

Preface

Mesenchymal stem cells (MSC) represent one of the most interesting progenitors to date, due to their biodiverse functionalities. Among the fascinating multiple properties of MSC are their supportive roles in wound healing and in the regeneration of damaged tissues and organs. This implies the capacity of MSC to migrate towards injured tissue, to undergo differentiation, to modulate the activation of immune cells and to activate endothelial cells contributing to both angiogenesis and neo-vascularisation. Together with their self-renewal capability, the maintenance of stem cell homeostasis, the release of several bioactive compounds like chemokines, cytokines, micro RNAs and exosomes, MSC can be certainly considered as cellular all-round supporters.

These multi-functional MSC properties are highlighted in the present volume. While some chapters are focused on differentiation capacities of MSC, even beyond the more consolidated mesodermal lineages, others provide novel insights into the stimulatory signals involved in MSC survival and trafficking. Moreover, the MSC role in regulating cancer progression for novel therapeutics is assessed. In-depth molecular analyses of MSC functions are also covered, additionally including initial characterisations of distinct proteomic patterns that are specific for discrete MSC populations. Technical aspects for the isolation and enrichment of selected MSC populations are here additionally addressed in relationship to new cell sources and in the attempt to open new therapeutic platforms for potential clinical applications.

Although MSC research is progressively bridging to more consolidated clinical applications, it still represents a dynamically developing field, where a variety of intriguing aspects remain to be addressed. We feel this volume represents a comprehensive summary gathering a panel of up-to-date articles which combine the diverse MSC biological functionalities and their potential in translational cell therapy, as highlighted from different angles with a broad interdisciplinary perspective.

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