



Ginseng Polysaccharides Prevent Mastitis Through Lactobacillus murinus-Derived Deoxycholic Acid and TGR5 Signaling

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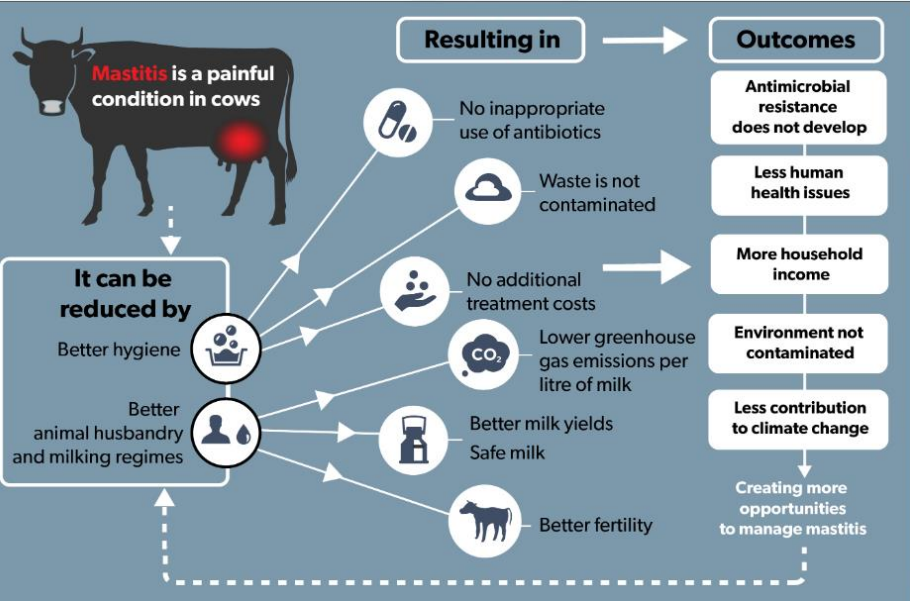
Zhijie Zheng, Huiying Liu, Sizhe Chen, Jianhui Gu, Sisi Cai, Xiang Liu, Raphaella I Lau, et al. 2026.

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Background



Mastitis is currently the leading disease affecting the development of the dairy industry

Decreased milk production

Decreased quality of fresh milk

Affects food safety

Wasting feed and increasing medication costs

Affects the production performance of dairy cows



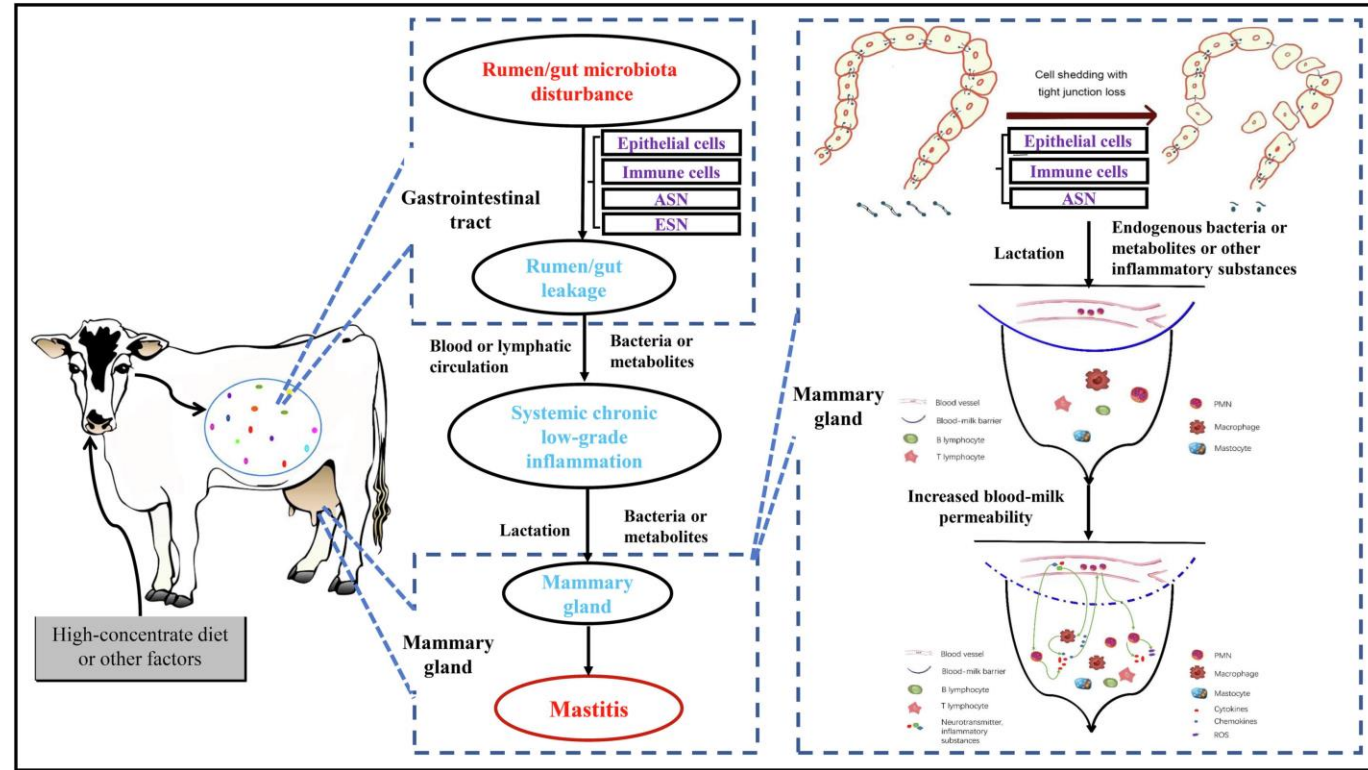
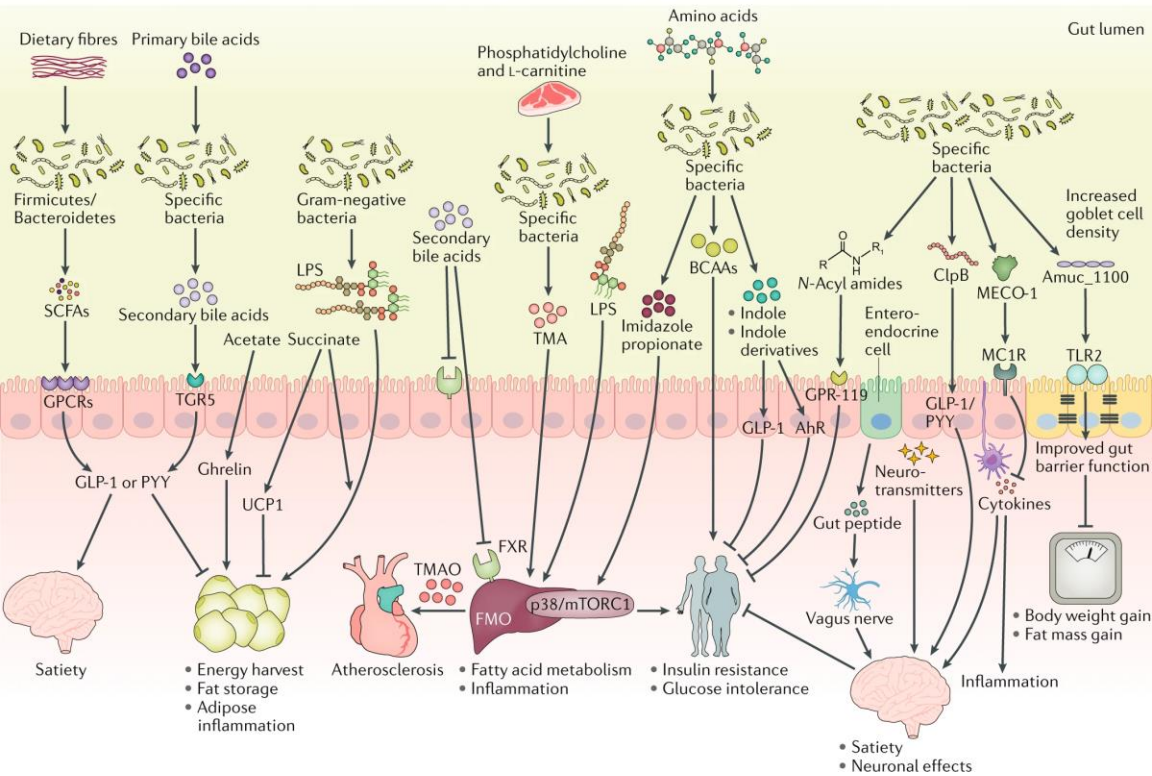
The annual economic losses caused by mastitis in dairy cows worldwide reach up to 35 billion US dollars

