

# Preface

The concept of cancer stem cell (CSC) is a topic and very attractive field in cancer biology due to its possible broad impact onto cancer treatment options and diagnostic procedures. Although the theoretical explanations of cancer stem cell involvement in leukemia and solid cancers are still full of controversies with two leading theories (hierarchical and stochastic/cancer stem cell model) being investigated and checked, there is less and less doubts that such an entity as cancer stem cell does exist within otherwise heterogeneous cancer cell population.

Inspired 150 years ago by the famous German scientist Rudolph Virchow (1863), the development of novel approaches involving bioengineering solutions into both the diagnostics and the treatment is of critical importance today. The methods for isolation, determination of critical markers for particular cancers, and confirmation of functionality/tumorigenicity are developed in the meanwhile. The features of cancer stem cells are now compared to those of normal stem cells and the differences and similarities, investigated. The book will deal with novel methodology for: cancer stem cell marker identification, purification of CSCs, and operation of critical metabolic pathways in cancer stem cells, their genetic and epigenetic mechanisms emphasizing DNA methylation. The concept of targeted cancer stem cell therapy will be revealed from diagnostic, prognostic, and curative aspects. The ultimate goal of the book is to help the starters in this field to find the most critical information at one place and condensed, reliable source of references for intended research, as well as to get informed with the newest concepts and approaches linked to this topic.

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