

Effects of selected prebiotics on *Salmonella* infection in a mouse model

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Salmonella enterica is a Gram-negative facultative intracellular anaerobe of worldwide importance causing as many as 1.3 billion cases of disease annually. Due to the severity of infections caused by this pathogen, both on afflicted people and society, it is of great importance to find ways to avert *Salmonella* entry through the intestinal epithelium. In this study we focused on enhancing resistance to *Salmonella* challenge through modulation of the indigenous gut microbiota. This was done by use of a murine infection model to examine the efficacy of administration of different complex, indigestible polysaccharides, i.e. prebiotics, prior to infection. Different prebiotics reported to exert a beneficial effect on the host through selective stimulation of intestinal bifidobacteria and lactic acid bacteria, were administered for comparison. In order to elucidate the immunomodulatory effects of the pre-fed compounds, the cellular composition of the mesenteric lymph nodes and the spleen from infected mice was characterized using flow cytometry. Of all the cell subsets analyzed, only the proportions of neutrophils were significantly increased upon infection, irrespectively of the prebiotic administered. We also found a positive correlation between the number of neutrophils in the spleen and the CFU of *Salmonella* in the organs of the infected mice, but not the CFU of *Salmonella* in the ileum, indicating that the neutrophil number reflects an immune response towards the bacteria translocated to the organs rather than the quantity of *Salmonella* present in the gastrointestinal tract. This is in accordance with earlier findings demonstrating that neutrophils are important for host survival during the primary response to *Salmonella* infection, primarily due to control of bacterial replication.

In conclusion, we found no effect in relation to immunological parameters of prefeeding with any of the selected prebiotics prior to *Salmonella* infection.