

OPEN PEER REVIEW REPORT 1

Name of journal: Neural Regeneration Research

Manuscript NO: NRR-D-22-00464

Title: MELATONIN, TUNNELING NANOTUBES, MESENCHYMAL CELLS, AND TISSUE REGENERATION: Current perspective

Reviewer's Name: Pavel Montes de Oca Balderas

Reviewer's country: Mexico

COMMENTS TO AUTHORS

The manuscript entitled: "MELATONIN, TUNNELING NANOTUBES, MESENCHYMAL CELLS, AND TISSUE REGENERATION: Current perspective" briefly reviews how melatonin may help to improve the outcome of MSC transfer to treat some diseases, highlighting the role of the mitochondria. In opinion of this reviewer some issues listed below could be considered by the authors that may improve the manuscript:

1.- It could be convenient that a new paragraph is inserted at the beginning in which the main advantages and differences of MSC over/with other SC are briefly explained. For instance, why are MSC employed if they present some difficulties that apparently are not presented by other SC?

2.- The role of antioxidants in cell biology has been a matter of study for more than 30 years. Nevertheless, none is currently in use in the clinic, therefore posing doubts about their potential use and the models that have supported their benefits for cellular health. In this regard, has it been analysed the actual relevance of melatonin scavenging and antioxidant functions compared with its cell signalling effects contrasting them with a different scavenging and antioxidant molecule? If it is the case, it should be briefly explained in the text, if it is not the case that should also be stated in the text along with a short commentary on this regard.

3.- The transfer of plasma membrane molecules to mitochondria has been documented and mediates a form of plasma membrane-mitochondria communication. Are melatonin receptors or melatonin itself translocated to mitochondria? Could this mechanism be implicated in the cell protective functions of melatonin?

3.- The role of sirtuins is tackled in the conclusions section. Nevertheless, enough information and discussion is provided to conform a paragraph within the main text. The conclusion section should be focused solely in pinpointing the main relevant aspects from the information provided and the implications that stem from it.