

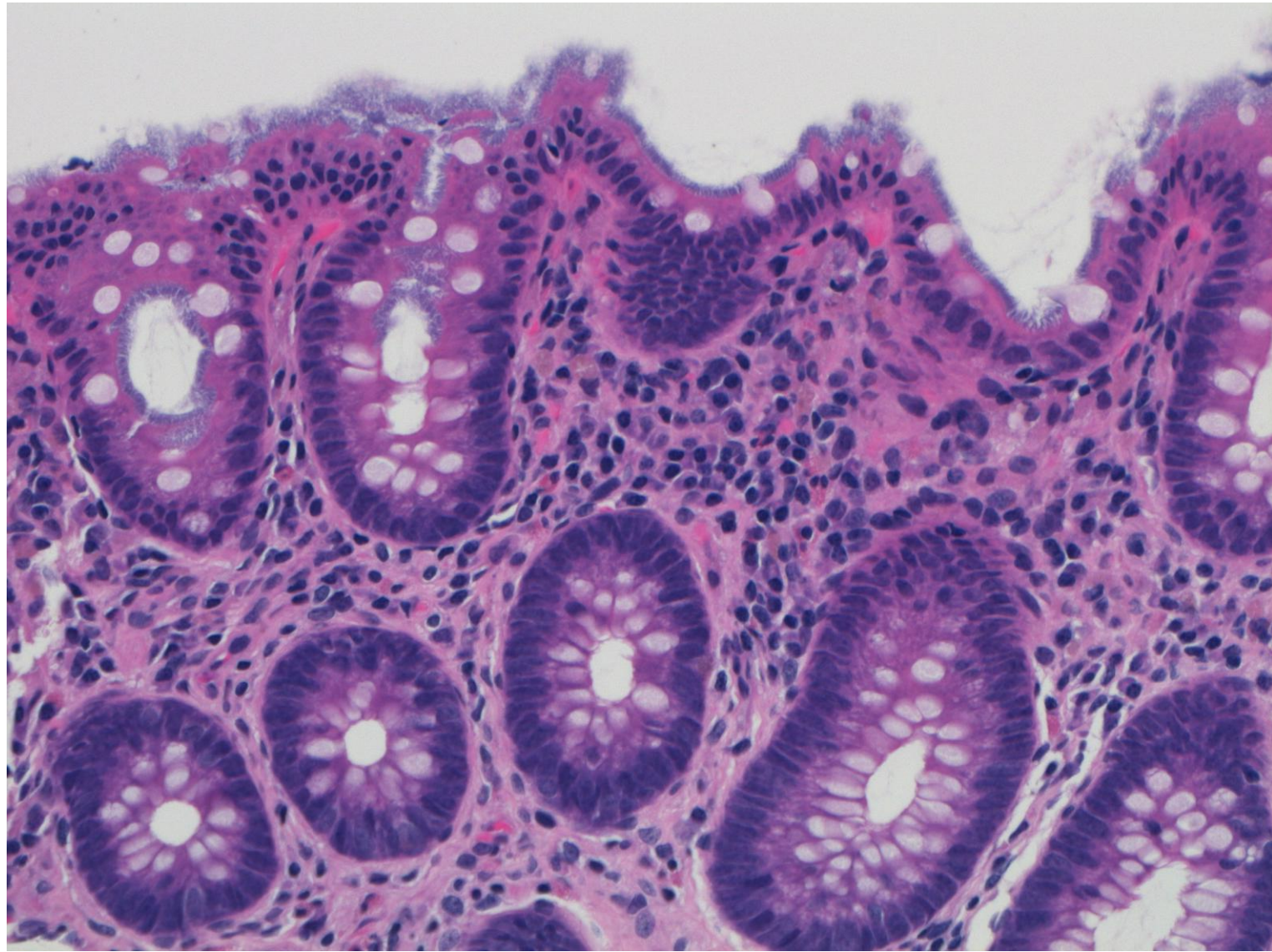
Intestinal spirochetosis

Human intestinal spirochetosis is histologically defined by the presence of spirochetal microorganisms attached to the apical cell membrane of the colorectal epithelium. Intestinal spirochetes comprise a heterogeneous group of bacteria. In humans, *Brachyspira aalborgi* and *Brachyspira pilosicoli* predominate. The size of the bacteria are long (7 µm) in *B. pilosicoli*, and short (4 µm) in *B. aalborgi*. *B. pilosicoli* may derive from the dogs and cats (as a zoonotic infection).

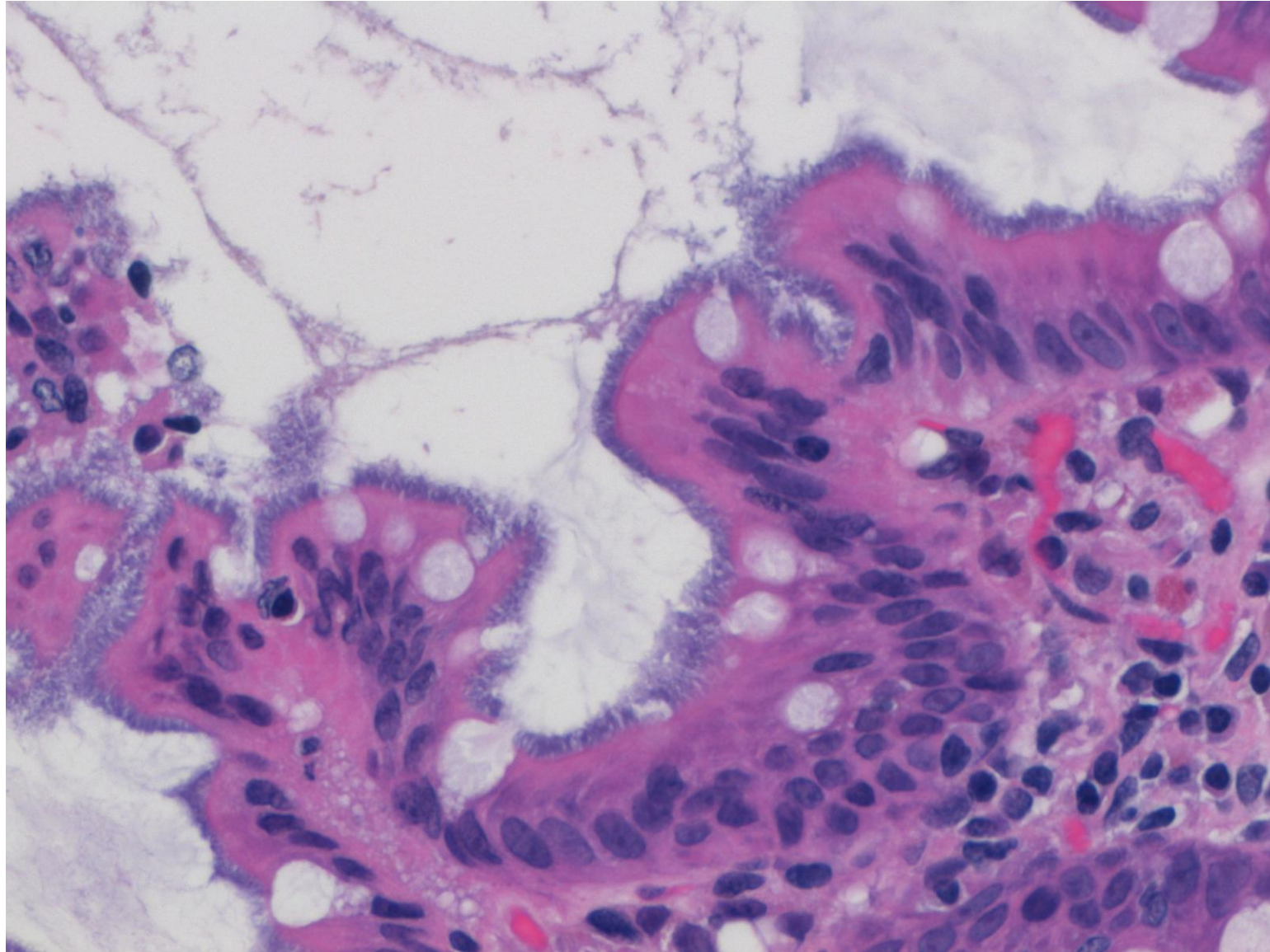
The disease is common in poorly developed countries and among homosexuals and HIV-infected individuals. Metronidazole is effective for treatment. Most individuals lack symptoms, while homosexual and HIV-positive men as well as children may be symptomatic with watery diarrhea and abdominal pain, particularly in case of *B. pilosicoli* infection. When symptomatic, the possibility of co-existing protozoan (amebic) infection and ulcerative colitis should be excluded.

