

OPEN PEER REVIEW REPORT 1

Name of journal: Neural Regeneration Research

Manuscript NO: NRR-D-21-00340

Title: Guardians of the eye: new tales from the macrophage multiverse

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COMMENTS TO AUTHORS

The present manuscript gives an overview of the recent advances in the characterization of ocular myeloid cells. The scope is not directly related to neural regeneration but represents very important groundwork to help understanding ocular myeloid lineage in health and disease. The review is of great interest to the field of neuroimmunology and ocular immunology. The review especially focuses on the results of two pioneer publications (O'Koren et al., 2019 and Wieghofer et al., 2021), which evaluate the origin and fate of ocular myeloid cells using single-cell transcriptomics. Both studies were well executed, controlled, and presented.

Major comment:

The manuscript is being considered for a section named 'Perspectives'. In that regard, the manuscript seems to give more emphasis to the description of the results of the above-mentioned articles without sufficiently exploring the broader implications of such results. It would be interesting to know the authors' perspectives on some of the conclusions mentioned, as they have a solid body of work on neurodegenerative diseases. For instance, what may be, if any, the implications of:

- a. Strong transcriptional similarities between bMG and rMG (35, page 4), namely in the context of eye and brain inflammatory diseases;
- b. Similar myeloid clusters among neuroinflammatory diseases, despite divergent cytokine profiles and signaling (8-17, page 4).

The conclusions summarized in 8-12 page 5 could also be less generic and point out what may be the translational implications of such results to the field.

Minor comments:

1. The title could potentially be revised to inform better about the content of the manuscript;
2. In the conclusion, the authors briefly mention SPP1 as a potential target for AMD. Perhaps, this information could be extended to give more context to the readers.