[1] ILRI. 2021. Keeping livestock healthy and well cared for improves animal, human, environment and economic health. Livestock pathways to 2030: One Health Brief 5. Nairobi: International Livestock Research Institute
 [2] Mastitis: Symptoms of Breast Infection. Niruja HealthTech



Background

- ❑ The gut microbiota is closely linked to multiple distal organs.
- ❑ The concept of gut-derived mastitis provides a new direction for mastitis therapy.



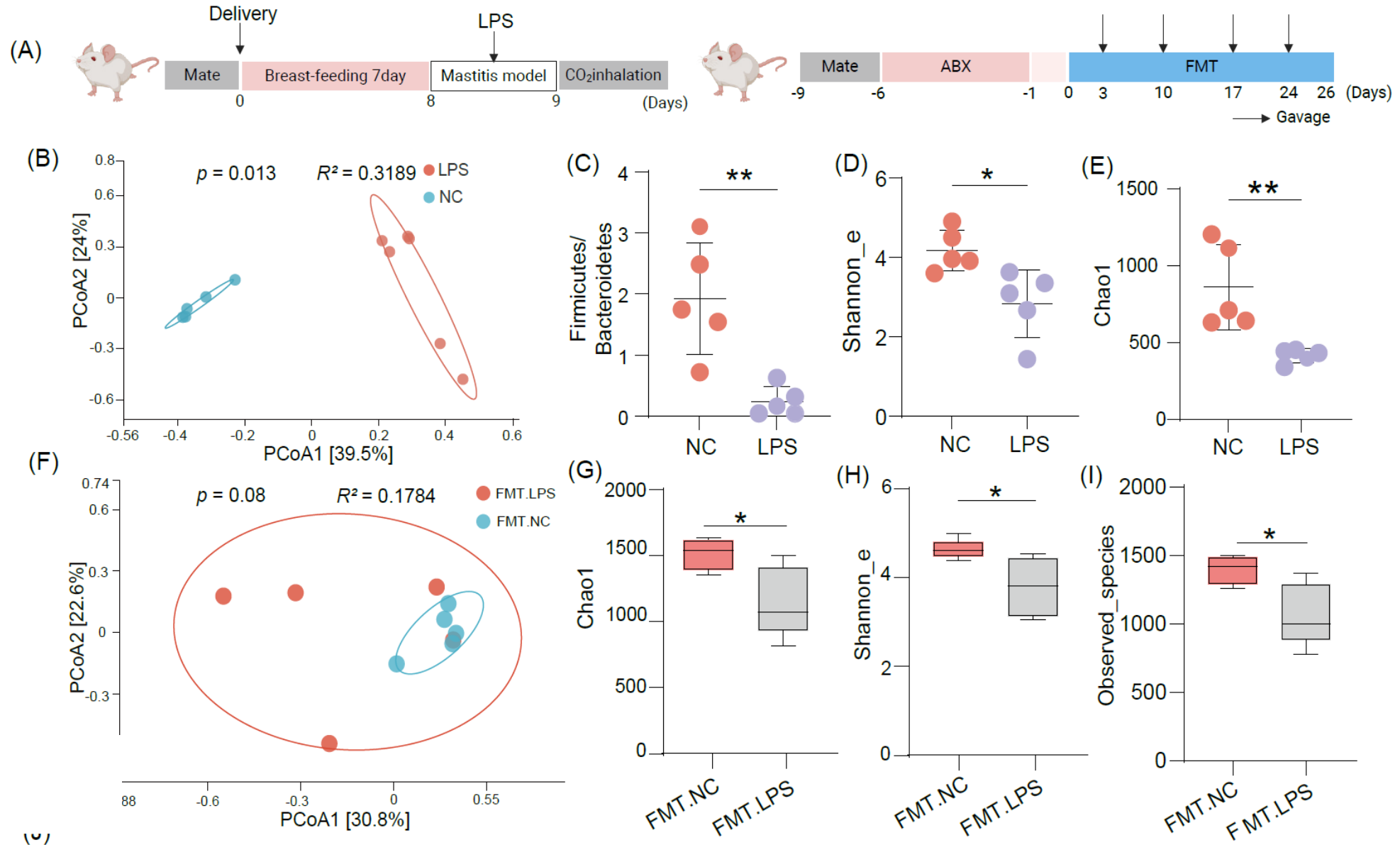
Fan, Y., Pedersen, O. Nat Rev Microbiol 19, 55–71 (2021).

Xiaoyu Hu et.al J Adv Res. 2024 Jan;55:159-171.