Ref.-1: Tanaka Y, et al. Identification and characterization of *Brachyspira aalborgi* and *Brachyspira pilosicoli* isolated from humans. Nihon Rinsho Biseibutsu Gakkai Zasshi 2016; 26(1): 30-40 (in Japanese with English abstract)

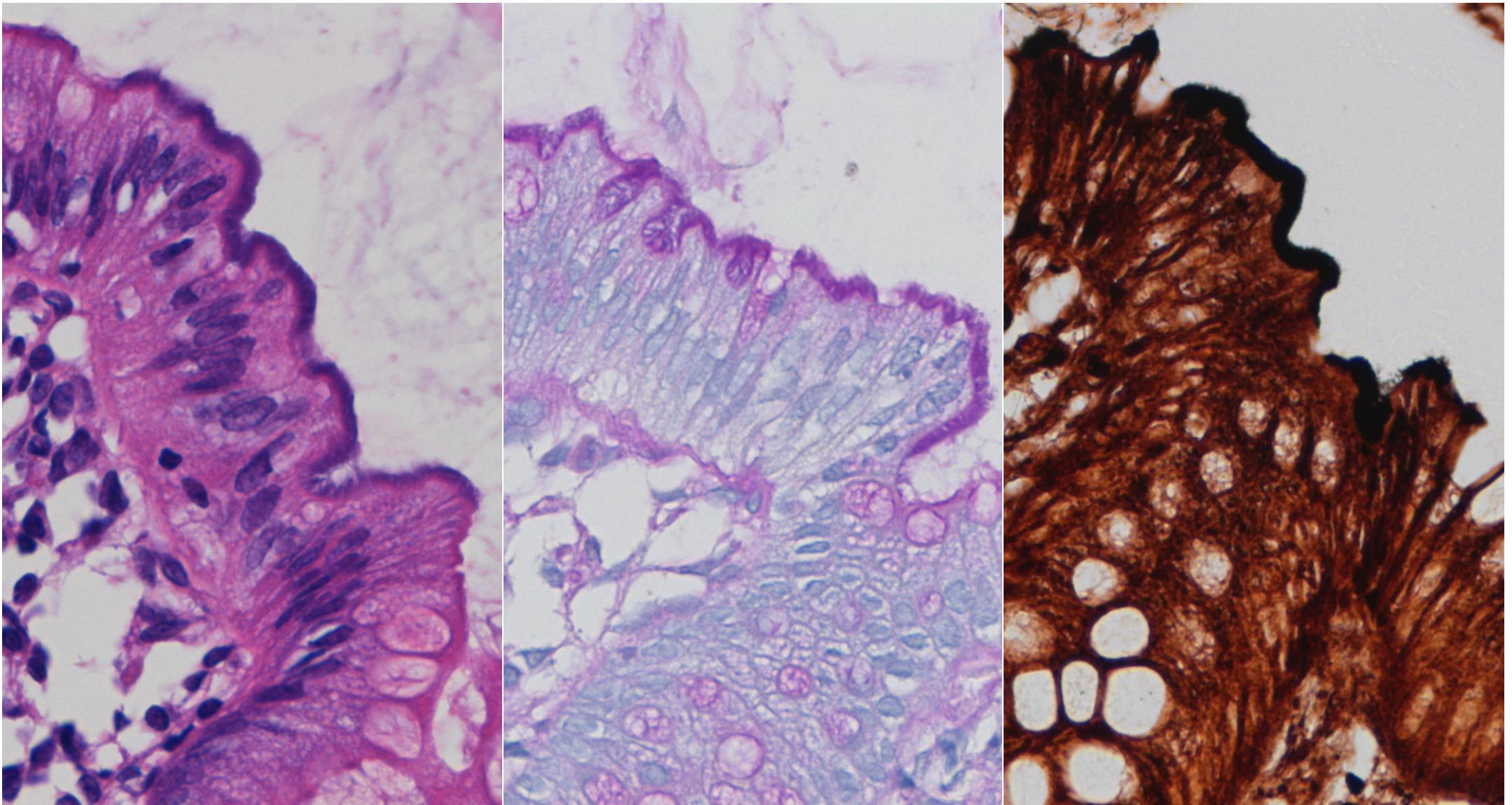
Ref.-2: Tsinganou E, Gebbers JO. Human intestinal spirochetosis: a review. Ger Med Sci 2010; 8: Doc01. doi: 10.3205/000090



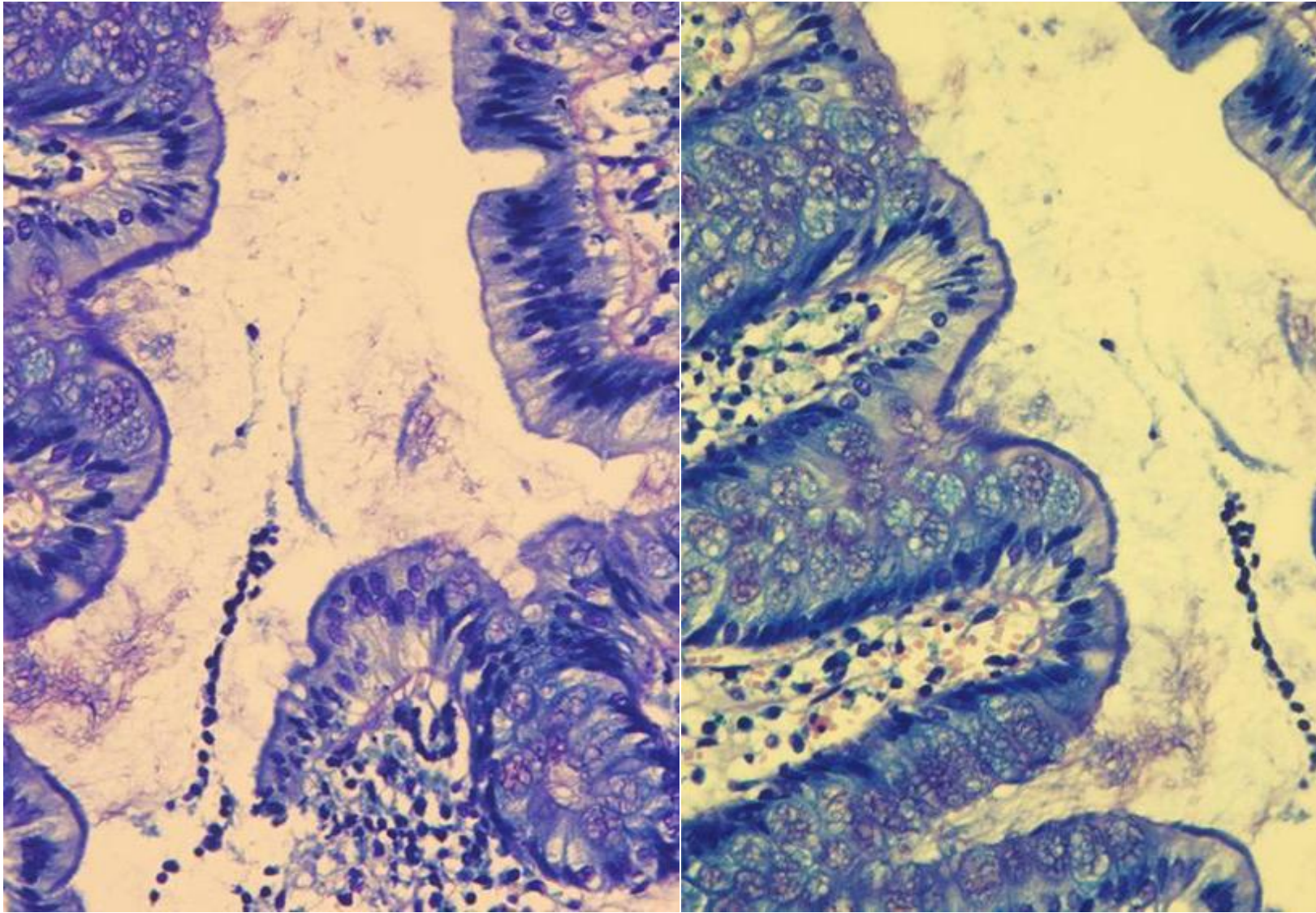
Intestinal spirochetosis. Colonic biopsy from a 55-year-old man shows thick basophilic bacteria colonized onto the surface columnar epithelium. H&E-1



