
Preface

Mesenchymal stem cells (marrow-derived stromal cells – MSC) were first harvested from the marrow well over two decades ago and were shown to likely play diverse functions in vitro and in vivo. MSC are thought to contribute to the stem cell niche in the marrow; contribute to smooth muscle, adipocyte, bone and cartilage development and repair; and in general contribute to the parenchyma of the most tissues and organs. MSC or MSC-like cells can therefore be isolated from a variety of tissues, and while subtle differences between these populations have been identified, their properties seem similar and different researchers have used different subpopulations of MSC and tested their efficacy in a variety of diverse models of disease.

This (MSC) class of somatic (adult) stem cells has seen an unprecedented level of interest in the last decade. They are the only stem cell type that has two annual meetings devoted solely to it and the only cell type that has spawned over a dozen companies and whose therapeutic efficacy is being tested in over 90 clinical trials. Perhaps the reason for this level of activity is the relative ease of isolation, the large numbers of cells present in the adult, and the ability to propagate these cells in culture (in contrast to hematopoietic stem cells or cord blood-derived hematopoietic stem cells).

Surprisingly, despite this level of activity, there is little consensus on the exact lineage of this population of cells and which set of markers defines these cells in vitro and in vivo. Given this ambiguity, we felt there was a need to compile a set of protocols and assays used by the leading investigators in this field that would enable others to standardize the population of cells they used in their experiments.

The end result of this effort is 35 chapters from leading experts from all over the world who have graciously shared their experience to describe how to isolate, propagate, characterize, and manipulate this special cell type. We hope the researchers will find the information in this book as useful as we and our laboratory groups have found it to be.

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