Results

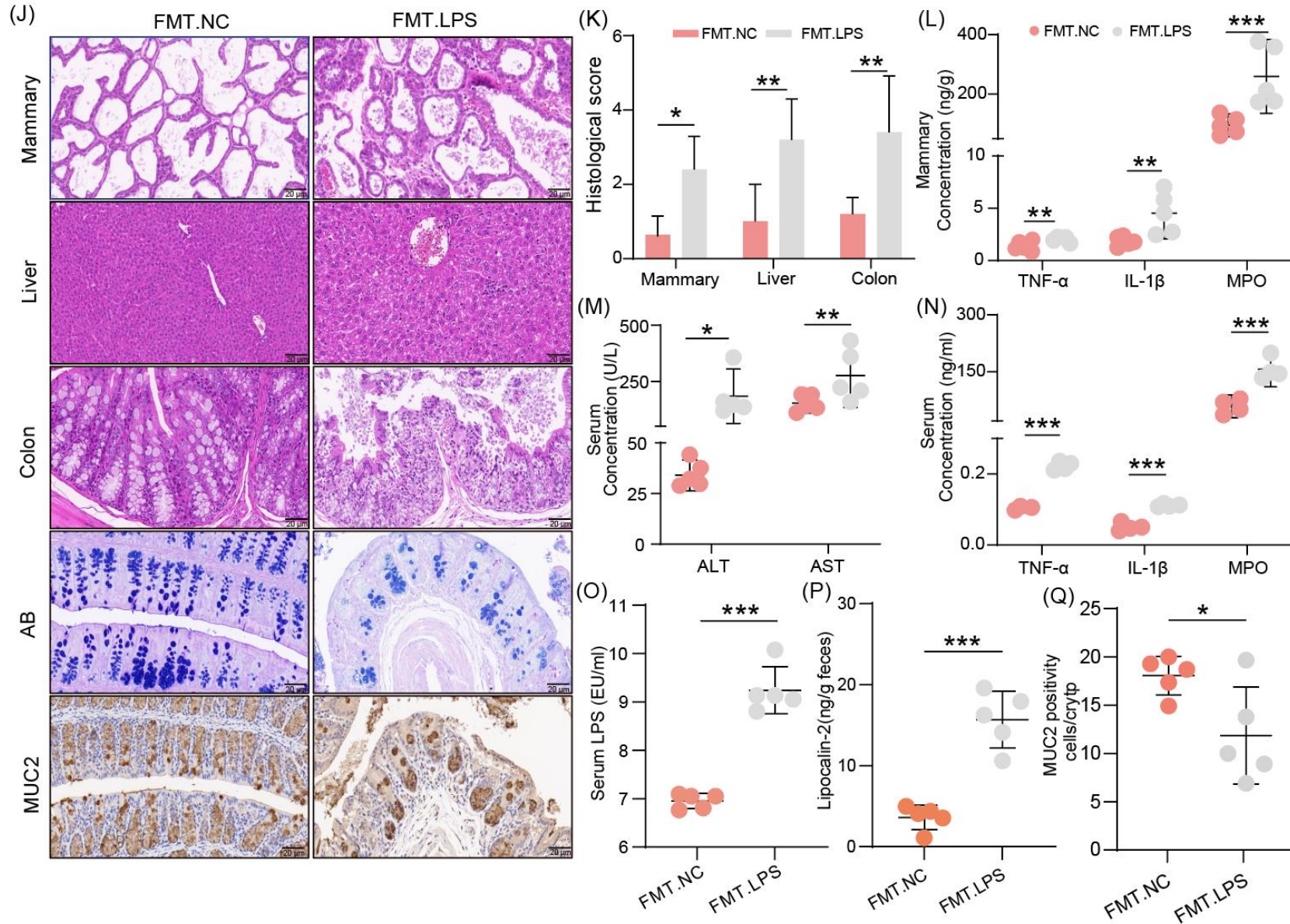
□ LPS-induced mastitis markedly alters mouse gut microbiota composition





Results

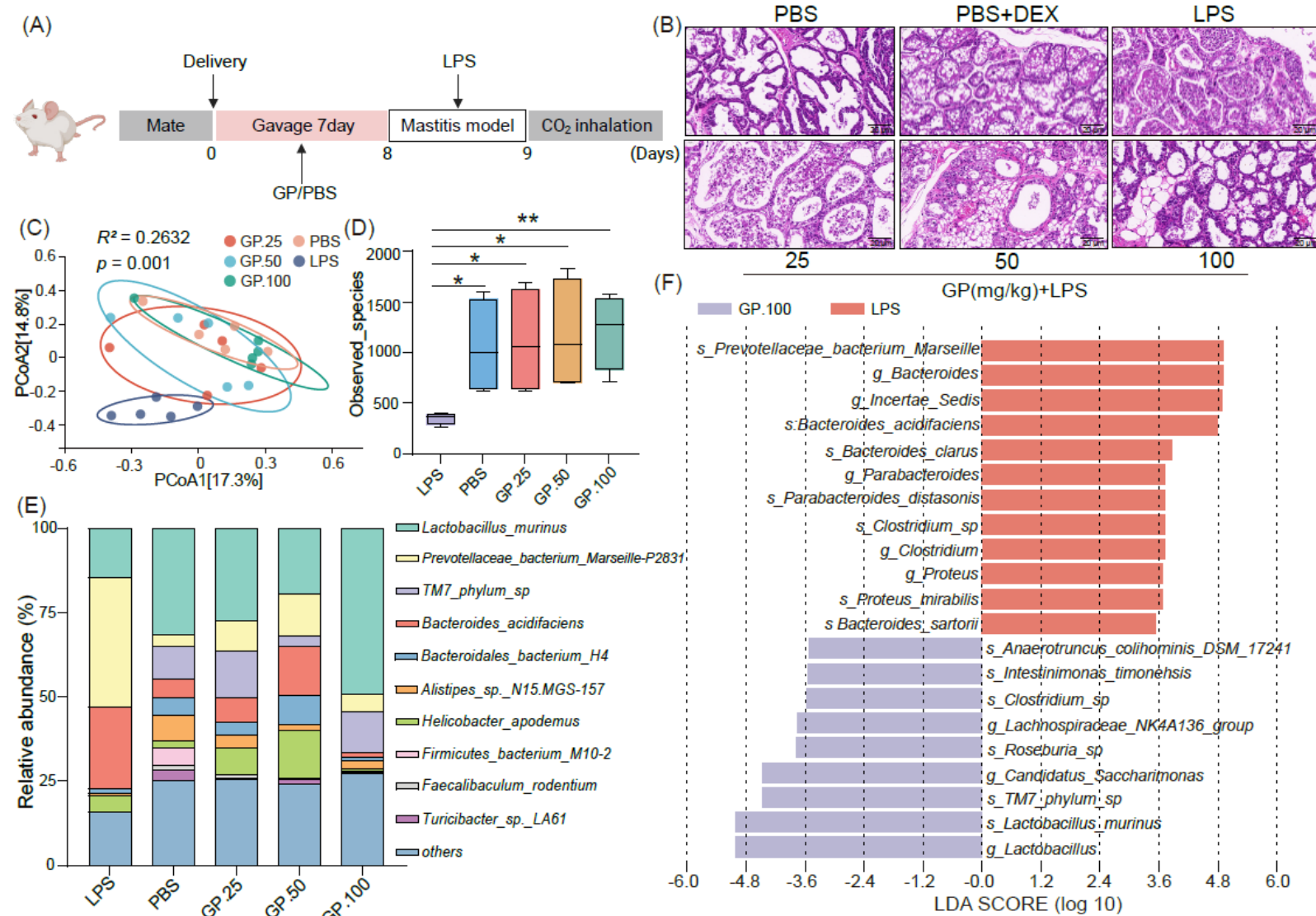
□ FMT from mastitis mice to recipients induced mastitis and systemic inflammation.