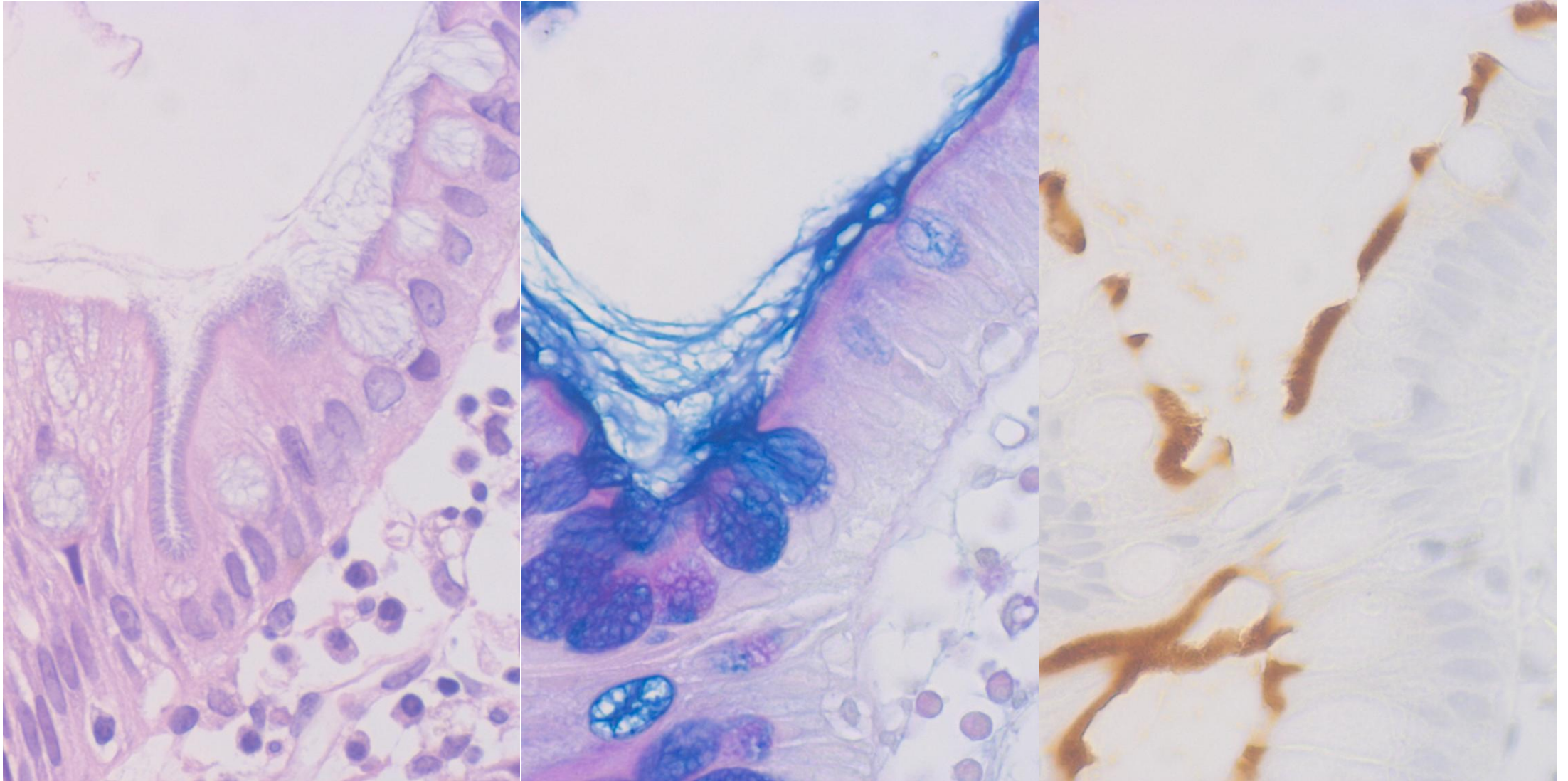
Intestinal spirochetosis. Colonic biopsy from a 55-year-old man shows thick basophilic bacteria colonized onto the surface columnar epithelium. H&E-2



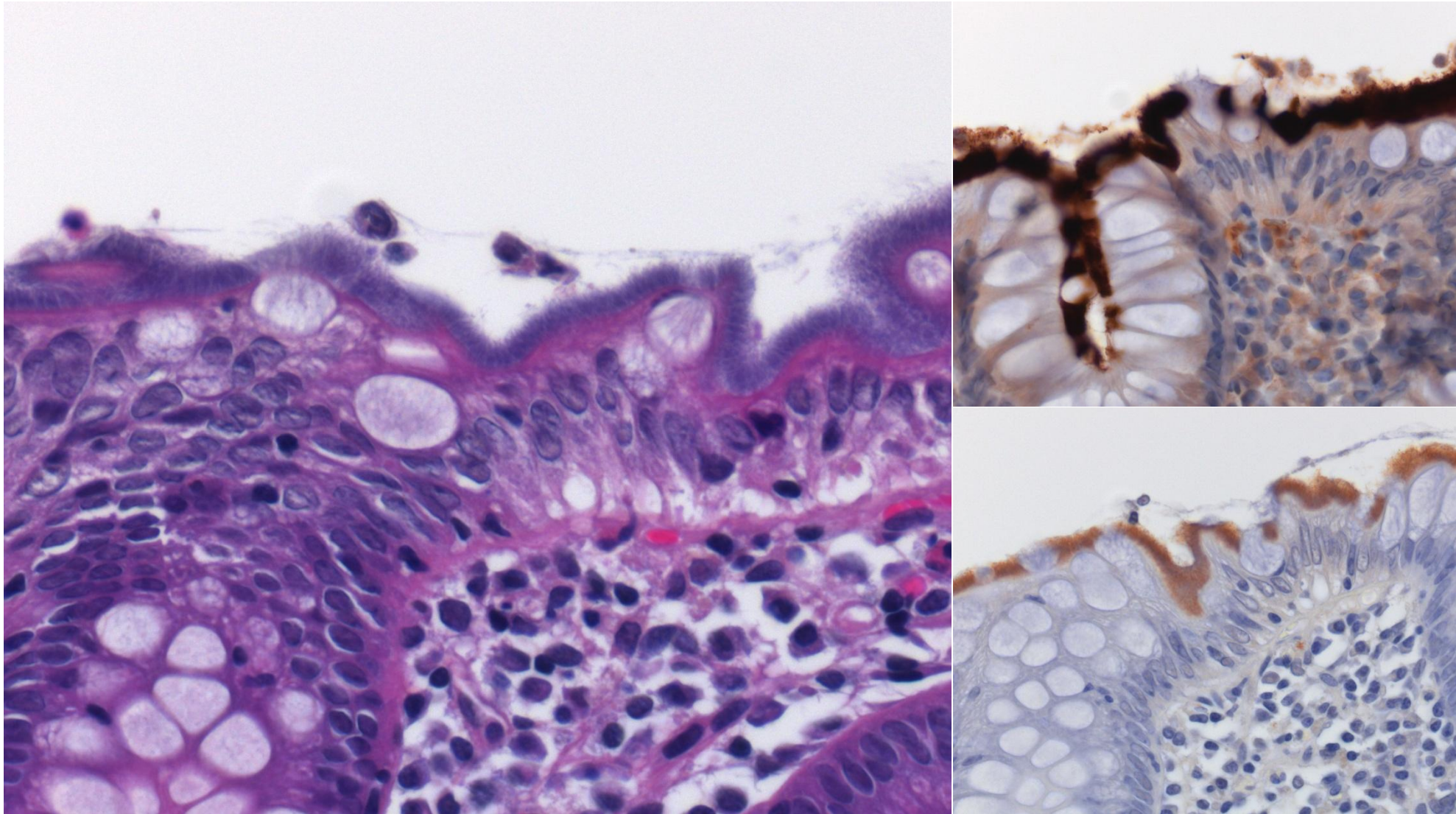
Intestinal spirochetosis. Colonic biopsy from a male patient aged 50's. Thick basophilic bacteria attached onto the surface columnar epithelium are positive with PAS and Warthin-Starry's silver. left: HE, center: PAS, right: Warthin-Starry



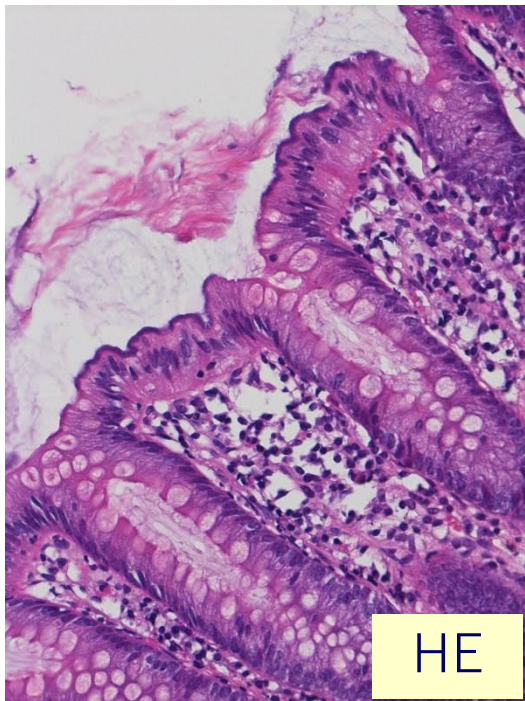
Intestinal spirochetosis. Colonic biopsy from a male patient aged 50's. Giemsa staining visualizes the thick basophilic bacteria attached onto the surface columnar epithelium. Giemsa



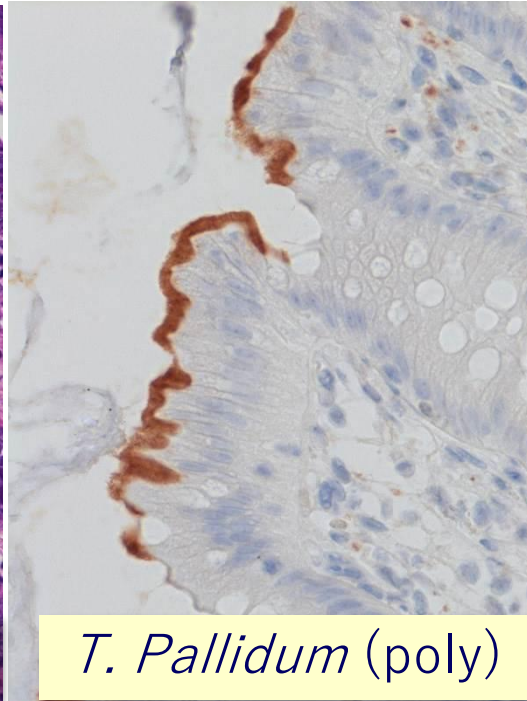
Intestinal spirochetosis. The spiral bacteria attached onto the columnar epithelial cells (left: H&E) are negative for alcian blue (center), The spiral bacteria are clearly demonstrated with a monoclonal antibody to *Treponema pallidum* (right).



