# The fecal microbiota as a biomarker for disease activity in Crohn's disease

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**Introduction and objectives**
Crohn's disease (CD) is a chronic relapsing gastrointestinal disease and is associated by periods of active inflammation characterized by mucosal inflammation, alternated with periods of remission. Monitoring mucosal inflammation is crucial to limit disease progression and complications. Endoscopy of the gastrointestinal tract (golden standard) is an expensive and invasive procedure, whereas disease activity indices and noninvasive markers do not correlate well with endoscopic findings. The intestinal microbiota is involved in the disease progression of CD and differences in the fecal microbiota composition between patients in remission and patients with active disease could therefore potentially be used to monitor disease activity. The aim of this study was to investigate the potential use of the microbiota to accurately differentiate between CD patients in remission from those with an exacerbation.

**Material and methods**
194 fecal samples (97 remission and 97 active) of 71 CD patients were included in this study. Remission was defined HBI ≤ 4, serum CRP <5 mg/l and FC<100 µg/g and active disease was defined as FC>250 µg/g. The fecal microbiota was assessed by pyrosequencing of the V1-V3 region of the 16S rRNA gene. Random forest was used to find the most discriminatory microbial taxa (OTUs). An internal independent validation set was used to validate the model.

**Results and discussion**
A combination of 50 OTUs was able to correctly predict 73% of remission and 79% of active samples with an AUC of 0.82 (sensitivity: 0.79, specificity: 0.73). *F. prausnitzii* was associated with remission, while the presence of *Bacteroides fragilis* was associated with active disease.
By analyzing the microbial pattern of the fecal microbiota we show that the fecal microbiota can be used to differentiate CD patients in remission from those with active disease. This current study demonstrates the potential of the fecal microbiota as a noninvasive tool to monitor disease activity in CD.

**Theme:** Common gut disease