Results

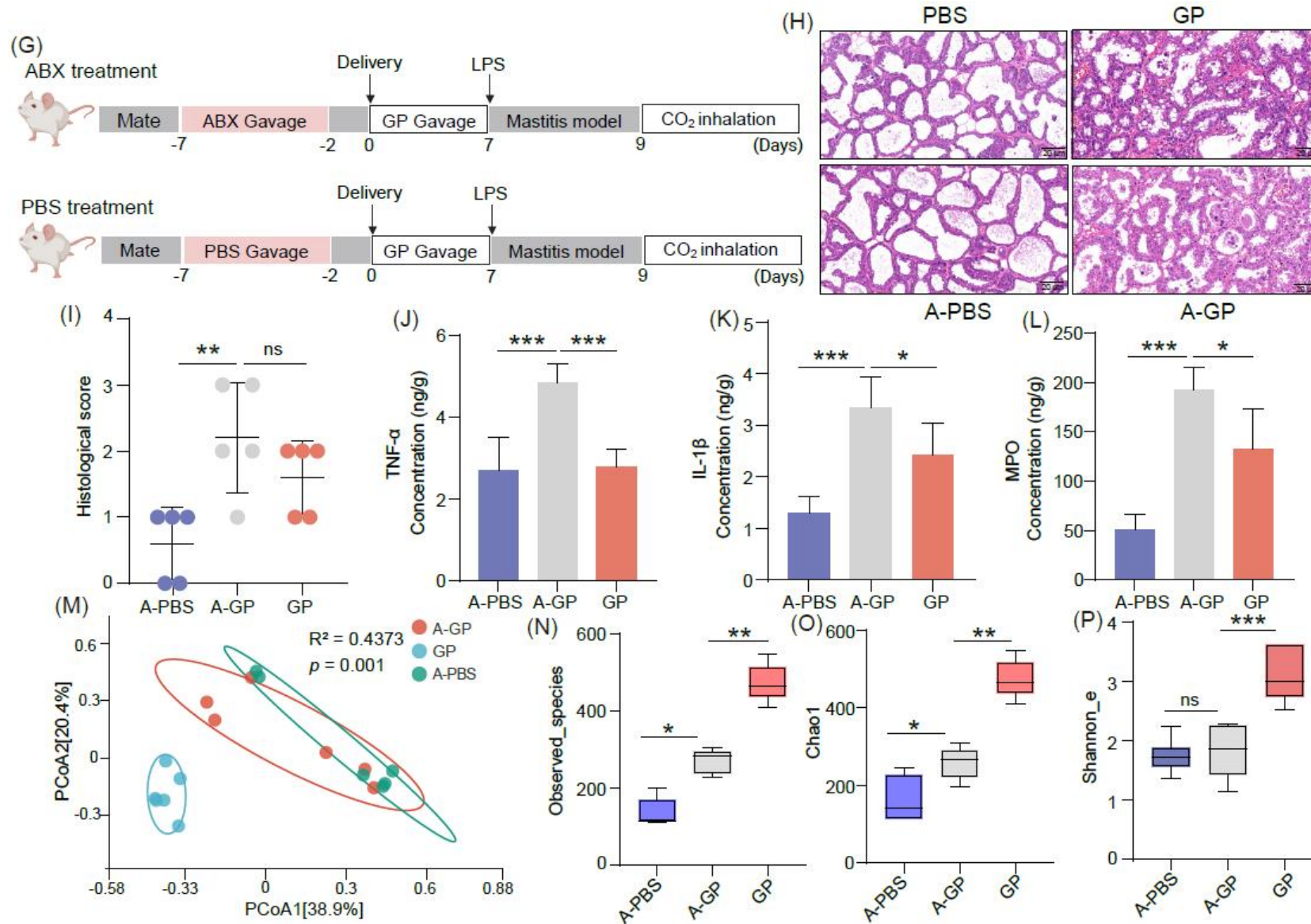
- Ginseng polysaccharides (GP) alleviate LPS-induced mastitis and significantly enrich *Lactobacillus murinus*.





Results

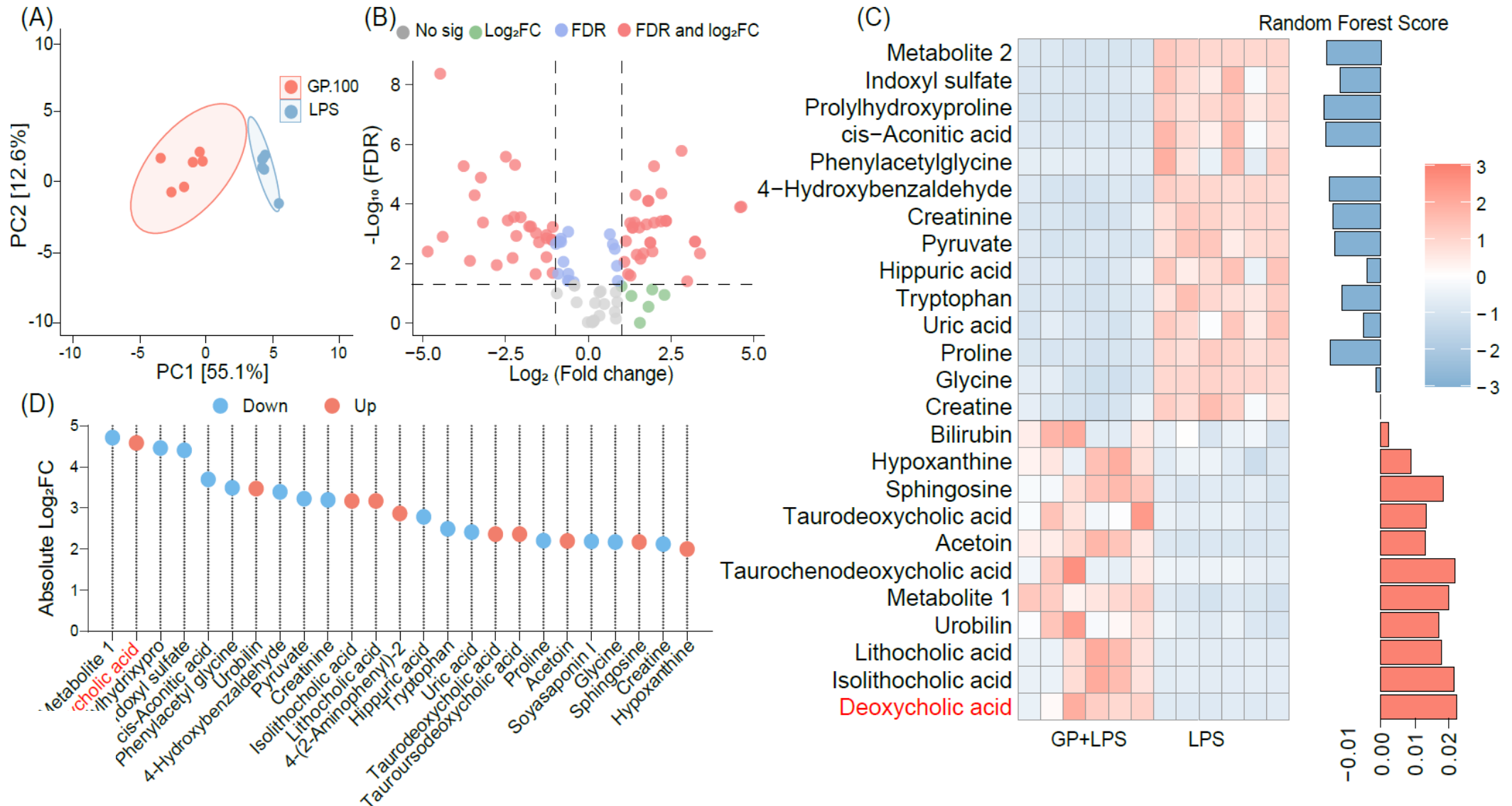
□ Ginseng polysaccharides exert anti-inflammatory effects dependent on the gut microbiota.





