

## CELL TRANSPLANTATION-REVIEW

The review entitled “Current applications of human pluripotent stem cells: possibilities and challenges” by Pai-Jiun *et al* attempted to compile information about human pluripotent stem cells (hPSC) and their therapeutic potential, different sources and current applications. In the first section, Pai-Jiun and coworkers provide a brief introduction to the topic. They describe the different types of stem cells according to their differentiation capacity (i.e. totipotent, pluripotent, multipotent, oligopotent and monopotent). The second section provided information on the type of endogenously derived hPSCs. Here the authors described the general features, possible side effects and disadvantages of embryonic carcinoma cells, embryonic germ cells and embryonic stem cells (ESC). In the third section, the authors provided an interesting array of applications for human ESCs (hESCs). They spoke about applications in neural regeneration, cardiovascular repair, hepatic regeneration, treatment for diabetes, and cancer therapy. They also discussed hESC’s capacity to differentiate into mesenchymal stem cells and produce hematopoietic cells. Aside from this, authors addressed the role of hESCs in the field of drug discovery and toxicity testing. In the fourth part of the review, Pai-Jiun and coworkers deal with alternative sources of PSCs. In this case they speak about the possibility of reprogramming somatic cells to generate induced PSCs (iPSCs). They also address the major challenges for the therapeutic use of iPSCs. Finally, a small section is directed towards describing the main problems that are to be overcome before hESCs and iPSCs can be used for clinical applications.

The review compiles a good number of important publications on the topic. In general, the manuscript is well written and addresses the issues that could be of relevance to the theme. Nonetheless, I consider that the review must be improved as to achieve the quality required for it to be published. Some major and minor issues are disclosed below.

### Major issues:

1. One of the relevant concerns about the use of embryonic cells is the formation of tumors. The authors of the present manuscript speak quite superficially about this issue. It is desirable to include more information and references on this matter. There are several studies reporting on this issue (i.e. *Methods Mol Biol* 2006; 329: 459-467).

2. In page 9 Pai-Jiun and co-workers address the usefulness of hESCs on neural regeneration. They mention that hESCs have been used as a therapeutic approach in models of spinal cord injury, stroke, Parkinson disease, Alzheimer disease and Amyotrophic lateral sclerosis. Nevertheless, the authors only provide clear information on spinal cord injury. Despite the fact that references for the other pathologies are included, it could be more relevant to provide more information on the findings of these other neurodegenerative diseases.

3. A very recent review (Teo AK, Vallier L. *Biochem J.* 2010 Apr 28;428(1):11-23) addresses the topic in a very similar way; therefore, the authors must provide (in their response and in the review) the novelties and advantages of their work compared to that of Teo AK.

4. The abstract appears to be truncated at line 35. Please verify, if not, check redaction.

Minor issues:

1. The manuscript presents some typographical, spelling and grammar errors, which make some sentences difficult to understand. For instance:

- a) Page 4, line 45: focus in on PSCs.....
- b) Page 9, line 29: by many investigator....
- c) Page 21, line 29: Major challenges fro therapeutic.....
- d) Page 24, line 23: This phenomenon is apparently is not seen as often in ....

#### COMMENTS TO THE EDITOR

The present review is well written and compiles relevant information about the topic; however, my biggest concern deals with the novelty of the review. A previous publication appears to address the same topic in a quite similar way. I suggest that before the manuscript is accepted, the authors must convincingly respond to the major issue No.3. I recommend a new revision.