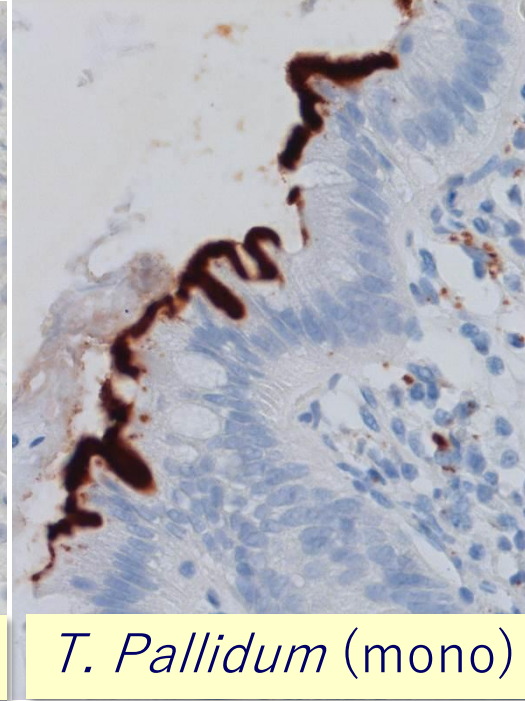
Intestinal spirochetosis (*Brachyspira aalborgi* infection). Polyclonal antiserum (right top) and monoclonal antibody (right bottom) to *Treponema pallidum* are cross-reactive to *B. aalborgi*.



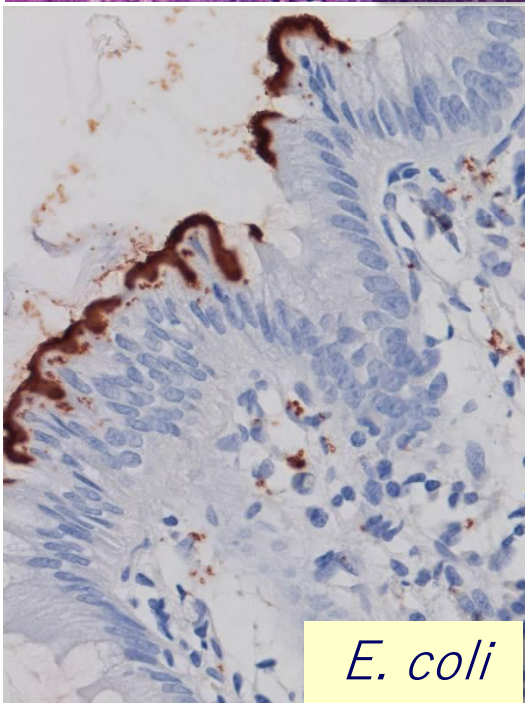
HE



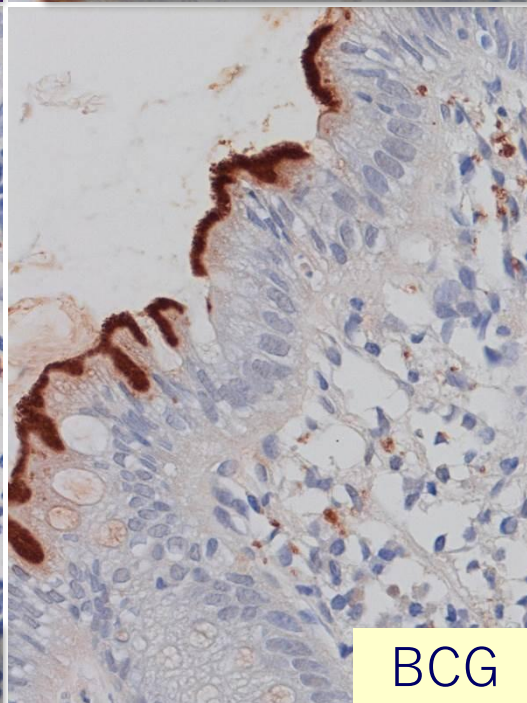
T. Pallidum (poly)



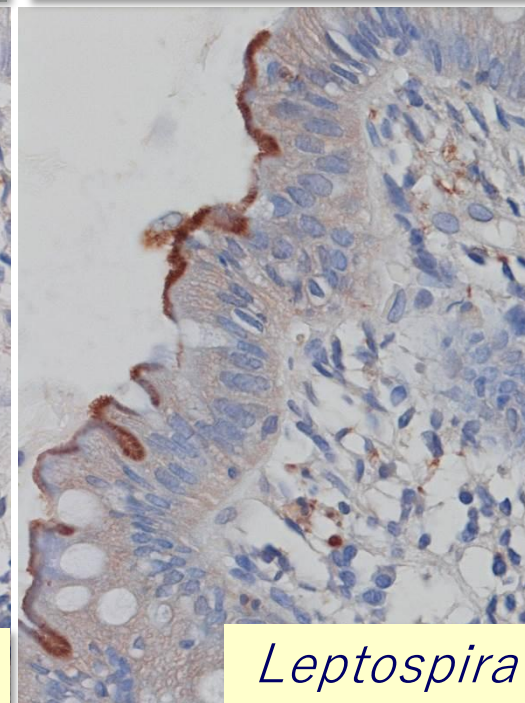
T. Pallidum (mono)



