Reviewer's report

Title: Different culture media affect growth characteristics, surface marker distribution and chondrogenic differentiation of human bone marrow-derived mesenchymal stromal cells

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Reviewer: Richard Schaefer

Reviewer's report:

In their manuscript "Different culture media affect growth characteristics, surface marker distribution and chondrogenic differentiation of human bone marrow-derived mesenchymal stromal cells" the authors report on their analyses of human BM-MSCs cultured in 4 different media.

From a translational perspective, this work could be considered as a valuable contribution to the production of BM-MSC preparations.

Minor Essential Revisions:

1. In the current version of the manuscript, the policy of depicting the different media is not consistent (e.g. more scientific labels "DMEM-LG and "Alpha-MEM" are in contrast to the personal names "Verfaillie" and "Bernese"). The use of personal names for media formulations is, with all due respect for these colleagues, not favorable. It is suggested to re-name the media e.g. by medium A, medium B, etc. or to use other more scientific labels (e.g. by creating applicable acronyms based on the media components).

2. Figure 1 is problematic:
   First: the presentation of significant differences is confusing (the current bars are not very helpful) – it is strongly suggested to re-design this figure to clearly show which groups are significantly different compared to others and to re-check the statistics.
   Second: it appears that stars indicating significance(s) are missing (Fig. 1c).
   Third: In the “Results” section (p.11) the authors state “Mean MSC yield per 10E3 BM-MNCs at P0 was highest in Verfaillie, compared to the other media, and lowest in DMEM-LG…” – it is unclear if this refers to all other media as no star/bar indicates a significant difference to the “Bernese” medium in Fig.1.

3. Flow cytometry:
   It is unclear if the authors refer to % positive cells compared to isotype control or to mean fluorescence intensity (MFI) compared to isotype control.
   It is also suggested to show exemplary histograms for all targets.

4. Adipogenic differentiation potential: The pictures show very poor results of the
adipogenic in vitro differentiation assays (Oil Red O staining) – was this the case for all tested BM-MSC preparations? It would be good if the authors could address this issue in the Discussion.

Why are the data of the quantitative analyses of the in vitro differentiation assays not shown?

5. Methods:
It is suggested to report the gender distribution of the BM donors and to specify how many BM samples were taken from each of the localizations (tibia, femur, iliac crest). Maybe a table would be a good way to present these donor/sample specifications.

It is assumed that each BM-MNC preparation was (after Ficoll) divided into four samples of identical volume/cell number and subsequently processed with the different media(?) If yes, it would be helpful if the authors could clarify.

6. Discussion:
The authors state (and reiterate) that their study report for the first time on quantitative analysis of surface markers on human BM-MSCs cultured in different media.

Referring to the following studies, this statement should be verified:

Fekete N et al. Platelet lysate from whole blood-derived pooled platelet concentrates and apheresis-derived platelet concentrates for the isolation and expansion of human bone marrow mesenchymal stromal cells: production process, content and identification of active components. Cytotherapy, 2012; 14: 540–554


It is suggested that the authors check these papers carefully and put their findings into context of these (in the discussion). Rephrasing of the aforementioned statement might be favorable.

7. Check the text carefully for redundant passages (e.g. p 4: “The term mesenchymal stem cell...”

As basic MSC features were outlined in the first 2 paragraphs before in the “Background” section, it is suggested to delete “The term..” incl. “, but further” and start a new sentence with “Minimal criteria...”).

p. 5: “It has become evident that BM-MSCs are a more heterogenic...”

8. Check carefully and correct the use of the German comma (instead of the English point) e.g. p.7: “5 ml BSA 7,5%” etc...

9. Define “GAG (p. 8)
Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.