

## **Rapid and accurate diagnosis of human intestinal spirochetosis by fluorescence in situ hybridization.**

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### **Source**

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### **Abstract**

Human intestinal spirochetosis (HIS) is associated with overgrowth of the large intestine by spirochetes of the genus *Brachyspira*. The microbiological diagnosis of HIS is hampered by the fastidious nature and slow growth of *Brachyspira* spp. In clinical practice, HIS is diagnosed histopathologically, and a significant portion of cases may be missed. Fluorescence in situ hybridization (FISH) is a molecular method that allows the visualization and identification of single bacteria within tissue sections. In this study, we analyzed intestinal biopsy samples from five patients with possible HIS. All specimens yielded positive results by histopathological techniques. PCR amplification and sequencing of the 16S rRNA gene were performed. Sequences of two isolates clustered in the group of *Brachyspira aalborgi*, whereas in three cases, the sequences were highly similar to that of *Brachyspira pilosicoli*. Three phylotypes showed mismatches at distinct nucleotide positions with *Brachyspira* sp. sequences published previously. In addition, culture for *Brachyspira* was successful in three cases. On the basis of these data, we designed and evaluated a *Brachyspira* genus-specific 16S rRNA-directed FISH probe that detects all of the *Brachyspira* spp. published to date. FISH of biopsy samples resulted in strong, unequivocal signals of brush-like formations at the crypt surfaces. This technique allowed simultaneous visualization of single spirochetes and their identification as *Brachyspira* spp. In conclusion, FISH provides a fast and accurate technique for the visualization and identification of intestinal spirochetes in tissue sections. It therefore represents a valuable tool for routine diagnosis of HIS.

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