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Book Review

Intravital Microcirculation Imaging, Christian Lehmann, Ed., Pabst Science Publishers, Lengerich, Germany, 2012, ISBN 978-3-89967-786-7, 120 pages.

Macrocirculation deals with the circulation of blood in the bigger vessels while microcirculation comprises the terminal vessels itself as well as the circulation in arterioles (small arteries lower 300 μm), to capillaries (down to 2–3 μm), to venules (small veins lower than 300 μm). The microcirculation is essential to many functions of the organism.

In addition to delivering oxygen and nutrients for the tissue and removing waste products, the microcirculation plays an essential role in fluid exchange between blood and tissue, delivery of hormones from endocrine glands to target organs, bulk delivery between organs for storage or synthesis and providing a line of defense against pathogens.

Microcirculatory studies most commonly involve direct observation under the microscope as in the examples given in the book.

Intravital microscopy is considered as the gold standard for *in vivo* investigations of dynamic microvascular regulation and has developed into an exciting and powerful technique whose potential has not yet been fully explored.

The study of the microcirculation by intravital microscopy represents a sophisticated research tool to analyze complex disease mechanisms, biological interactions as well as the influence of novel therapeutic drugs aimed to prevent the manifestation of disease-associated microvascular disorders and cellular dysfunction. This includes the pathogenesis of atherosclerotic diseases, thrombotic events, angiogenesis, fibrosis and cirrhosis as well as hypertension, diabetes mellitus, lipid metabolism disorders and tumorogenesis. Moreover, using microscopic techniques, circulatory and cellular disorders in surgical diseases and procedures, such as shock and resuscitation, ischemia/reperfusion, transplantation, trauma, sepsis and inflammation, as well as burn injury and wound healing may be analyzed.

With the background of the increasing knowledge of molecular and cellular mechanisms of disease evaluated *in vitro*, the technique of intravital microscospy ideally allows to bridge over from *in vitro* observations to test their potential relevance *in vivo*. Especially the Sidestream Dark-Field Imaging method provides the tools for translational research from the bench to the bedside for a variety of organs – as was pointed out very recently in a review from Christian Lehmann.

This book summarizes the state-of-the-art of intravital microscopy in different areas of biomedical sciences such as cell biology, immunology, neuroscience, stem cells and tumor biology. It includes the up-to-date experimental techniques but gives also examples of experimental and clinical studies thus making it a valuable compendium for scientists working in the field of microcirculation.

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