Stem Cells & Regenerative Medicine
From molecular embryology to tissue engineering
Krishnarao Appasani and Raghu K. Appasani (eds.), 2011
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Maria J. Barrero and Juan Carlos Izpisua Belmonte sign a very interesting paper on EMBO reports (Regenerating the epigenome, EMBO reports 12:208-215, 2011) where they point out that *Organisms have evolved two strategies by which to achieve this: the maintenance of adult stem cells and the induction of stemcell properties in differentiated cells. In both cases, cells must undergo extensive epigenetic reprogramming to attain the specialized functions of the new tissue. Ultimately, the regenerative capacity of a tissue might depend on the plasticity of the cellular epigenome, which determines the ability of the cell to respond to injuryrelated signals. Understanding this epigenetic plasticity will allow the development of strategies to stimulate the regeneration of damaged tissues and organs in humans.*

Well, I think that there cannot be a better introduction to the topics treated in Stem cells and regenerative medicine: *From molecular embriology to tissue engineering,* edited by Krishnarao Appasani and Raghu Appasani for the Humana press, 627 pages for 36 chapters, full of detailed description of the stem cell word(s). The *Introduction* by the two editors is clearly telling the aim of such a *bible*, to cover from the basic aspects of molecular embriology dealing with the stemness cellular capacity (delightfully highlighted by Sir John Gurdon in a remarkably clear, as in his own style, preface) till the new challenging opportunities of tissue engineering. I think the price of the book (€170) is worthy enough for what the reader will get.

To make brief a review, which could be as long as the book itself, I would just recall some of the interesting points I faced. The first has to deal with the noisily repeated concerns on the safe of regenerative medicine by the use of stem cells: well written has only Sir Gurdon can do, I quote his sentence from page XII: *…I submit that a situation might be reached where, even though one patient may suffer, more than 99.9% of other patients may derive enormous benefit.* That's it.

As for the technical part: finally a book with all the figures in colour; this is a great help while looking at cytology, histology or entangled graphs! There are six partitions, the first dealing with basic stem cell biology, the second with the epigenetic and microRNA regulation of stemnees, the third with the therapeutic applications (notewhorty, diabetes, heart attack and Huntington desease among others). Part fourth deals more properly with stem cell research and is undoubtely tied with the Barrero and Belmonte paper: nuclear reprogramming and induction of pluripotency are practically and theoretically treated; unthinkable till few years ago, we can now get cellular reprogramming by just one of the four fabolous factors used by Yamanaka: the story is told us by the father of this factor, Hans Scholer with his OCT4! Tissue engineering is the theme of the fifth section with the intriguing relationships existing between the biomaterials we use to growth stem cells and their capacy to develop and to differentiate. Biophysics has still a lot to say us, three-dimensional coltures, lab-on-a-Chip tecnologies for stem cell coltures, etc. etc. The final part is devoted to regenerative medicine in urology (where great succes have been achieved), myology and cardiac desease. The very final chapter is devoted to cord blood banking (collecting, processing, etc.). I consider this topic of extreme relevance in a *science and society* context.

There is such a hot debate on the ethics of embryo-derived stem cells that the opponents (catholic Church) of this last type of stem cells (just for research uses) should give more and more help in addressing the society to collect such a treasure that in nearly 80-85% of cases is just destroyed and not harvested. When it is, the great majority goes to private companies for a conjectural autologous use, which is actually a very non-sense in the perspective of having a univeral bank devoted to those really need these cells irrespective of gender, race, credit-card holders! David Harris well wrote this chapter.

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