E. coli



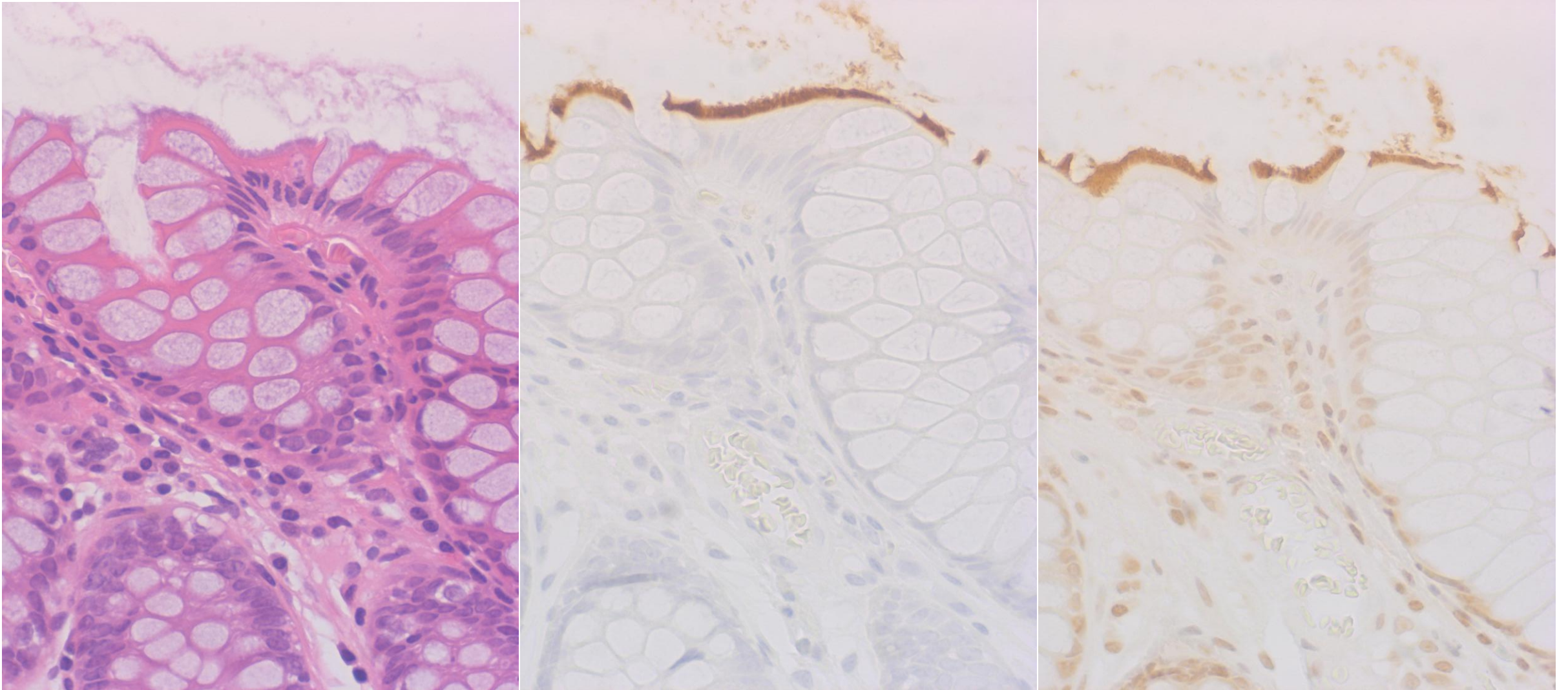
BCG



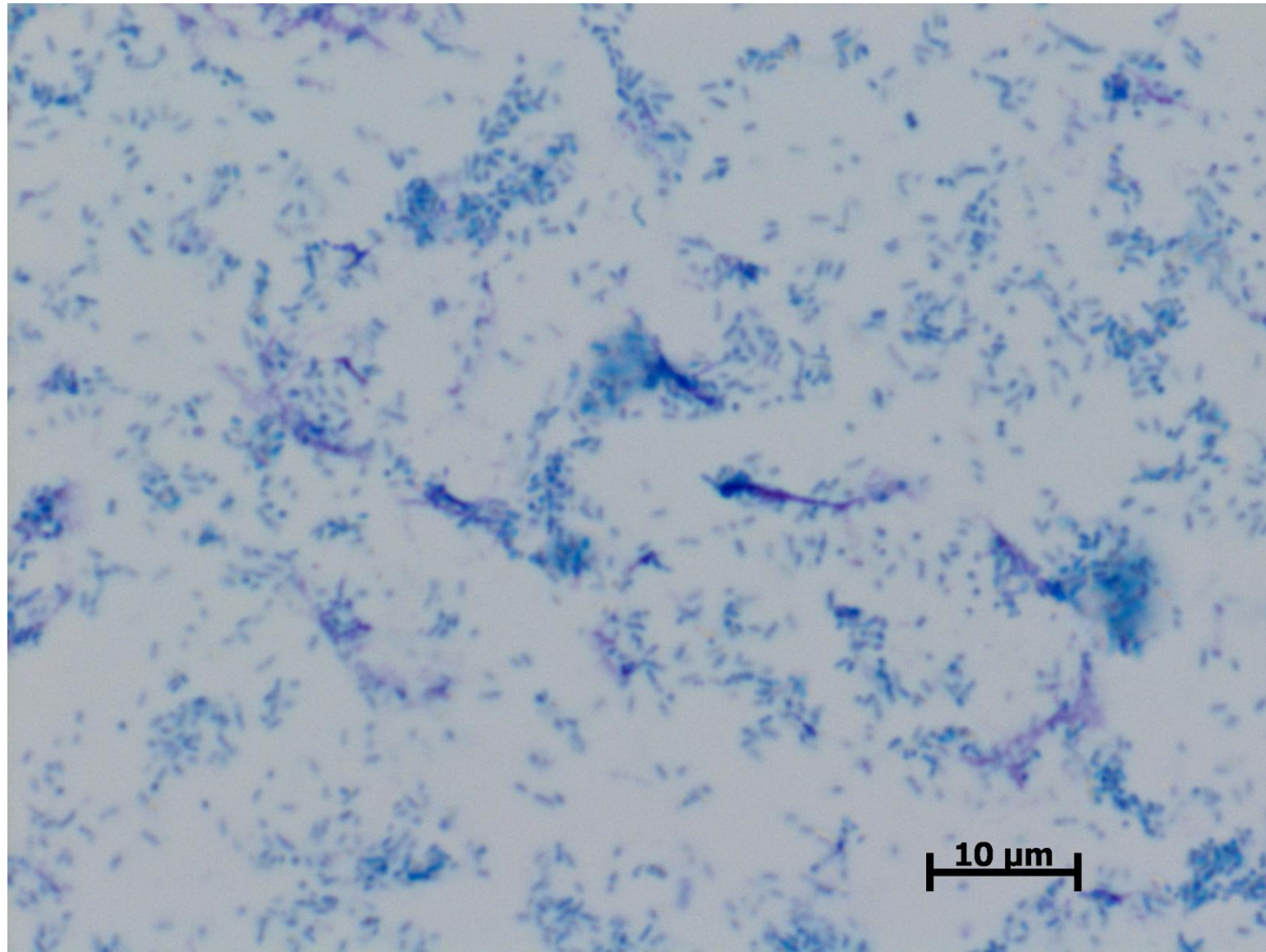
Leptospira

**Intestinal
spirochetosis**
(*Brachyspira
 aalborgi*
infection)

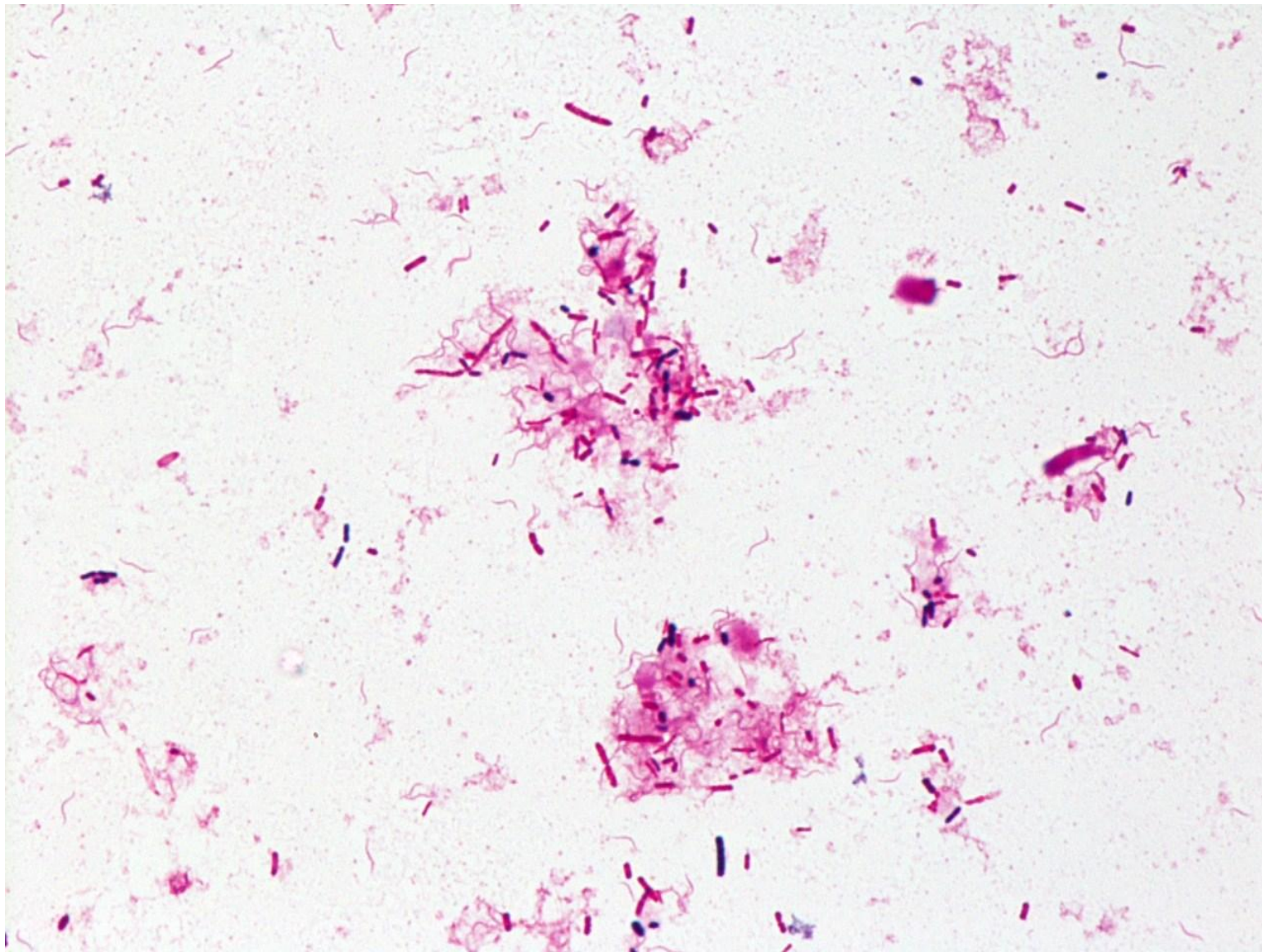
Various anti-
bacteria
antibodies are
cross-reactive to
B. aalborgi.



