

For research article

Response to Reviewer 2 Comments

1. Summary

Thank you very much for taking the time to review this manuscript. Please find the detailed responses below and the corresponding revisions/corrections highlighted/in track changes in the re-submitted files.

2. Questions for General Evaluation	Reviewer's Evaluation	Response and Revisions
Does the introduction provide sufficient background and include all relevant references?	Yes	—
Is the research design appropriate?	Yes	—
Are the methods adequately described?	Must be improved	Improved. Details are shown below.
Are the results clearly presented?	Can be improved	Improved. Details are shown below.
Are the conclusions supported by the results?	Can be improved	Improved. Details are shown below.

3. Point-by-point response to Comments and Suggestions for Authors

Comments 1:

2.1. Shrimp head hydrolysate preparation L86, Table A1 L466

Please add description about the content of lipids (especially carotenoids), and indigestible carbohydrate (such as glucosamine) in SHH.

Response 1:

Thank you for pointing this out. The lipids in SHH were removed during sample preparation. Most of SHH was amino acids, about 70%. Based on this, the carbohydrates content is relatively low. Further experiments are needed to determine the SHH composition.

Comments 2:

2.2. Animal treatment L95

Please describe mouse strain in more detail (C57BL/6J or N ?)

Response 2:

Thank you for pointing this out. The mouse strain is C57BL/6J. See line 97 for details.

Comments 3:

2.2. Animal treatment L107

Please describe gavage frequency (1 time / day?) and energy ratio of SHH to daily intake of food.

Response 3:

Thank you for pointing this out. Gavage frequency was once per day. See line 113. The amount of gavage is calculated based on body weight, which is a usual practice in animal experiments. Before each gavage, each mouse was weighed and the gavage amount was calculated. The diet of each group of mice was the same but ad-lib. So, the daily food intake amount was different. Therefore, the energy ratio of SHH to daily intake of food is generally not calculated.

Comments 4:

2.5. Gut microbiota measurements L144

Please describe the sequencing depth per sample.

Response 4:

Thank you for pointing this out. The sequencing depth per sample is described in Table A3 (Page19, line 549-552)

Comments 5:

Fig.8 L252

Please add symbols for $p < 0.01$ to the figure.

Response 5:

Thank you for pointing this out. The p values of 18 genera were < 0.01 . It now shown in the legend. (Page 9, line 310)

Comments 6:

Fig. 14 L330, Discussion L419

It is very interesting that the authors found clear correlation between fecal neurotransmitters and bacteria genera. If the authors perform correlational analysis among bacteria genera (e.g. Muribaculaceae vs. Bacteroides) and discuss their competitive or cooperative relationships mediated by nutrients (Trp, Asp, Tyr, Phe, and Glu), it may increase the value of manuscript.

Response 6:

Thank you for pointing this out. There is a clear correlation between fecal neurotransmitters and bacterial genera but not between neurotransmitters and behavioral indicators. There is no clear experimental data to support the competition or cooperation between microorganisms. However, in-depth exploration of this aspect would no doubt be useful research in the future.

Comments 7:

References 20 L517, 21 L519

It is not reader-friendly to refer Chinese journals in the manuscript submitted to international journal.

Response 7:

Thank you for pointing this out. The original reference 20 has been replaced with English references 27 – 30 (See lines 623 - 633 for details. The original reference 21 is a preliminary research finding of our group and has not been published in a foreign journal. Therefore, it has not been replaced.

4. Response to Comments on the Quality of English Language**Point 1:**

English language fine. No issues detected.

Response 1:

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5. Additional clarifications