Reviewer Report

Title: Proteomic landscape of the primary somatosensory cortex upon sensory deprivation

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Reviewer name: Alex Bayes

Reviewer Comments to Author:

The article from Kole and co-authors entitled 'Proteomic landscape of the primary somatosensory cortex upon sensory deprivation' describes a layer-and-column specific proteomic profiling of the barrel cortex with the goal to elucidate the molecular mechanisms involved in experience-dependant plasticity affecting neural circuits. This article addresses a key need in the field of brain proteomics, which is the analysis of microscopic and functionally isolated brain regions, to ultimately cope with the high level of brain cellular and molecular complexity. The authors have done a very exhaustive work to show that they are able to successfully apply mass-spectrometry based methods to investigate microscopic brain regions, obtaining sample protein coverage comparable to present day proteomics standards and high reproducibility between biological and technical replicas. From a technical perspective this is thus an important contribution to the field. The absence of biological data (which is not required for Data Note Articles) does not allow clarifying if this work will also represent an important biological contribution.Nevertheless, several issues should be addressed prior to publication:Major points1. It is my understanding that the dissection method used to isolate L4 from L2/3 in a column-specific manner is quite new. The authors should better describe how they do it, or give appropriate references. Particularly relevant would be to explain how do they make sure that they can collect L4 separately from L2/3.2. Could the authors get 3 biological replicas for all samples? For instance in control L2/3 and L4, there are only 2 biological replicas, no? For other samples there seems to be 4 biological replicas (L4 2nd order), but only three female pups are said to be used for each group in this work. (?). The methods section should be re-written to accommodate all these discrepancies. Actually, extending the methods section to explain in more detail the samples gathered and analysed would help the reader. Similarly an extra panel could be added to figure 1 to show this in a clear and schematic manner.3. The authors briefly refer to the low level of protein contaminants (page 4 lane 51) found in their preparations. What do they refer to,wha tare contamiant proteins? Please further develop and give some figures. i.e. what is the fraction of contaminant proteins.Minor pointsHave the authors only used somatosensory column C for controls? If so please clarify in the text.Figure 1B last step, please change 'MS Analysis' by 'LC-MS analysis'.Page 6 lane 11 , change 'decently' for a more appropriate word.

Level of Interest

Please indicate how interesting you found the manuscript: An exceptional article

Quality of Written English

Please indicate the quality of language in the manuscript: Acceptable

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