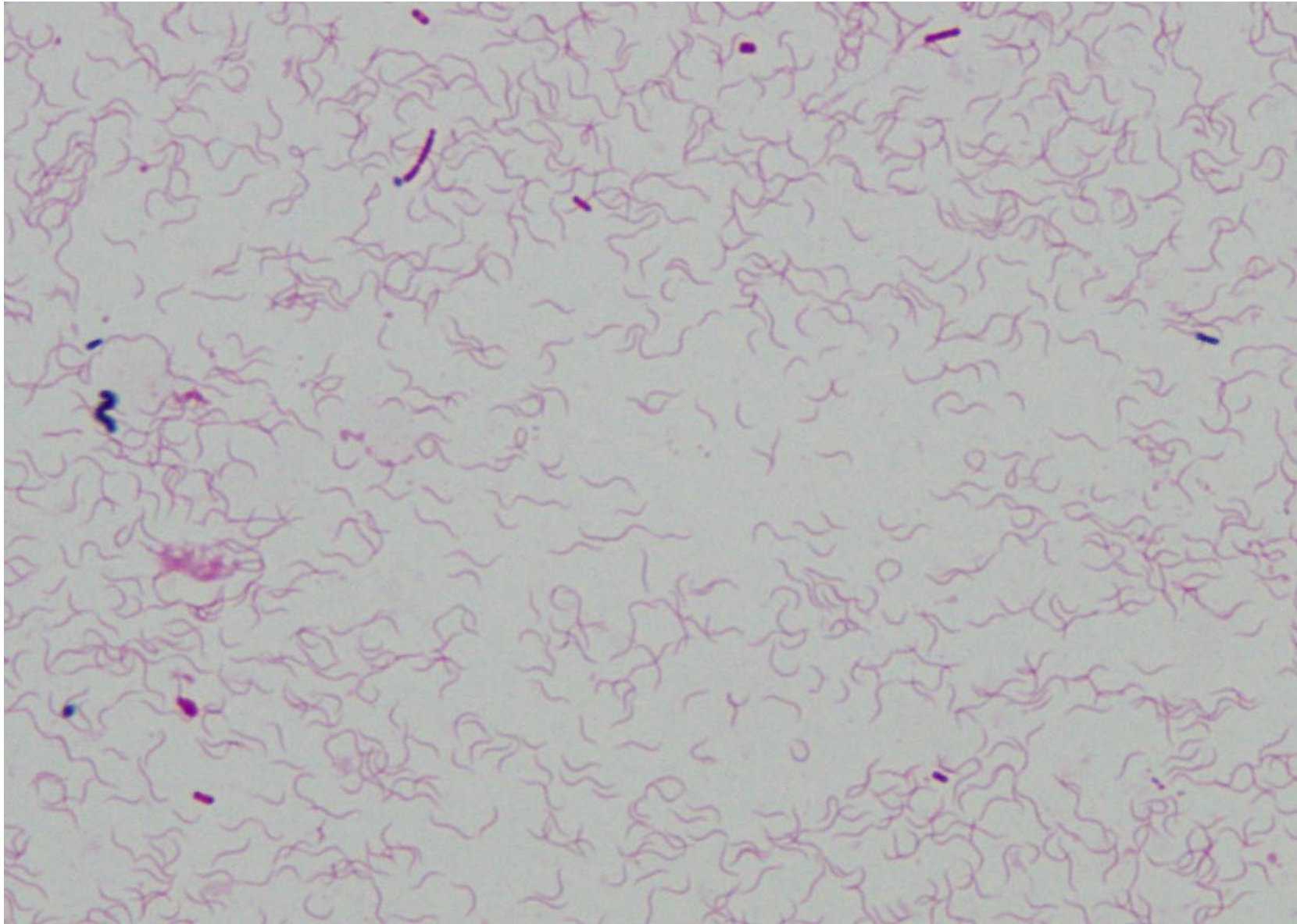
Intestinal spirochetosis in a 66-year-old woman. Left: H&E, center: immunostaining with a monoclonal antibody to *Treponema pallidum*, right: immunostaining with antiserum to *Bacillus cereus*



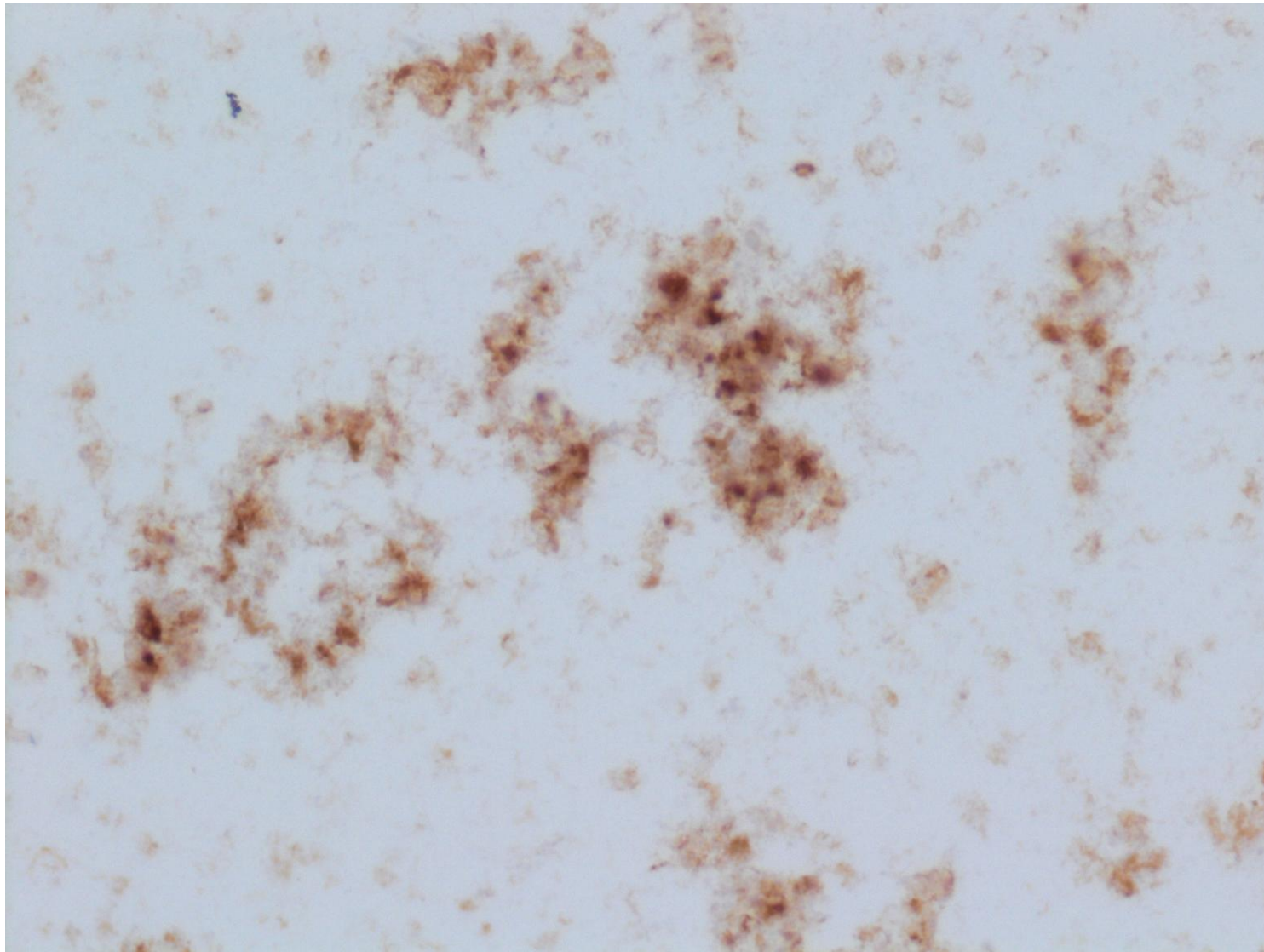
Intestinal spirochetosis. The Giemsa-stained smear preparation from a patient with ulcerative colitis complaining watery diarrhea shows long spiral bacteria, in the background of rods and cocci. Giemsa



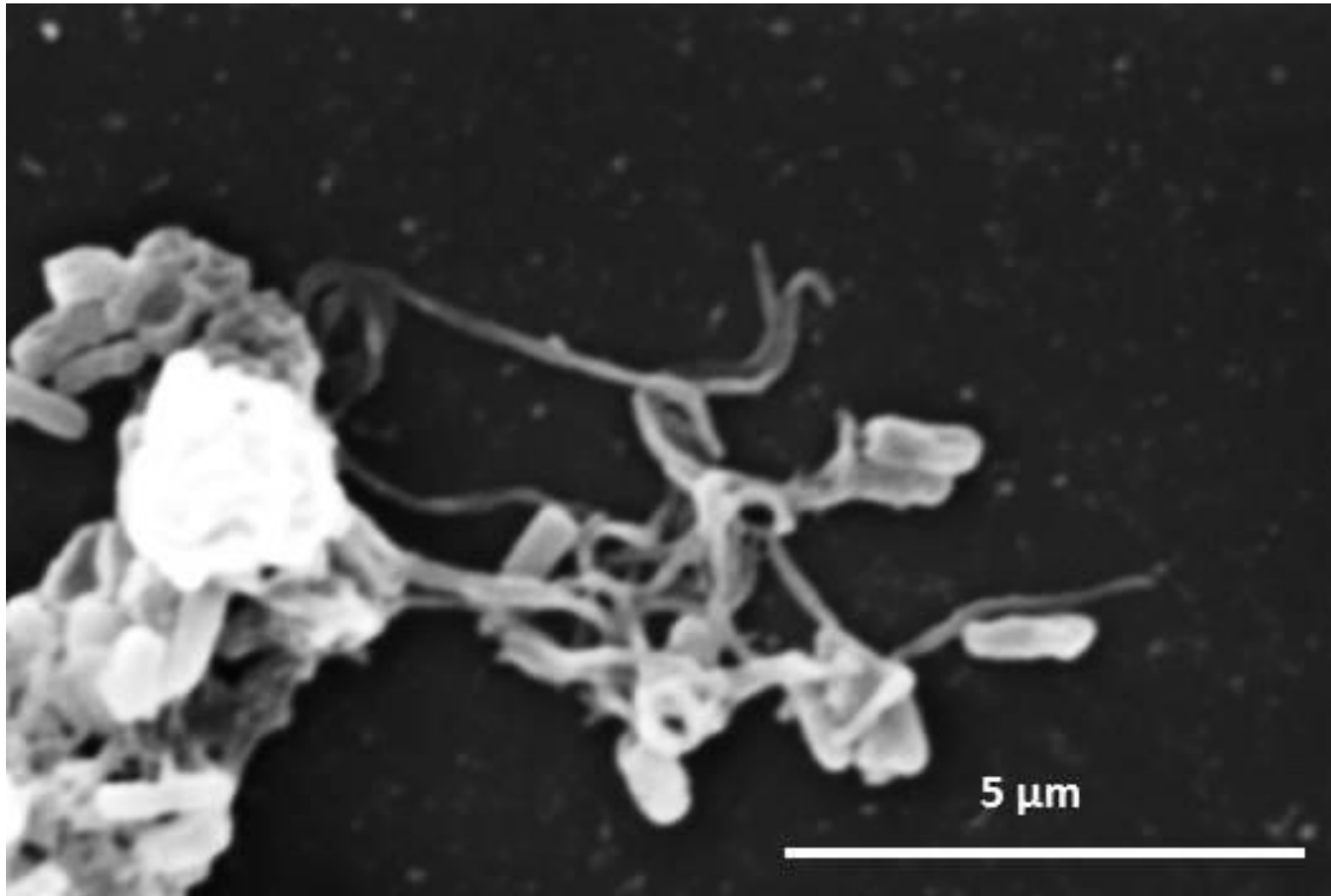
Intestinal spirochetosis. The Gram-stained smear preparation from a patient with ulcerative colitis complaining watery diarrhea shows Gram-negative thin spiral bacteria, in the background of Gram-negative and Gram-positive rods. Gram



