Pathophysiology of Organ and Tissue Fibrosis

Editorial

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Organ fibrosis is a common pathological outcome of several etiological conditions resulting in chronic tissue injury and is usually defined as an excessive deposition of extracellular matrix (ECM) components, leading with the time to scar tissue formation and eventually organ dysfunction and failure. The progressive architectural remodeling (i.e. fibrogenic progression) can be seen in nearly all tissues and organs and is recognized as a leading cause of morbidity and mortality worldwide. In addition, organ fibrosis is also emerged in recent years as critical for the development and treatment of malignant tumors, due to the significant impact of this process on carcinogenesis, invasiveness and metastasis as well as drug delivery to tumor masses. Despite the impressive amount of pre-clinical studies performed in the last decades using animal (mostly murine) models and the overall fibrosis-related high mortality and morbidity reported in humans, we still essentially lack validated effective anti-fibrotic therapies to meet the specific clinical needs.

The present special issue is then an attempt to provide readers with up-to-date information in order to cover an area of research that has grown steadily in the past two decades providing major advances in our knowledge on key events, mechanisms and clinical issues underlying fibrogenic progression in a defined organ.

In the first review of this issue Ralf Weiskirchen, Sabine Weiskirchen and Frank Tacke provide an introductory overview on major and common (i.e., organ-independent) basic mechanisms, mediators and signaling pathways, cells and processes involved in organ/tissue fibrosis, also including the principles of fibrosis reversal/resolution and general issues concerning diagnosis and staging of fibrosis. The following reviews in the issue are then dedicated to fibrosis in selected organs in which fibrogenic progression towards architectural remodeling and organ dysfunction is known to have a major worldwide health impact on general population, including kidney fibrosis (by Sonia Djudjaj and Peter Boor), liver fibrosis (by Maurizio Parola and Massimo Pinzani), lung fibrosis (by Diptiman Chanda and coworkers), cardiac fibrosis (by Nikolaos G. Frangogiannis) and intestinal fibrosis (by Antonio Di Sabatino). In these organ-oriented reviews, Authors have focused their contribution on peculiar and/or emerging pathophysiological issues for the specific organ, particularly in terms of etiological causes, morphological patterns of fibrosis as well as of cells, mechanisms and signalling pathways involved. In addition, Authors have also provided information on recently emerged pathogenetic targets and relevant clinical issues, including clinical window(s) for treatment and biomarkers for the assessment of disease progression and regression.

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