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Photonic Therapeutics and Diagnostics X

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Introduction

The field of Otolaryngology, Head and Neck Surgery continues to be a challenging specialty for the application of novel diagnostic methods and therapeutic concepts. The contributions presented at the conference and issued hereafter reflect the responses to this challenge. The evolution of optical diagnostics, namely optical coherence tomography in its variants, fluorescence imaging, elastic scattering spectroscopy, confocal laser scanning microscopy has proceeded to an extent that most of the research presented is related to in vivo studies compared to more in vitro oriented projects of previous years. Moreover, many practical issues regarding the usability of optical diagnostic devices have been addressed, such as integrating OCT scanners in handheld otoscopes or the automated working distance adjustment for an OCT scanner in a conventional handheld laryngoscope. On the side of basic science, OCT scanners have become capable of scanning vibrational modes of the human tympanic membrane over a wide range of frequencies, thereby confirming data that have been postulated from finite element models in past years.

In addition to practical issues concerning the use of photonic imaging devices, increasing their predictive value compared to current diagnostic procedures and standards is of importance. Many workgroups have successfully combined variants of these imaging modalities in order to increase specificity and sensitivity in contrast to one method alone for differentiating benign, pre-malignant and malignant lesions of inner mucosal and outer skin surfaces of the head and neck. Co-registering and co-locating two-dimensional images from different methods and different orientation of the same lesion further helps to understand patterns of cellular growth in the context of pre-malignant and malignant neoplasms. This understanding enables the physician to tailor therapeutic regimes for the benefit of the patient, maximizing therapeutic security while minimizing loss of organ function and adverse effects.

In this context, the conference has been co-located with the annual scientific meeting of the Head and Neck Optical Diagnostic Society (HNODS) successfully for the second time. Within the scope of the society is also the propagation of minimally invasive therapeutic concepts in photodynamic therapy. Key research over the past years has been, among others, establishing and validating reliable dosimetry regimes for interstitial and superficial applications of PDT.

As photonics diagnostic and therapeutic technology will undoubtedly advance and mature in future years, one of the main challenges will be to propagate its use in clinical settings on a broad scale, generating a broad knowledge base for future research and increasing the quality of medical care in general for a greater public.

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Justus F. Ilgner