

## OPEN PEER REVIEW REPORT 1

**Name of journal:** Neural Regeneration Research

**Manuscript NO:** NRR-D-20-00763

**Title:** Low-dose lipopolysaccharide as an immune regulator for homeostasis maintenance in the central nervous system through transformation to neuroprotective microglia

**Reviewer's Name:** Olga Kopach

**Reviewer's country:** UK

### COMMENTS TO AUTHORS

In this work, authors studied changes in the expression of various proteins involved in microtubule dynamics in spinal cord injury (SCI). There were identified a set of proteins up or downregulated in SCI and experimentally demonstrated the involvement of some identified proteins in neurite outgrowth using hippocampal primary neurons as a model. The work is technically sound showing some new and important findings. However, there is a large overinterpretation of the data, and the obtained results do not support conclusions on the SCI repair. What the authors demonstrate is that CRMP3 is downregulated in SCI, interacts with spastin protein and their interaction regulates neurite outgrowth in hippocampal neuronal cultures. These findings are important and to some degree novel by themselves, and authors have to keep the focus on actual experimental results instead of overinterpreting for a regulation of the SCI repair. Therefore,

- the paper must avoid speculating on "regulate the repair of spinal cord injury", starting from the paper title and throughout the text.
- It must be clear that neurite outgrowth had been tested in hippocampal neurons (in abstract and across other sections). Otherwise, authors have to show the effects of CRMP3 and spastin in the spinal cord tissue or spinal neuronal cultures to be able to extrapolate their data to SCI directly.
- In order to confirm the SCI model, it must be performed motor dysfunction assessment in the SCI-animals. Especially, in the context of categorizing between the light, moderate or severe levels of injury. Common immunostaining does not provide an understanding of severity regardless of the markers used.

Minor,

- Please specify the age of hippocampal neurons for the neurite assessment (the only information present for the time of transfections, at 2 DIV).
- Description of the obtained results on identified proteins (Fig. 5) are needed in more detail (not just a sentence of basic information).
- Check reference list for the repeated references.