"The stem cell fashion": do we need only stem cells for tissue regeneration?

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Clinical Oral Investigations
https://doi.org/10.1007/s00784-017-2316-7

LETTER TO THE EDITOR

"The stem cell fashion": do we need only stem cells for tissue regeneration?

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Received: 12 December 2017 / Accepted: 12 December 2017

Dear Editor of Clinical Oral Investigations,

As reviewer, reader, and editor, I noticed a significant number of manuscripts published in several dental journals using mixed pulp cell populations but still referring to these as stem cells. The major part of these manuscripts is related to investigating the potential role of these mixed cells in tissue regeneration.

A quick look at the definition of stem cells clearly indicates that they are resting cells that can be activated by locally synthesized regeneration signals under pathological conditions and injury [1]. Recent data have shown that, when injured, pulp fibroblasts produce a significant number of biologically active molecules [2, 3] acting on neo-angiogenesis [4, 5], nerve growth [6], stem cell recruitment, and differentiation [7, 8].

After stem cell sorting with specific markers, studies performed in vitro showed that they are heterogeneous with regard to their differentiation potential and that culture conditions determine their differentiation fate [9]. However, transplantation experiments in vivo showed the significant contribution of the surrounding tissue on their differentiation and demonstrated that the local environment provides the required regeneration signals. This is well demonstrated by the fact that pulp stem cell transplantation into an ischemic site leads to endothelial cell differentiation and angiogenesis [9] while bone regeneration is obtained when they are transplanted into a bone defect [10].

Thus, while isolated and sorted stem cells should be used in studies such as cell fate determination, regeneration potential, and stem cell recruitment, there is "no shame" in using "mixed populations" of pulp cells for pulp regeneration studies pending that the authors specify the type of cells used. Indeed, stem cells cannot be engaged in tissue regeneration without the required regeneration signals of the surrounding microenvironment.

Thus, I believe, it is the responsibility of the authors to be precise on which cell population they use in their investigations and it is also the reviewers' and editors' responsibility to check for the appropriate terms employed related to the cells used in the experimental procedures. This is important for the young investigators to better understand what we are doing in the tissue regeneration research field.

Funding information The original works related to this subject and performed in our laboratory was supported by institutional funding from Aix Marseille Université and Centre National de la Recherche Scientifique.

Compliance with ethical standards

Conflict of interest The author declares that he has no conflict of interest.

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Published online: 20 December 2017

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