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## Interleukin-34 as a positive regulator of intestinal barrier function for alleviating bacterial enteritis in *Megalobrama amblycephala*

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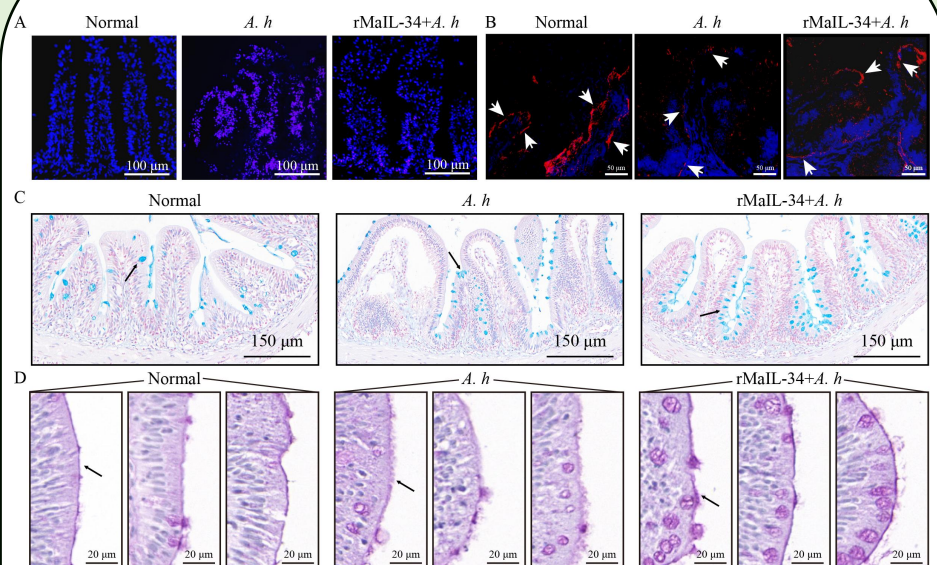
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### Abstract

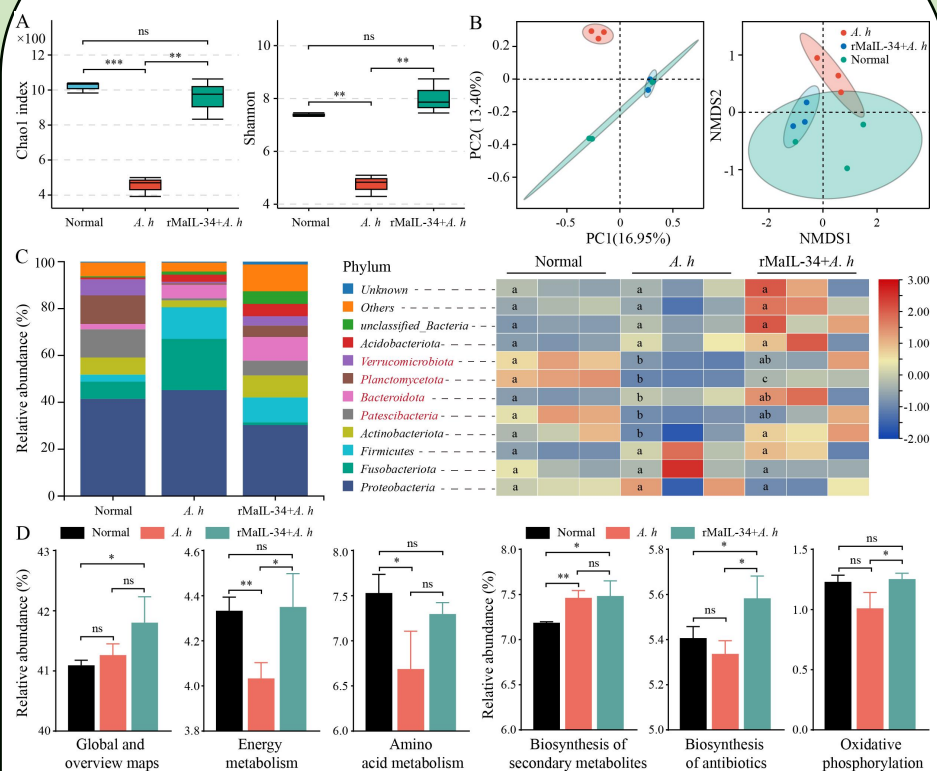
In vivo experiments revealed that recombinant *Megalobrama amblycephala* IL-34 (rMaIL-34) protein significantly mitigated intestinal damage caused by *A. hydrophila*. This mitigating effect may be due to that rMaIL-34 maintains the integrity of mucosal layer by inhibiting the Notch signaling, promoting goblet cell proliferation and mucins expression. Meanwhile, rMaIL-34 reduced *A. hydrophila* induced intestinal permeability and maintained the integrity of intestinal tight junctions. Furthermore, rMaIL-34 enhanced the resistance of *M. amblycephala* to bacterial infection by inhibiting the intestinal oxidative stress-apoptosis-inflammation cascade. On the microbiological level, rMaIL-34 enriched beneficial flora while decreasing harmful flora, and enhanced intestinal microbiota functionality in energy metabolism, antibiotic biosynthesis, and oxidative phosphorylation.

### rMaIL-34 enhanced the intestinal barrier



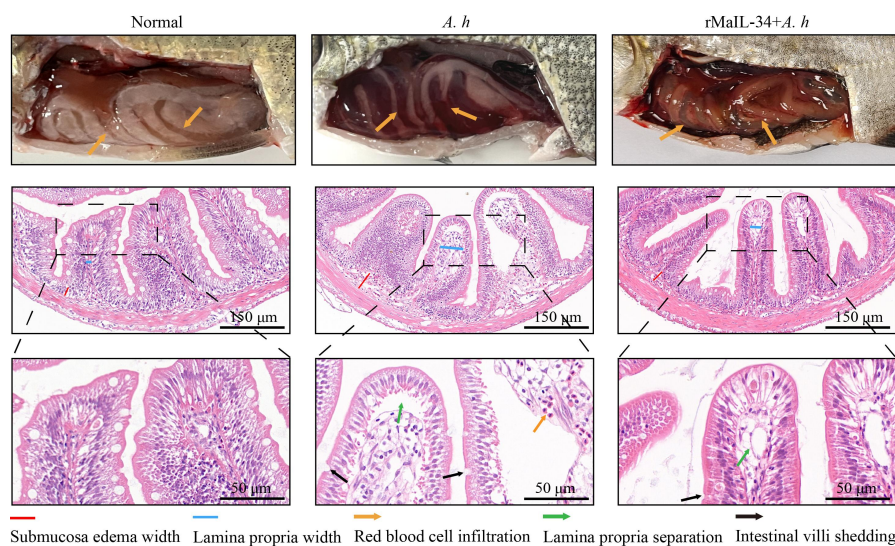
A: ROS staining; B: ZO-1 immunofluorescence staining; C: AB-PAS staining; D: PAS staining.

### rMaIL-34 enhanced intestinal flora function



A: Chao1 and Shannon diversity indices; B: PCA and NMDS indices; C: Relative abundance of intestinal microorganisms; D: Statistical analysis of the relative abundance.

### rMaIL-34 mitigated bacterial intestinal injury



Pathological injuries and HE staining from different groups.

### Conclusion

MaIL-34 may positively regulate the intestinal health and barrier function of *M. amblycephala* after *A. hydrophila* infection.