Gut microbiota composition does not associate with Toxoplasma infection in rats

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Abstract

Toxoplasma infection in intermediate host species closely associates with inflammation. This association has led to suggestions that the behavioural changes associated with infection may be indirectly driven by the resulting sustained inflammation rather than a direct behavioural manipulation by the parasite. If this is correct, sustained inflammation in chronically infected rodents should present as widespread changes in the gastrointestinal microbiota due to the dependency between the composition of these microbiota and sustained inflammation. We conducted a randomized controlled experiment in rats that were assigned to a Toxoplasma-treatment, placebo-treatment or negative control group. We sacrificed rats during the chronic phase of infection, collected their cecal stool samples and sequenced the V3-V4 region of the 16S rRNA gene to characterise the bacterial community in these samples. Toxoplasma infection did not induce widespread changes in the bacterial community composition of the gastrointestinal tract of rats. Rather, we found sex differences in the bacterial community composition and only minor changes in Toxoplasma infected rats. We conclude that it is unlikely that sustained inflammation is the mechanism driving the highly specific behavioural changes observed in Toxoplasma-positive rats.

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