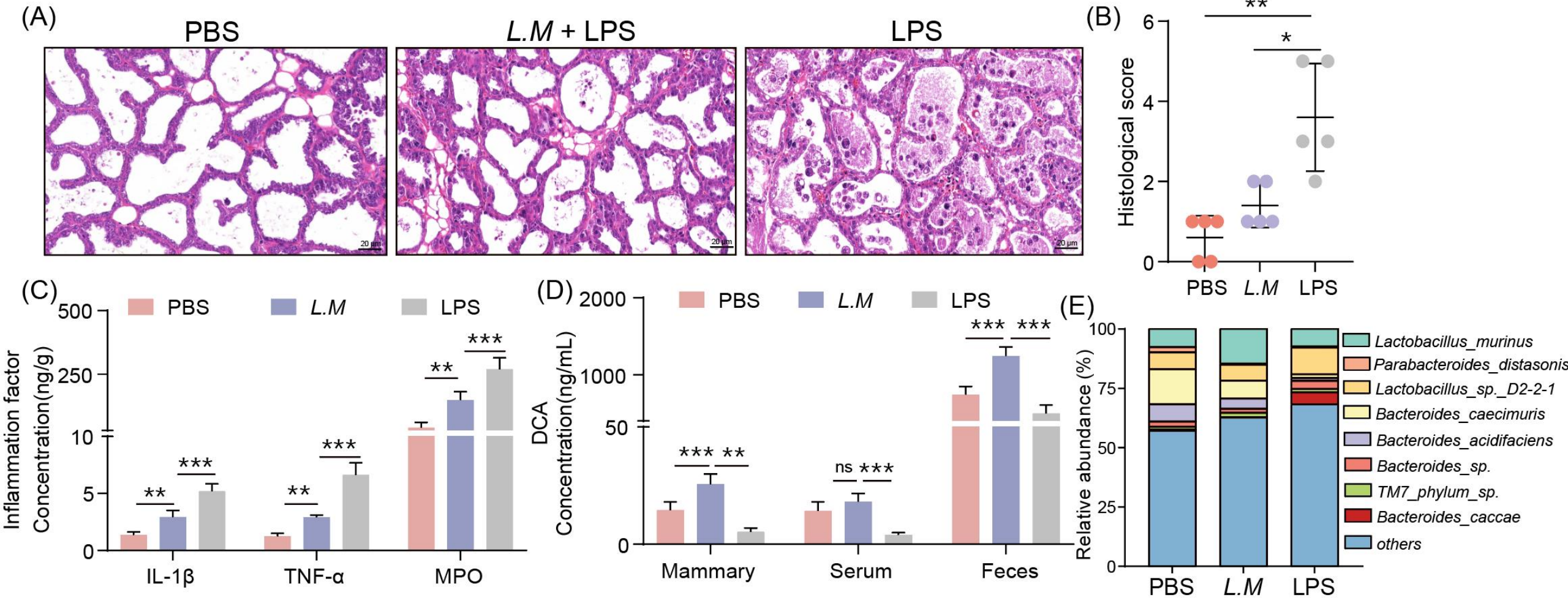
Results

GP treatment altered metabolism and increased Deoxycholic acid levels.



Results

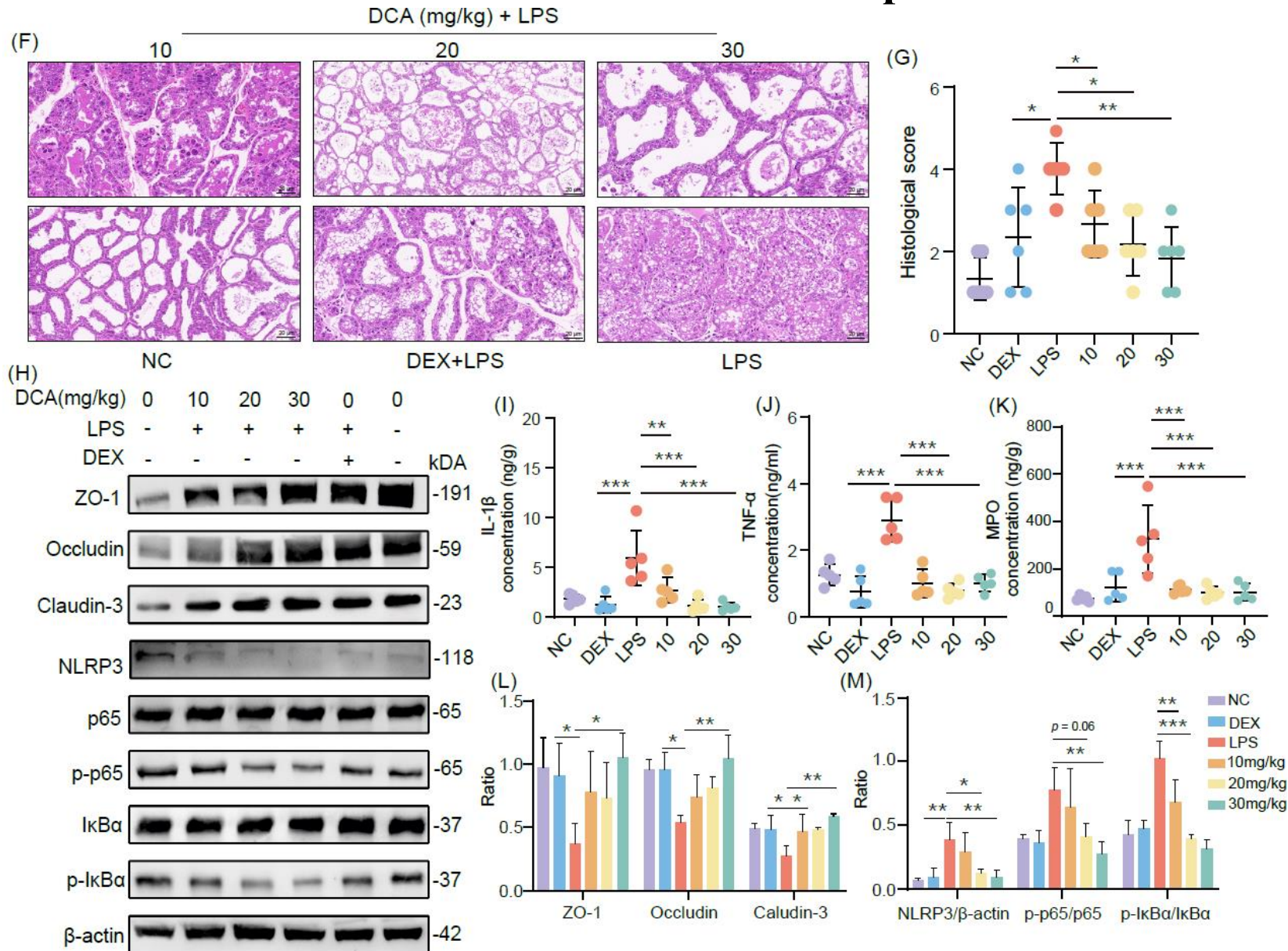
□ Oral *L. murinus* alleviated LPS-induced mastitis and increased deoxycholic acid levels in blood and mammary tissue.