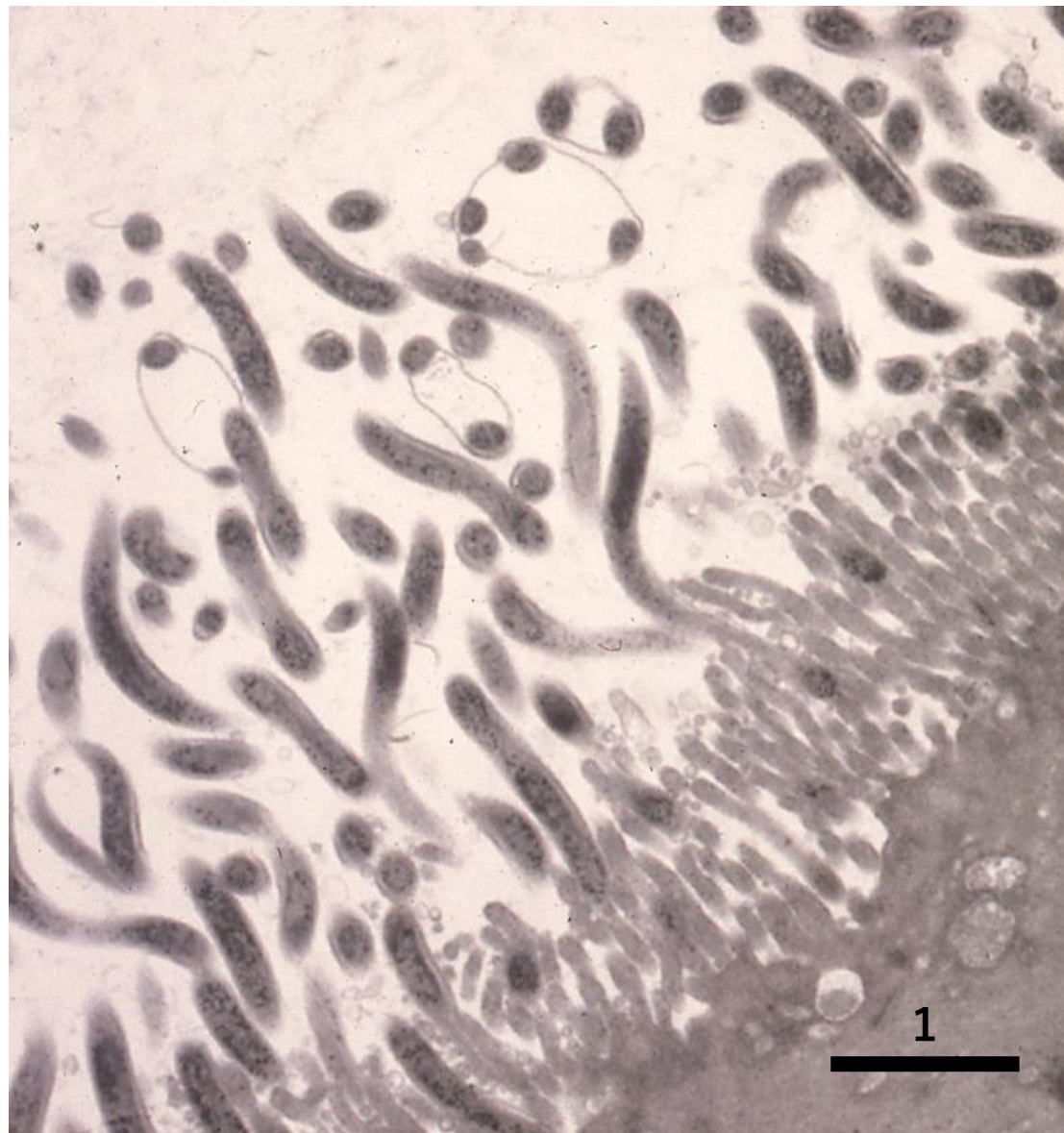
Gram-stained cultured *Brachyspira aalborgi*, a causative pathogen for intestinal spirochetosis.



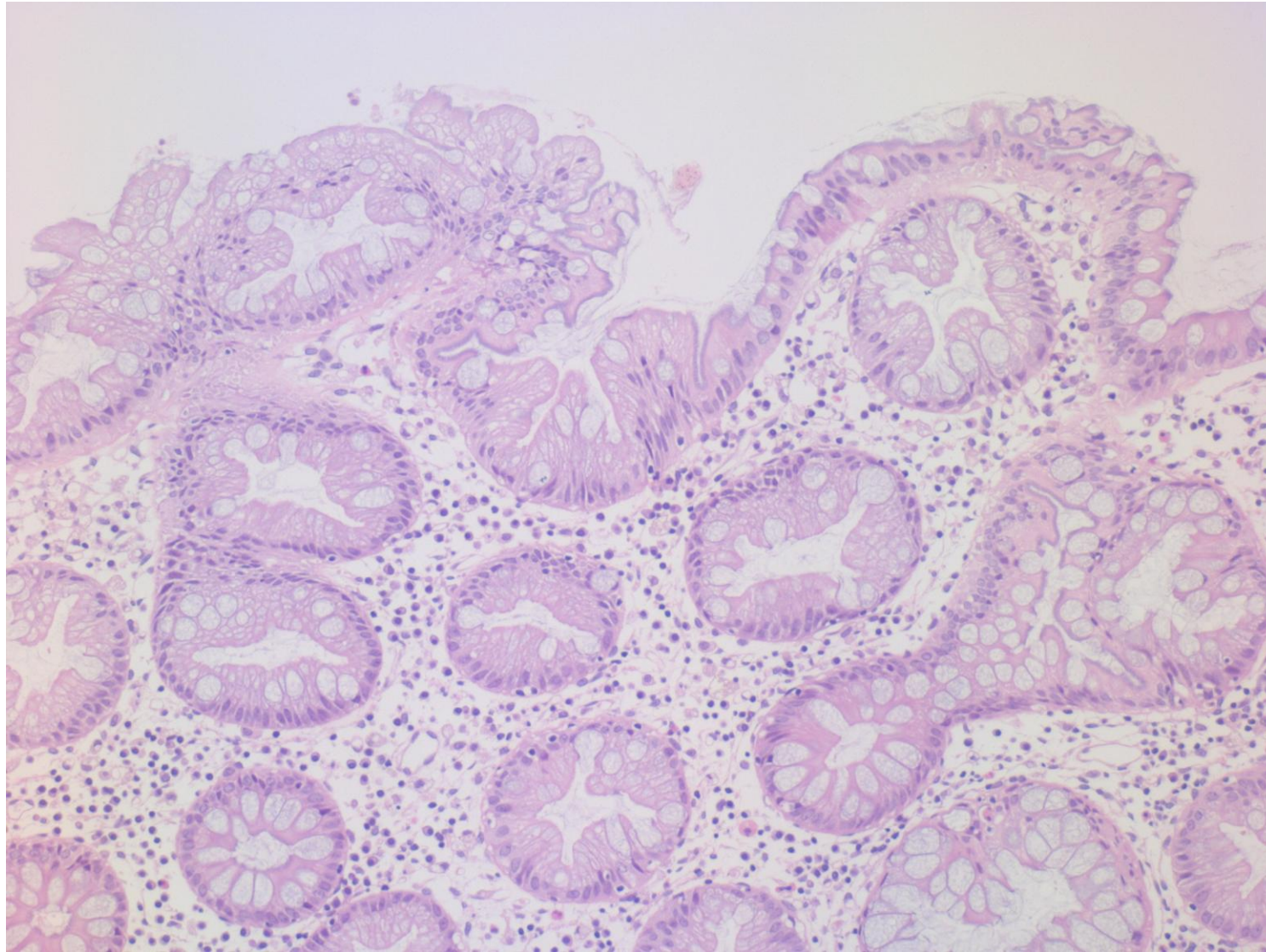
Cultured *Brachyspira aalborgi*, a causative pathogen for intestinal spirochetosis is immunostained with a monoclonal antibody to *Treponema pallidum*.



