Preface

Biophotonics deals with interactions between light and biological matter. It is an exciting frontier which involves a fusion of photonics and biology. It offers great hope for the early detection of diseases and for new modalities of light-guided and light-activated therapies. Also, biology is advancing photonics, since biomaterials are showing promise in the development of new photonic media for technological applications.

Biophotonics creates many opportunities for chemists, physicists, engineers, health professionals and biomedical researchers. Also, producing trained healthcare personnel and new generations of researchers in biophotonics is of the utmost importance to keep up with the increasing worldwide demands.

Although several books and journals exist that cover selective aspects of biophotonics, there is a void for a monograph that provides a unified synthesis of this subject. This book provides such an overview of biophotonics which is intended for multidisciplinary readership. The objective is to provide a basic knowledge of a broad range of topics so that individuals in all disciplines can rapidly acquire the minimal necessary background for research and development in biophotonics. The author intends that this book serve both as a textbook for education and training as well as a reference book that aids research and development of those areas integrating light, photonics and biological systems. Another aim of the book is to stimulate the interest of researchers and healthcare professionals and to foster collaboration through multidisciplinary programs.

This book encompasses the fundamentals and various applications involving the integration of light, photonics and biology into biophotonics. Each chapter begins with an introduction describing what a reader will find in that chapter. Each chapter ends with highlights which are basically the take home message and may serve as a review of the materials presented.

In each of the chapters, a description of future directions of research and development is also provided, as well as a brief discussion of the current status, identifying some of areas of future opportunities. A few of the existing commercial sources of instrumentation and supplies relevant to the content of many of the applications chapters (7 and higher) are listed in the respective chapters.

In order to author a book such as this, which covers a very broad range of topics, I received help from a large number of individuals at the Institute for

Lasers, Photonics and Biophotonics and from elsewhere. This help has consisted of gathering technical content, making illustrations, providing critiques and preparing the manuscript. A separate Acknowledgement recognizes these individuals.

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