The manuscript undertakes a comprehensive review of diverse biomarkers linked to hair follicle stem cells (HFSCs), encompassing elucidations on their expression patterns and regulatory roles. However, the present iteration falls short of recommendation for acceptance. To elevate the overall quality of the manuscript, careful attention must be directed to the following key points:

1. Consider supplementing the detailed description of biomarker expression periods and locations with visual aids, such as figures or diagrams. These graphical representations can significantly augment reader comprehension by illustrating the diverse stages of hair follicle development and the roles played by various cell types.

Response: Thank you for your suggestions. We fully agree with you, thus we added a figure illustrating the hair cycle and the roles played by some critical cell types in the revised manuscript.

2. Address formatting issues throughout the manuscript, including problems with reference format (line 52) and inconsistent punctuation formatting (lines 61, 89, 90, 91, etc.). Ensure meticulous adherence to the chosen citation style and maintain consistent formatting throughout the manuscript.

Response: Thank you for pointing out the format problems. We edited the reference styles using Endnote. The citation styles are consistent now.

3. Rectify the non-uniform format of subtitles, ensuring consistency, and include the full name of the gene in all relevant cases for improved clarity.

Response: We revised the subtitles to ensure consistency, and added the omitted full name of some genes.

4. Expand the discussion on future research directions within the field. Offer more detailed suggestions on addressing identified limitations in subsequent studies, elucidating the path for future investigations.

Response: Thank you for your suggestions. The key limitation is the markers are partly overlapping, thus many subpopulations of HFSCs exist in the bulge. Future investigations should focus on this area. We added some limitations of previous studies and suggested the path for future investigations in the second paragraph of the Discussion section in the revised manuscript.

5. Delve into how the studies under review stimulate authors to pursue further research. Identify lingering questions, propose experiments or investigations prompted by the findings, and underscore any unexplored aspects.

Response: Thank you for your suggestions. We emphasized the clinical relevance of HFSCs to add the meaning of the review. We also proposed some future research areas such as space transcriptomics in the revised manuscript. The revisions can be found in

6. Explicitly outline the limitations of the reviewed studies and highlight potential biases introduced by specific methodologies. This transparency will contribute to a more robust and balanced interpretation of the findings.

Response: Thank you for your suggestions. HFSC markers were revealed by classical methods. In recent years, the use of scRNA-seq brought new chances for revealing HFSC markers. However, scRNA-seq also has some limitations. For example, the study was not able to distinguish previously reported cell populations containing certain specific markers, such as Gli1+ or Lgr5+ cells in the lower bulge. We discussed this in the Discussion section.

7. Integrate a stronger emphasis on the clinical relevance of the reviewed studies. Discuss how these findings might impact future clinical approaches or therapies, providing a bridge between basic research and potential applications in a clinical setting.

Response: Thank you for your suggestions. We emphasized the clinical relevance of HFSCs to attract the attention of general readers in the first paragraph of the revised manuscript.

By addressing these points, the manuscript will not only strengthen its scientific rigor but also enhance its accessibility and potential impact within the scientific community. We appreciate the authors' valuable contribution to the field and look forward to a revised version that incorporates these suggestions.

Response: We appreciate your high evaluation. We revised the manuscript accordingly.