and spatial light interference microscopy.

The authors organized the 2009 Nanobiophotonics Summer School at University of Illinois at Urbana–Champaign, during the period of June 1 - June 12, 2009. The school was sponsored by the Network for Computational Nanotechnology (NCN), which is funded by the National Science Foundation.

Nanobiophotonics would not have been possible without the support from NCN and nanoHub, National Science Foundation, Beckman Institute for Advanced Science and Technology, Materials Computing Center, and Department of Electrical and Computer Engineering. Crucial in organizing the summer school were Umberto Ravaioli, Nahil Sobh, and Julie McCartney.