Reviewer's report

Title: Lactobacillus paracasei feeding improves the control of secondary experimental meningococcal infection in flu-infected mice

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Reviewer: Hazem Ghoneim

Reviewer's report:
The authors of the manuscript# NFD-D-18-00098 entitled "Lactobacillus paracasei feeding improves the control of secondary experimental meningococcal infection in flu-infected mice" investigated whether feeding mice with Lactobacillus paracasei as a probiotic treatment would improve the outcome of secondary meningococcal infection after primary influenza infection. They showed that the oral consumption of Lactobacillus increased the numbers of some inflammatory myeloid populations in the co-infected lungs with lower meningococcal load at 24 h post-infection. I have the following comments/questions for the authors:

1- Although the survival rate of the co-infected mice is slightly improved with Lactobacillus feeding on day 9 p.i, it seems to arise from better disease symptoms during primary influenza infection rather than the control of secondary meningococcal infection (Fig. 1). Does Lactobacillus feeding affect the clearance rate of meningococcal infection without primary influenza infection?

2- The authors suggested that the beneficial effect of this probiotic treatment might be related to enhanced function of alveolar macrophages. Although they gated for alveolar macrophages in the supplemental figure, they did not show any data on the numbers of alveolar macrophages in different treatment groups or assess their phagocytic function.

3- Previous studies have demonstrated that lung-resident alveolar macrophages are depleted during influenza infections breaking innate immune defense against bacterial superinfection. The authors need to discuss how probiotic treatment may modulate this defect in anti-bacterial immunity during influenza infection.

4- Several typo errors need to be checked, such as lines 138-139, 176, 219, 282, and 299.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.
No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.
No

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