Abstract

The intestinal microbiota is composed of up to 100 trillion microorganisms of which bacteria are overwhelming majority. The microbiota affects the development of the immune system, defence against pathogens, host nutrition, vitamin synthesis or fat storage and its composition is changing throughout life. Some studies point to an association between microbiota composition and the development of inflammatory bowel disease. One of the treatment options is anti-TNFα antibodies therapy, which uptake or antagonize the TNFα cytokine that otherwise mediates inflammation in the intestinal mucosa.

The aim of the thesis was to examine how this treatment affects the composition of the intestinal bacteriome in paediatric patients with Crohn´s disease, and to find specific bacterial taxa, whose abundance changes during the treatment. By inclusion of patients with juvenile idiopathic arthritis, also treated with anti-TNFα, the study aims to discern specific effects of therapeutically induced intestinal restitution (observable in patients with Crohn´s disease) from general effects of anti-TNFα therapy. Stool samples from healthy children were used to determine "healthy" bacteriome. The composition of the bacteriome was studied by profiling the variable region of the V4 gene of 16S rDNA from patients stool samples and healthy controls using next generation sequencing. The obtained profiles were analysed using *vegan* and *phyloseq* tools in the R programming environment.

Patients with Crohn's disease had a different relative composition of the bacteriome as compared to healthy children and patients with juvenile idiopathic arthritis. Patients with Crohn's disease showed differences of alpha diversity, which is decreased after anti-TNFα treatment. Their bacteriomes more *Enterobacteriaceae* family and *Veillonella*, *Blautia* and *Escherichia* genus. This clade also increased upon the anti-TNFα therapy. Patients with juvenile idiopathic arthritis had a similar relative composition of the bacteriome as healthy control group. The effect of anti-TNFα treatment on the intestinal bacteriome in patients with juvenile idiopathic arthritis can't be presently assessed. The study is still ongoing, so these are a preliminary results.

Key words: bacteriome, stool, Crohn´s disease, anti-TNFα therapy, 16S rDNA profiling