

Response to Comments

On the Immunological Limitations of Hibernation and Synthetic Torpor as a Supporting Technique for Astronauts' Radioprotection in Deep Space Missions” by

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Dear Editors and Reviewers,

We sincerely thank you for the constructive comments. They have been of great value in improving our manuscript. We have given all comments substantial consideration and revised the paper accordingly. Here, we summarize our modification. Our point-by-point, detailed responses to each question/comment can be found in the following pages.

Comment No.	Comment	Response
R1-1	What do LPS, GCR, SPE, HZE etc. mean in the abstract and text as well?	The full forms of these acronyms are added to the manuscript .
R1-2	2. Can you explain more about synthetic torpor? Does it mean artificial hibernation? How is it achieved in deep space mission?	The following section is added to the manuscript: <i>“Given this consideration, synthetic torpor (i.e. artificially inducing regulated, depressed metabolic states) has been introduced as a method for safely and practically transporting experimental animals to deep space[1]. Studies show that some chemicals can induce hibernation-like state[2]. However, in case of humans, there are concerns regarding the intrinsic risks of the artificial hibernation (synthetic torpor) and other factors involved in this procedure[2]”.</i>
R1-3	3. The sentence “ We have previously noted that the limitations of physical and biological protection of astronauts against space radiation is a key issue that should be properly-----” is not correct, and the “is” should be replaced by “are”.	Per your suggestion, we replaced “is” by “are”: <i>“We have previously noted that the limitations of physical shielding and biological protection of astronauts against space radiation are among the key issues that should be properly addressed before a deep space mission is initiated [6-8]”.</i>
R1-4	4. Key words: Immunological effect or immunology should be added as another key word.	We added “Immunology” to the keywords.
R2	NA	Thank you very much!