Reviewer's report

Title: Ulcerative colitis and irritable bowel patients exhibit distinct abnormalities of the gut microbiota

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Reviewer: Gunnar Loh

Reviewer's report:

The manuscript submitted by Narbad and co-workers describes the differences in intestinal microbiota composition between patients suffering from ulcerative colitis (UC) or irritable bowel syndrome (IBS) and healthy controls. PCR-Denaturing Gradient Gel Electrophoresis (DGGE) with universal and Bacteroides specific primers was used to analyze dominant bacteria in fecal samples obtained from the study subjects. Data was evaluated using a newly developed or adapted statistical method. Prominent bands were cut out of the gel and sequenced in order to identify important bacterial species.

The authors report a decreased microbiota diversity and a higher variability of dominant bacteria in both IBS and UC patients in remission as compared to healthy controls. Diversity of Bacteroides spp. was lower in UC compared to IBS and healthy subjects. From sequencing prominent bands, the authors conclude that the absence of Bacteroides vulgatus, B. ovatus, B. uniformis, and Parabacteroides distasonis is an important feature in UC and IBS.

The most important finding of the study are largely of confirmative nature. Changes in gut microbiota composition have been demonstrated by culture-independent methods for IBD (e.g. Krogius-Kurikka et al. BMC Gastroenterology 2009, 9:95) and UC patients in remission (e.g. Martinez et al. Am J Gastroenterol. 2008, 103(3):643). A depletion of Bacteroides spp. in UC has also been shown previously (e.g. Frank et al. Proc Natl Acad Sci U S A. 2007, 104(34):13780).

It has to been mentioned that the role of the individual Bacteroides spp. in IBS and UC has possibly been over-interpreted because the similarities of the sequences to sequences in databases is -with the exception of B. vulgatus- too low for valid identification.

However, an improvement of DGGE profil analysis is not without merits. One of the major limitations of DGGE is the fact that different gels cannot easily be compared and that the number of samples that can be loaded on one single gel is limited. If it is now possible to compare different DGGE gels with an improved method for gel alignment, this method can be used to analyze and compare microbiota communities in larger study groups. By confirming the results of studies (see above) in which more cutting-edge but also much more costly and laborious methods have been used, the validity of this new method can nicely be demonstrated.
I recommend to better work out the technical improvement of DGGE data analysis and to re-submit the manuscript to be published in the "Technical Advances" section of the journal. The novelty of the improved technique must become clear. Thus, in such a revision, the decisions made to improve gel and data handling must be comprehensible to the reader (section "DGGE profil analysis"). Please state shortly the advances in data interpretation that can be achieved by using PLS-DA or CVA and the consequences for further data evaluation and interpretation.

Check the figure numbering.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests