



Editorial

Cardiovascular stem cells revisited

In 2008, JMCC published a special issue on cardiovascular stem cells. A series of review articles written by experts in the field of stem cells highlighted the promise of cell therapy for future treatment of cardiovascular diseases and attracted considerable interest. Encouraged by this success, we decided to publish a follow-up issue. The rationale for revisiting cardiovascular stem cells was to cover topics that were not previously included, but also to acknowledge the fact that cell therapy is an area of ongoing controversy. Because of the high expectations and the substantial investments into stem cell research, we believe it is important to foster scientific debate. The point-counterpoint series already provides a dedicated format in JMCC to discuss controversies. Similarly, the special issues shall cover a broad spectrum of views.

It is obvious that the scientific community is divided about the therapeutic potential of certain types of stem cells for cardiovascular repair. By now, findings from different groups have refuted previous claims that the widely used culture assays for endothelial progenitor cells result in an outgrowth of genuine progenitor cells. The clinical relevance of this debate becomes apparent if one considers that results based on these assays partially motivated the use of unpurified bone marrow cells in clinical trials. Originally, it was suggested that bone marrow hematopoietic stem cells had the capacity to differentiate into cardiomyocytes and vascular cell types. However, the engraftment of bone marrow cells was poor and the pendulum was swinging to indirect effects on angiogenesis and functional regeneration of the heart. In hindsight, it is apparent that the controls for some key experiments were inadequate and that cell based therapeutic interventions moved rapidly if not prematurely from the benchtop to the bedside. New criteria for the assessment of adult progenitor cells are needed to avoid similar misinterpretations in future and previous publications have to be re-examined in the light of recent findings. In animal models of vascular injury, for example, a bone marrow cell contribution was predominantly observed during the acute inflammatory phase. Analyses at later time points argued against a permanent incorporation of bone marrow-derived cells. Alternative concepts focus on resident cells in the endothelium, adventitia or epicardium. The special issue concludes with review articles covering the latest developments in tissue engineering and the application of induced pluripotent cells to cardiovascular disease.

Research evolves and builds on existing knowledge and understanding. Arguably, the drive for Journals to increase their impact factor can put a pressure on editors to publish the research, which is most likely to attract citations. Positive studies, which confirm our hopes, tend to prevail over the publication of negative findings, because they are less likely to cause a stir among the scientific community. On the other hand, scientific advances often result from challenging common assumptions. A more detailed knowledge of stem cell action in tissue repair and regeneration is essential to overcome the hurdles and face the challenges of cell therapy. At least, the recent progress and failures in clinical stem cell trials have stimulated a renewed interest in cardiovascular development and differentiation, but it remains to be elucidated whether we have cardiovascular stem cells that circulate and/or reside in the tissue, secrete paracrine and autocrine factors, or contribute to cardiovascular repair by differentiation.

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