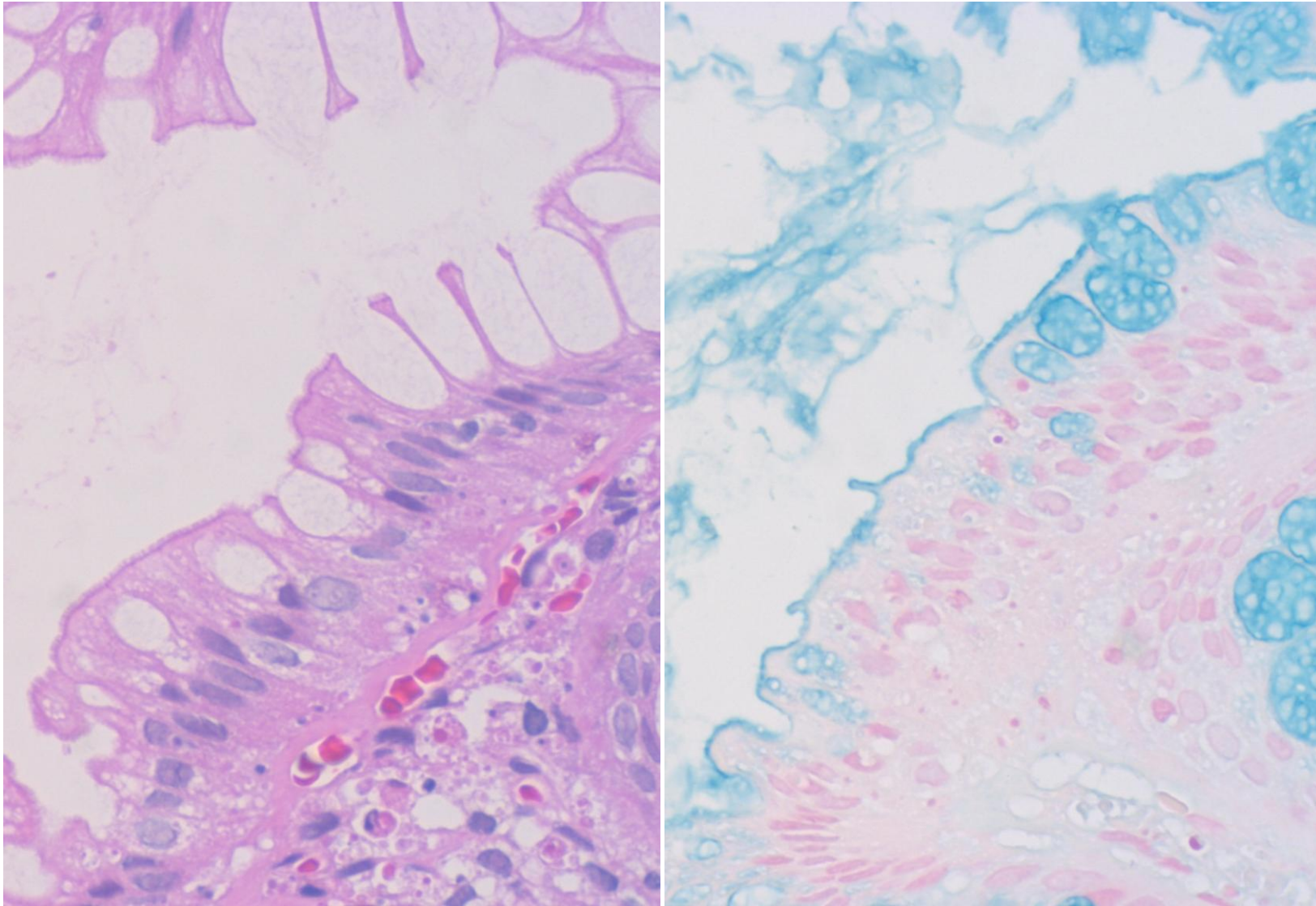
Scanning electron micrograph of *Brachyspira aalborgi* in diarrheal fluid. Mildly coiled spiral spirochaetae are demonstrated.



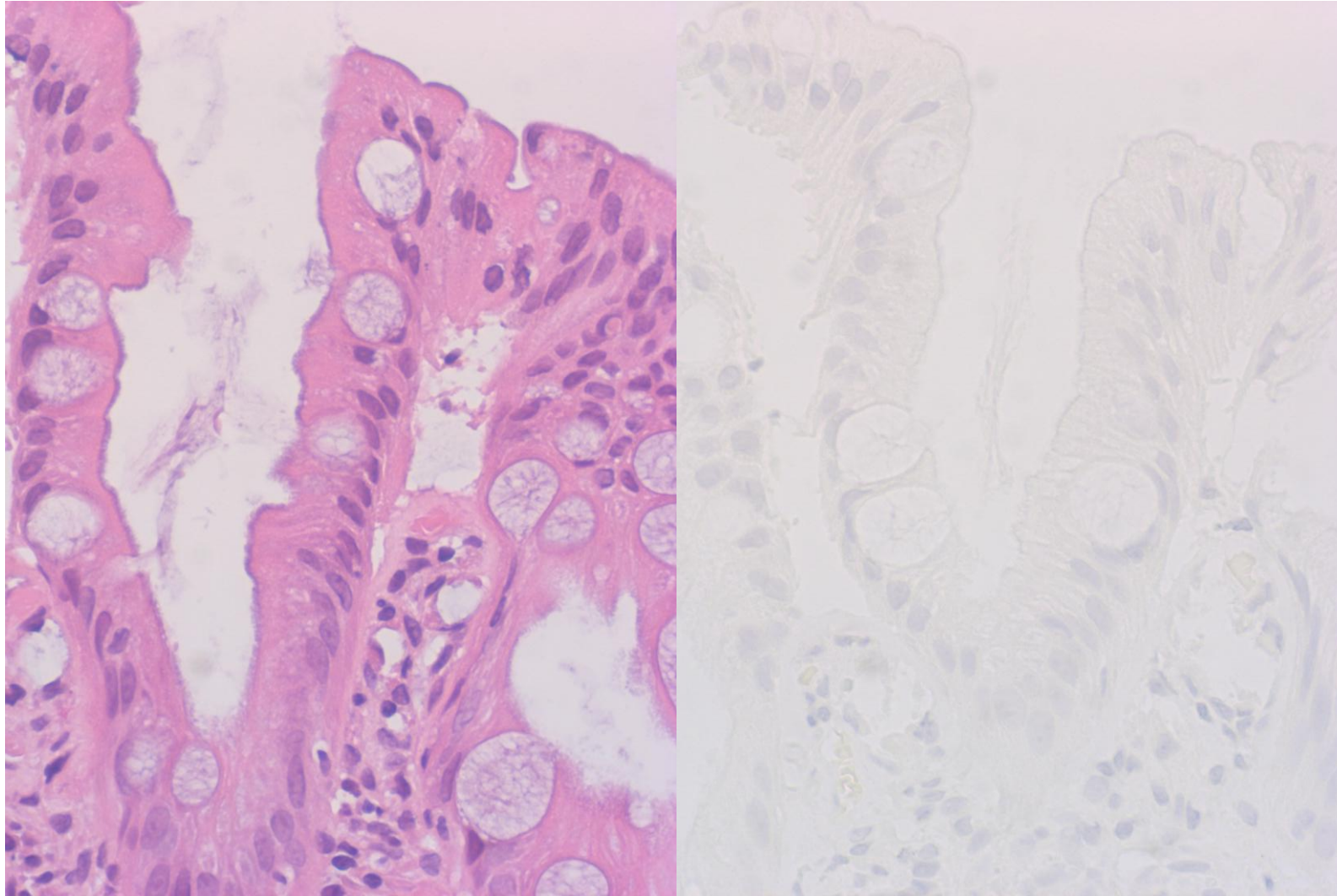
Transmission electron micrograph of *Brachyspira aalborgi* attached onto the colonic surface columnar epithelial cells. Mildly coiled spiral spirochaetae are densely infected on the microvilli. EM



Intestinal spirochetosis observed on the surface of the serrated columnar cells (a 59-year-old man). A polypectomized specimen of metaplastic polyp of the colon. H&E



Normal brush border of the colonic mucosa in a 30-year-old man. The accentuated brush borders are somewhat confusing with intestinal spirochetosis. The brush border is alcianophilic. Left: H&E, right: Alcian blue staining



Normal brush border of the colonic mucosa in a 76-year-old man. The accentuated brush borders (left: H&E) are somewhat confusing with intestinal spirochetosis. The brush border is negative with monoclonal antibody to *Treponema pallidum* (right).