

Optical Methods in Vascular Biology and Medicine

The present-day vascular researcher has an impressive array of tools at his/her disposal. Advances in optical techniques have enabled noninvasive, *in situ* characterization of the anatomic and functional state of the vasculature. Specifically, the development of nonlinear optical microscopy and optical coherence tomography (OCT) has enabled depth-resolved, high-resolution imaging of important vascular features such as vulnerable plaques and tumor microcirculation. Furthermore, the ever-increasing number of molecular reporters and transgenic animal models has enabled researchers to image vascular-specific architectural features and functional states (i.e., gene expression) with exquisite specificity.

This special section on optical methods in vascular medicine serves as a comprehensive overview of research at the intersection of photonics technologies and important biological and biomedical problems related to the cardiovascular system. A total of 14 outstanding papers were selected for publication, including five invited articles which review the current state of vascular imaging using a variety of optical techniques: photoacoustics (Hu and Wang), functional optical microscopy (Salazar Vazquez et al.), cardiovascular OCT (Tanaka, Tearney, and Bouma), fluorescence lifetime microscopy (Marcu), and wide-field laser speckle contrast imaging (Boas and Dunn). The

remaining articles span three topic areas of vascular photonics: (1) interventional cardiology, (2) wide-field optical imaging, and (3) oncology.

We greatly appreciate the contributions of the authors and reviewers to this special section of the *Journal of Biomedical Optics*. We believe that you will find the papers to be insightful and thought provoking, and we hope they will inspire the development of new breakthroughs in vascular photonics.

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Special Section Guest Editors