

Human pluripotent stem cells**Methods and protocols**

Philip H. Schwartz and Robin L.

Wesselschmidt (eds)

Methods in molecular biology; vol. 767, 2011**Humana Press – Springer Verlag, Heidelberg****ISBN: 978-1-61779-200-7****Pages: 487; Figures: 89; €109,95**

The reader will immediately get the feeling, from the preface of the book, of handling a laboratory manual where no one needed information is missing: the preface itself is a chapter dealing with the historical reconstruction of the paradigmatic breakthroughs occurred in the last few decades in the stem cell world. I appreciated so much this aspect, a preface telling the students of the major achievements and from which prior scientific bases the new discoveries have been fueled, and giving the references of the most relevant papers published! Prof. Philip H. Schwartz (Center for neuroscience and translational research, Children's hospital of Orange County research institute, Orange, CA) and Robin L. Wesselschmidt (Beckman research institute, City of Hope, Duarte, CA) sketch out in a brief and well written preface their overview of the human pluripotent stem cells world, paying a fitting tribute to the previous mouse achievements and telling the reader how they conceived the book structure. Which architecture appear very well designed. The volume is a compilation of 33 detailed protocols divided in six parts, logically following one another from the laboratory essentials (design, equipment, stem cells banking, *etc.*) in part one, through part two devoted to illustrate protocols for the derivation of stem cells (five chapters, dealing with the derivation from both embryos and the use of retrotransfection of stemness genes to induce terminally differentiated cells to become pluripotent; not forgetting the use of *piggyBac* transposones to avoid the risks of retrotransfection) and part three presenting

the growth, maintenance and expansion of stem cells. Quite interesting the attention payed to illustrate how to culture human pluripotent stem cells in xeno-free media in order to match the cell factory's requirement for good manufactural practices to produce the cells needed for therapeutic applications. Once produced the desired cells must be characterized (part four), a procedure that can be accomplished thanks to several protocols (hopefully by the use of many of them) spanning from the classical karyotyping, FISH, flow and immunocytochemical techniques to the use of microarray technology to profile gene expressions and the epigenome to the most advanced quantitative proteomic analysis of human pluripotent stem cells. Eventhough the present day use of human pluripotent stem cells is still related to the 1998 J.A. Thomson statement that *these cell lines should be useful in studying human developmental biology, drug discovery and transplantation medicine*, a great hope is that to be able to use them for regenerative medicine through cellular therapies, to meet intractable diseases. To reach this goal a necessary prerequisite is the genetic manipulation (part five) of these cells to target specific gene expression or, viceversa, to get episomal transgene expressions. The generation of specific cell types (part six) useful for the possible treatment of several diseases (apart the hematological ones which have a long tradition of cures based on multipotent stem cells) is highlighted considering those diseases that seems much more at the hand: Parkinson disease and the treatment of the necrotic tissue due to infarction.

All the protocols are superbly illustrated with many figures and charts presented in full colours. I think this book is a must for all those are working with human pluripotent stem cells, no matter if students entering the field or colleagues already involved, each of them will get the chance to sharpen their conceptual insights.

CarloAlberto Redi
University of Pavia