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Preface

Our objective in assembling this excellent series of chapters into one book was to provide an overview for scientists, engineers, and clinicians on the cutting-edge optical technologies used for the management of diseases of the head, neck, and upper airway as well as on traditional surgical photonic applications which have stood the test of time and yet provide enough potential for further development. It is by no means meant to be a comprehensive treatise on all uses of optical technologies in the head and neck. We have selected topics which we believe have significant potential for the innovation and evolution of technology.

The use of optical technologies in the otolaryngology—head and neck surgery started in the 1970s with the pioneering work of Jako, Strong, and Vaughn in Boston who introduced the laser as a tool for laryngeal and pharyngeal cancer operations. Later, with refinement in technology and delivery systems, surgical applications broadened to middle ear surgery, in particular for the surgical treatment of otosclerosis (“stapes surgery”). In the 1980s, unprecedented funding in the United States was available for fundamental research as a consequence of the Reagan administration’s Strategic Defense Initiative. This was a windfall for the optics industry, and there was an immense spillover of technology into many civilian application areas including medicine. In 1988, at SPIE OE/LASE (then held in Los Angeles), biomedical optics was broken out as a separate session. A year later, the pioneering efforts of Abraham Katzir led to the formation of the Biomedical Optics Society. In 1995, the Biomedical Optics Symposium or “BiOS” as we know it today moved to San Jose forming Photonics West and has grown to include dozens of clinical disciplines, encompassing over 2000 oral presentations per year. The otolaryngology sessions have grown commensurately.

This book would not be possible without the input, contributions, and efforts from participants of the Otolaryngology—Head and Neck Surgery section at the SPIE Biomedical Optics Symposium. The winter “ENT” conferences at BiOS have grown and evolved over 20+ years originally focusing on purely surgical applications of lasers to the current emphasis on the broader use of optical technologies to study diseases of the head and neck, special senses and sensory organs, and the upper airway. Early leaders at BiOS include Stanley Shapshay, Hans Scherer, and Robert Ossoff. They fostered innovation in light-based therapies and diagnostics and saw the importance of creating a venue linking scientists, engineers, and clinicians. We have been honored to continue this tradition for the past 15 years.

Likewise, there is a second generation of clinicians and scientists who have contributed to the growth of optics in the management and study of head and neck disease. It is also important to recognize the contributions of many fellows of the Head and Neck Optical Diagnostics Society. “HNODS” was founded 7 years ago by Colin Hopper at University College London. HNODS is an umbrella organization through which the interest of those doing research in optical imaging and photodynamic related therapies could be further united as expertise and interest in diseases of the head and neck are spread across multiple specialties in Europe, unlike the United States, where Otolaryngology is dominant. Five international HNODS meetings (London, San Francisco (×2), Innsbruck, Orlando, Munich) have been held and a small international working group including Waseem Jerjes

and Christian Betz has provided a venue for dissemination of information, collaboration, and growth particularly with photodynamic therapy, where regulatory issues in North America have made clinical evaluation and trial challenging.

Again, we view this volume as providing a cutting-edge review of emerging optical technologies for use in treating disorders of the head, neck, and upper airway. We hope that this provides scientists, engineers, and clinicians with an overview of this field and a starting point for future detailed study.

We would also like to acknowledge the participation of some key contributors to this volume who are also leaders in this field, in particular Colin Hooper, Waseem Jerjes, and Christian Betz. Finally, this volume would not have been possible at all without the support and guidance of Rebecca Amos and Daniel Dominguez at Springer.

Finally, we dedicate this book to our clinical teachers as well as our patients who have taught us so much about the need to develop better technologies to treat the most complex disorders that encompass the head and neck.

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Biomedical Optics in Otorhinolaryngology

Head and Neck Surgery

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