

Response to Reviewers

Reviewer #1:

The manuscript provides a thorough and insightful overview of the potential applications of mesenchymal stem cells in treating premature ovarian insufficiency. The introduction provides a clear overview of the current understanding of POI, highlighting its diverse impact on various aspects of health and the limitations of existing treatment strategies. The manuscript effectively moves to the main topic of MSCs by categorizing them according to their sources and examining the specific contributions of MSCs from bone marrow, adipose tissue, umbilical cord, and menstrual blood in relation to POI. The manuscript provides an overview of current research on MSCs in treating POI. It is well-organized, with clear headings and subheadings that make it easy to navigate and understand. The inclusion of clinical studies adds credibility to the review. The manuscript goes beyond summarizing clinical findings by addressing the possible mechanisms by which MSCs may affect ovarian function. This insight into mechanisms adds value to the discussion and increases the scientific rigor of the review. Suggestions for improvement: The manuscript would benefit from a more explicit discussion of the limitations and challenges associated with MSC-based therapies for POI. Addressing potential obstacles, ethical considerations, and unresolved issues in this area would provide a more nuanced perspective. As regenerative medicine is rapidly evolving, including information on recent advances or emerging trends in MSC research for POI would be beneficial. This would ensure that the review is up-to-date and reflects the latest developments in the field. Overall, the manuscript provides valuable insight into the potential use of MSCs in treating POI. Considering the suggested improvements will improve the overall quality and impact of the review.

Response: We sincerely appreciate your thorough and constructive feedback on our manuscript discussing the potential applications of mesenchymal stem cells (MSCs) in the treatment of premature ovarian insufficiency (POI). In order to enhance the manuscript's comprehensiveness, we have explicitly addressed the limitations,

challenges, and ethical considerations associated with MSC-based therapies for POI (see Lines 198-224 in the revised manuscript). Additionally, we have updated the manuscript by incorporating information on recent advances and emerging trends in MSC research for POI (see Lines 123-127, 148-151, 173-176, 181-183 in the revised manuscript). By doing so, we ensure that the review reflects the latest developments in regenerative medicine, thereby increasing its relevance and impact.

We are grateful for your recognition of the manuscript's value and have diligently considered and implemented your suggestions to improve its quality and impact. Your feedback has been invaluable in shaping the final version of the manuscript. Once again, we extend our sincere gratitude for your invaluable input and guidance.