Review 2: "Gut Microbiota from Patients with COVID-19 Cause Alterations in Mice that Resemble Post-COVID Symptoms"

Luis Vitetta¹

¹The University of Sydney

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**Review:***

This preprint manuscript finds that the gut microbiota from patients with COVID-19 causes alterations in mice that resemble post-COVID symptoms. The authors show that intestinal dysbiosis was present in post-COVID patients. This was further supported by reduced levels of faecal SCFAs, a further marker for severe intestinal dysbiosis. Still, was there a deficit in abundance of other microbial genera in post COVID-19 patients irrespective of the small sample size?

The authors progress the notion that there was a direct connection between the long-term effects of COVID-19 with alterations in gut microbiota. This idea requires further clarification as there was no data presented on other microbial genera in the intestines showing a loss of abundance and diversity. The suggestion that the gut microbiota may be a therapeutic target should be further discussed given that the authors have investigated a *Bifidobacterium longum* effect on murine model recognition test. The gut lining and gut brain connections are mentioned in the discussion with loss of intestinal homeostasis and neuroinflammatory activity. It would be beneficial for this manuscript to further clarify how these observations are linked. Is it gut-to-brain signaling or brain-to-gut signaling that was observed and discussed, or was it both? Finally, the manuscript could use more clarity on the histopathology and immunohistochemistry methods.

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**RR:C19 Evidence Scale rating by reviewer:**

- **Reliable.** The main study claims are generally justified by its methods and data. The results and conclusions are likely to be similar to the hypothetical ideal study. There are some minor caveats or limitations, but they would/do not change the major claims of the study. The study provides sufficient strength of evidence on its own that its main claims should be considered actionable, with some room for future revision.

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