**Schizophrenia Research**

*Title:* Targeting cognitive dysfunction in bipolar disorder: a review, by Bergeron et al.

*Overall:* The authors conducted a systematic review of the literature on pharmacological treatments and cognitive deficits in bipolar disorder. The idea is novel and the findings of this review have important clinical implications. However, the structure of the introduction needs to be revised, and interpretation and overall critical appraisal of the findings needs to be improved. Major revisions recommended.

1. I would recommend that the authors mention or at least briefly discuss possible biological mechanisms that may affect brain performance in mood disorders. If they mentioned for instance the role of neurotransmitters such as acetylcholine, glutamate, dopamine, and mechanisms associated with inflammation/stress response (e.g.HPA, glucocorticoidal response) in the brain or in the pathophysiology of mood disorders it would be easier for the reader to fully understand the importance of the findings. Also, given the nature of the bipolar disorder they could mention how mood, the bipolar subtype, education and IQ may affect cognition is essential.
2. I would highly recommend that the authors report the findings of their systematic review in a more consistent and “official” way: see *www.prisma-statement.org* and *Bauer et al. 2014, Inflammatory mediators of cognitive impairment in bipolar disorder. J Psychiatr Res. 2014 Sep;56:18-27.* A CONSORT flowchart should be included. A table reporting the main findings, demographics of the population, doses, duration of the treatment, design, list of cognitive assessments and clinical questionnaires etc. is necessary and would facilitate the understanding of the findings. The quality and reliability of the studies included in this review should be assessed and discussed.
3. A more critical thinking and in-depth understanding of the implications of what was found is required. For instance, at the end of each major section the authors could summarize the evidence, define the strengths and limitations of the findings and provide a conclusion on the efficacy of the treatment. This would improve the readability and understanding of the review. For instance, the authors report that galantamine was associated with a decrease in choline levels in the left hippocampus. One could mention the importance of the hippocampus in bipolar disorder, the role of choline in mood. also can the authors explain what they are referring to when they mention the “neuroprotective effects of galantamine” as this was not previously discussed in this manuscript.
4. Overall, the authors should also be precise in defining what an improvement (or lack) in cognitive functioning means. Are they referring to reaction times or accuracy of response? How to view an improvement in reaction time over an improvement in accuracy? They could refer to neuroimaging studies if needed. Since the review focuses on cognitive functioning it would also be good to define how tasks differed across studies.
5. Discussion and conclusions are too long: hence they could be merged and shortened by about half. A review does not require such a long discussion because findings should have been discussed within the results section. Although the authors’ comments in this section are all relevant it would also be relevant to mention 1. What kind of cognitive domains should be improved and are there domains that have not been thoroughly investigated 2. Self-rating questionnaires and objective measures of cognitive functioning. May treatments target biological mechanisms that are unrelated to cognitive functioning?