

## 371 | Effect of the adaptive immune system on the homeostasis and function of the enteric nervous system

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A complex set of tissues of distinctive embryological origin (such as the intrinsic immune and nervous systems) continuously interact to maintain a normal physiology of the gastrointestinal (GI) tract, which is constantly threatened by several and sometimes severe challenges originated within the wall or the lumen of the gut. The enteric nervous system (ENS) is composed of an intricate network of enteric glial cells (EGCs) and neurons localised into different compartments within the GI wall. These cells are involved in regulating virtually all aspects of GI physiology, including intestinal peristalsis. The ENS shares the same intestinal environment with the highly active immune system, due to its positioning at the interface between the internal and external milieu of the body, and therefore is expected to be influenced by immune responses. However, the methodology to explore these questions and consequently our understanding of neuro-immune communications in the mammalian gut is limited. In this work, we examined the effects of the absence of the adaptive immune system on the homeostasis and function of the ENS in adult animals. We have effectively generated a robust technology to isolate and evaluate the molecular landscape of enteric neurons from the adult gut. Moreover, by using immunodeficient mouse models lacking T and B lymphocytes (*Rag1*<sup>-/-</sup> and *Rag2*<sup>-/-</sup>) and only T cells (*Tcrα*<sup>-/-</sup>), our experiments revealed that in the absence of the adaptive immune cells, there is an impaired network of EGCs and neurons within the myenteric ganglia. These changes are followed by alterations on the expression of important genes by ENS cells. Besides, the frequency of the neuronal colonic motility (CMMCs) is decreased in mice lacking the adaptive immune system. Together, our data suggest that the adaptive immune system is crucial for maintaining the integrity and functional equilibrium of the ENS.