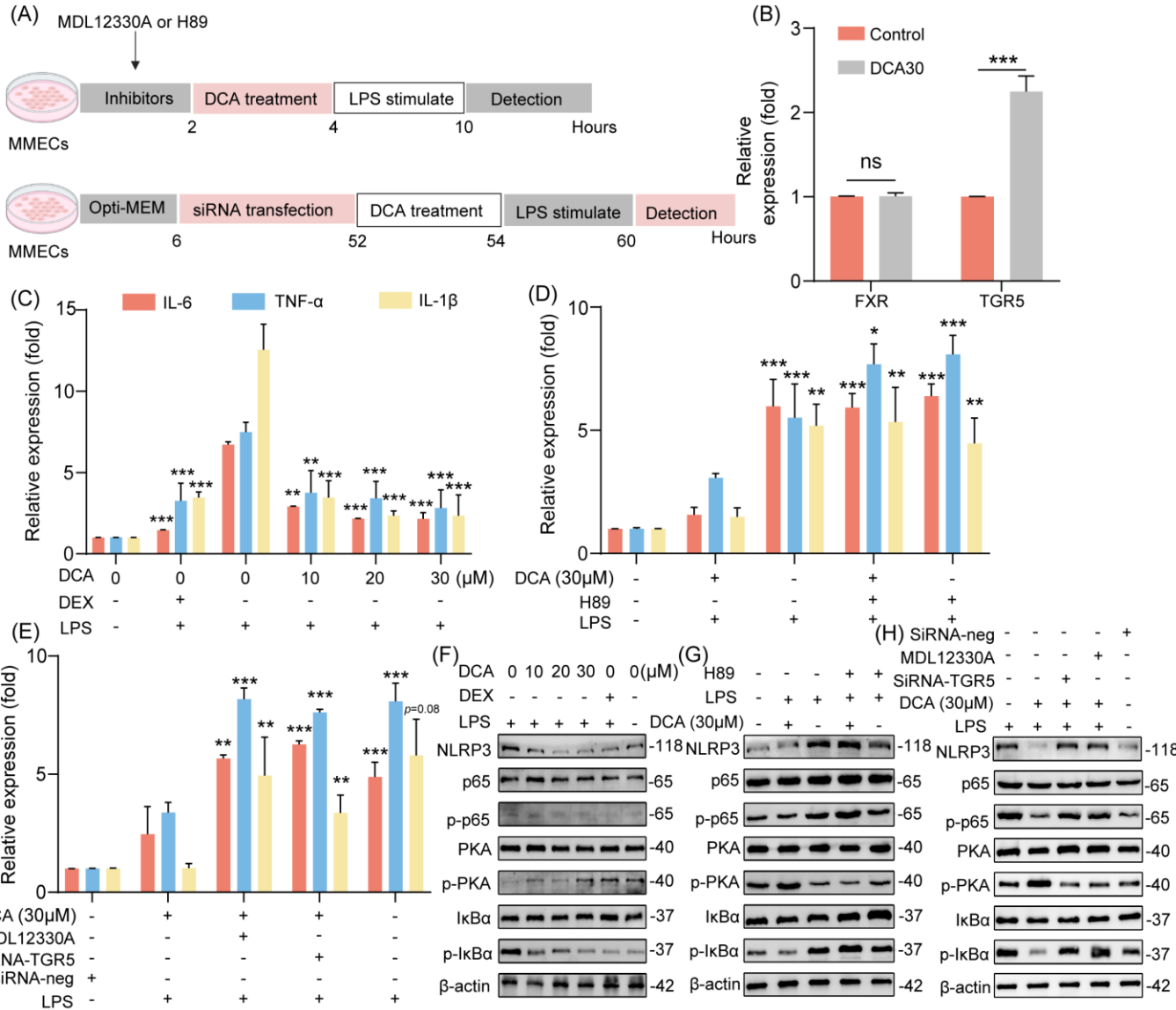
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□ Deoxycholic acid alleviates LPS-induced mastitis and preserves the blood-milk barrier.

