

The fibroblast growth factor (FGF) family of ligands and the corresponding family of FGF receptor tyrosine kinases comprise one of the most versatile and diverse growth factor signaling families. Found in virtually in every tissue and cell type, FGFs regulate numerous metabolic and physiologic processes, maintain cellular homeostasis, and mediate injury response, tissue repair, and regeneration. Abnormalities in FGF signaling can lead to a variety of diseases from developmental malformations, to atherosclerosis, pulmonary hypertension and cancer among many others. A thorough understanding of this system is necessary for critical insights into both normal and disease biology and is essential to development of rationale therapeutic strategies aimed at treatment of FGF-dependent diseases states.

Recent years have seen major advances in our understanding of FGFs role in endothelial and, more general, vascular biology, the subject of this book. In particular, FGFs have been implicated in the maintenance of vascular homeostasis and control of blood vessel permeability while aberrant FGF signaling has been shown to be central to the development of pulmonary hypertension, and endothelial-to-mesenchymal transition, a process central to the development of atherosclerosis and a number of other illnesses. Finally, FGFs ability to stimulate blood vessel growth has been explored in therapeutic angiogenesis and anti-angiogenesis approaches.

With this in mind, the present monograph is structured to provide a comprehensive overview of the FGF field to a reader interested in FGFs in general and vascular biology in particular. To this end, we explore everything from the structure and signaling of FGFs and their receptors to their role in the regulation of vascular homeostasis and cardiovascular diseases. We then address new developments in FGF therapeutics and explore FGF biology in the epithelium thereby providing a complete analysis of this growth factor family biology in two closely related but distinctly different environments- endothelium and epithelium. Finally, we examine FGF biology in eye disease and in cancer.

It is our hope that this comprehensive treatment of FGF vascular biology and its application will provide the reader with an accurate and timely summary of this rapidly moving field.

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