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### Postnatal maturation of intestinal microbiome by oxygen intervention promotes type 3

#### Abstract:

Infections are a major cause of early postnatal mortality in neonates, which can be attributed to an immature immune system in the neonates. Early life is a vital period for mammals to be colonized with the microbiome, which profoundly influences the development of intestinal immune function. Through the use of technologies such as Hypoxyprobe, 16s rRNA sequencing, whole-intestinal microbiota transplantation, LC-MS/MS, and flow cytometry, we found that *S.boulardii*'s early intervention reduced the oxygen environment and promoted the maturation of the microbiome in the intestine of neonatal rats, especially boosted the colonization of *Lactobacillus* and restricted the colonization of streptococcus. Moreover, oxygen consumption promoted the proliferation and cytokines secretion of type 3  $\gamma\delta$  T cells and ILCs and then alleviates the mortality rate and bacterial loading induced by *S.typhimurium* infection in neonatal rats. Mechanically, microbiome maturation downregulates FXR by accelerating the formation of secondary bile acids and then promotes the Rorgt expression (transcription factor of type 3 immunity), which is correlated with the colonization of *Lactobacillus* in early life.

#### Biography

**Hongkui Wei** (1986-): Dr. Hongkui Wei received a Ph.D. degree from Huazhong Agricultural University in 2012, and then he works in the School of Animal Science and Technology, School of Animal Medicine, Huazhong Agricultural University as an Associate Professor. His main research interests are the interaction between the intestinal microbiome and the innate immune system in the early, and the nutritional mechanism and metabolic regulation of fatty acids and amino acids.