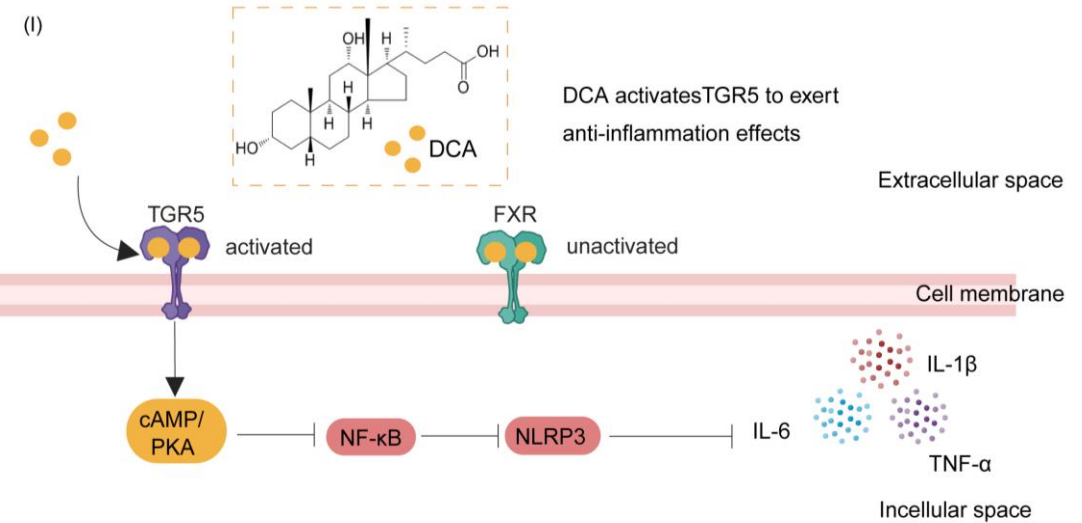




Results

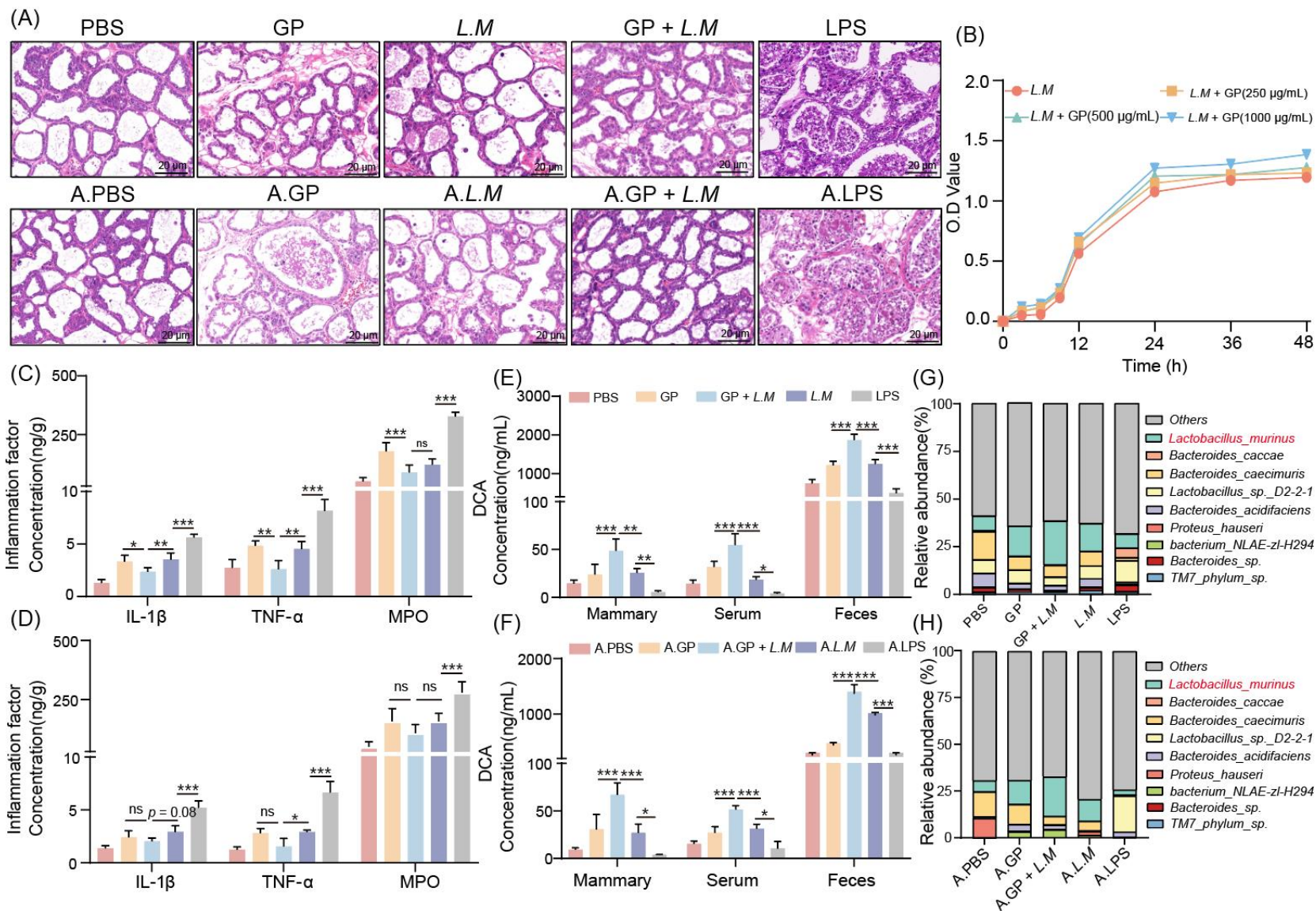


□ Deoxycholic acid inhibits LPS-induced inflammation via the TGR5-cAMP-PKA-NF- κ B pathway.



Results

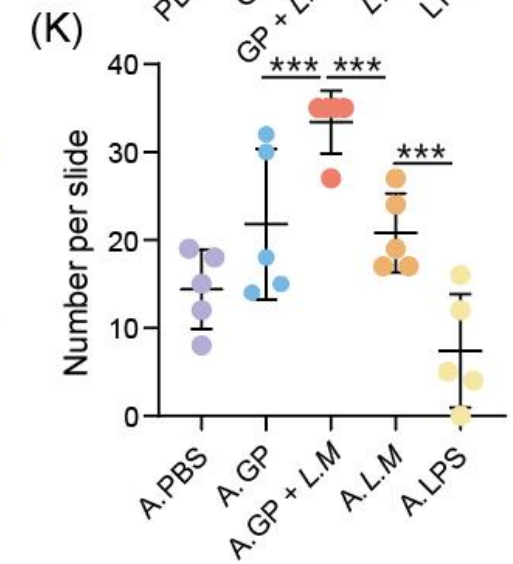
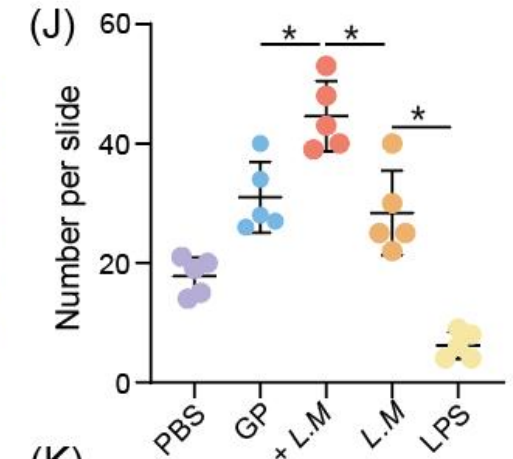
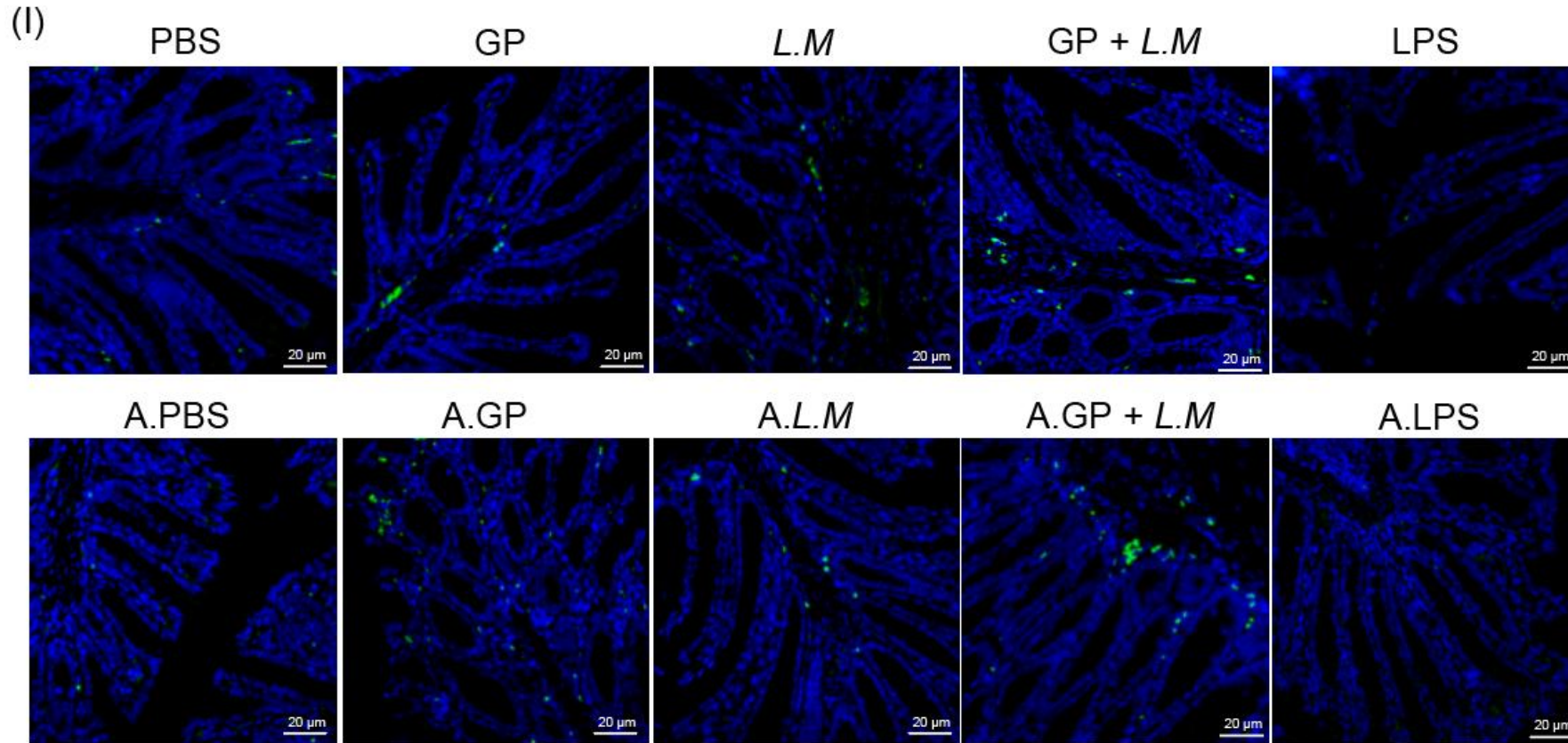
□ The combination of GP and *L. murinus* as a synbiotic exerts a potent alleviating effect on LPS-induced mastitis.





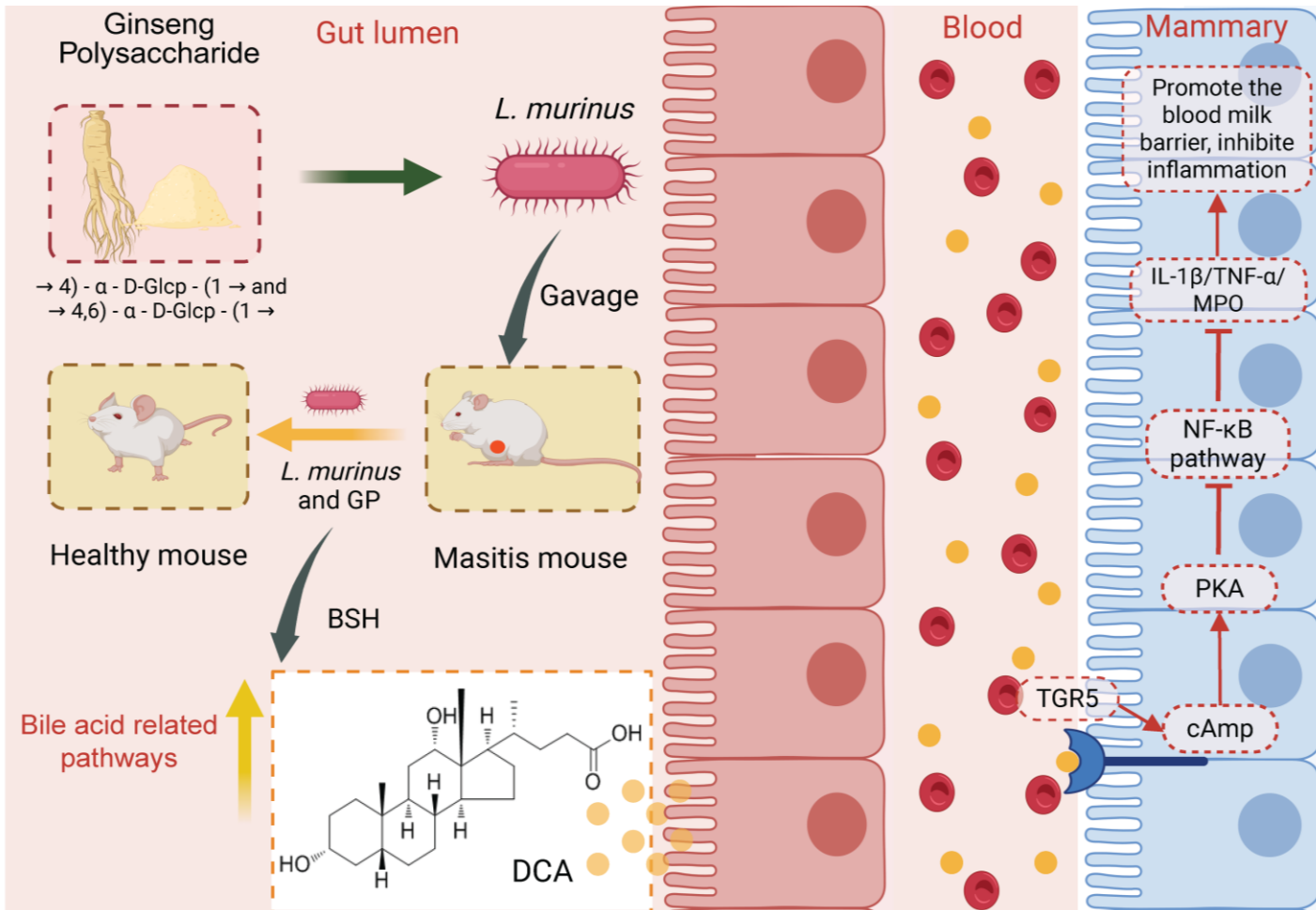
Results

□ GP promotes the intestinal colonization of *L. murinus*.





Conclusion



- ❑ Ginseng polysaccharides effectively alleviate LPS-induced mastitis in mice
- ❑ Ginseng polysaccharides can enrich and promote intestinal colonization of *Lactobacillus murinus*.
- ❑ *Lactobacillus murinus*-derived deoxycholic acid alleviates LPS-induced mastitis in mice via the TGR5/cAMP-PKA signaling pathway.
- ❑ The combined use of Ginseng polysaccharide and *Lactobacillus murinus* as a synbiotic exerts a potent alleviative effect on LPS-induced mastitis.

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