

Blastocystis hominis

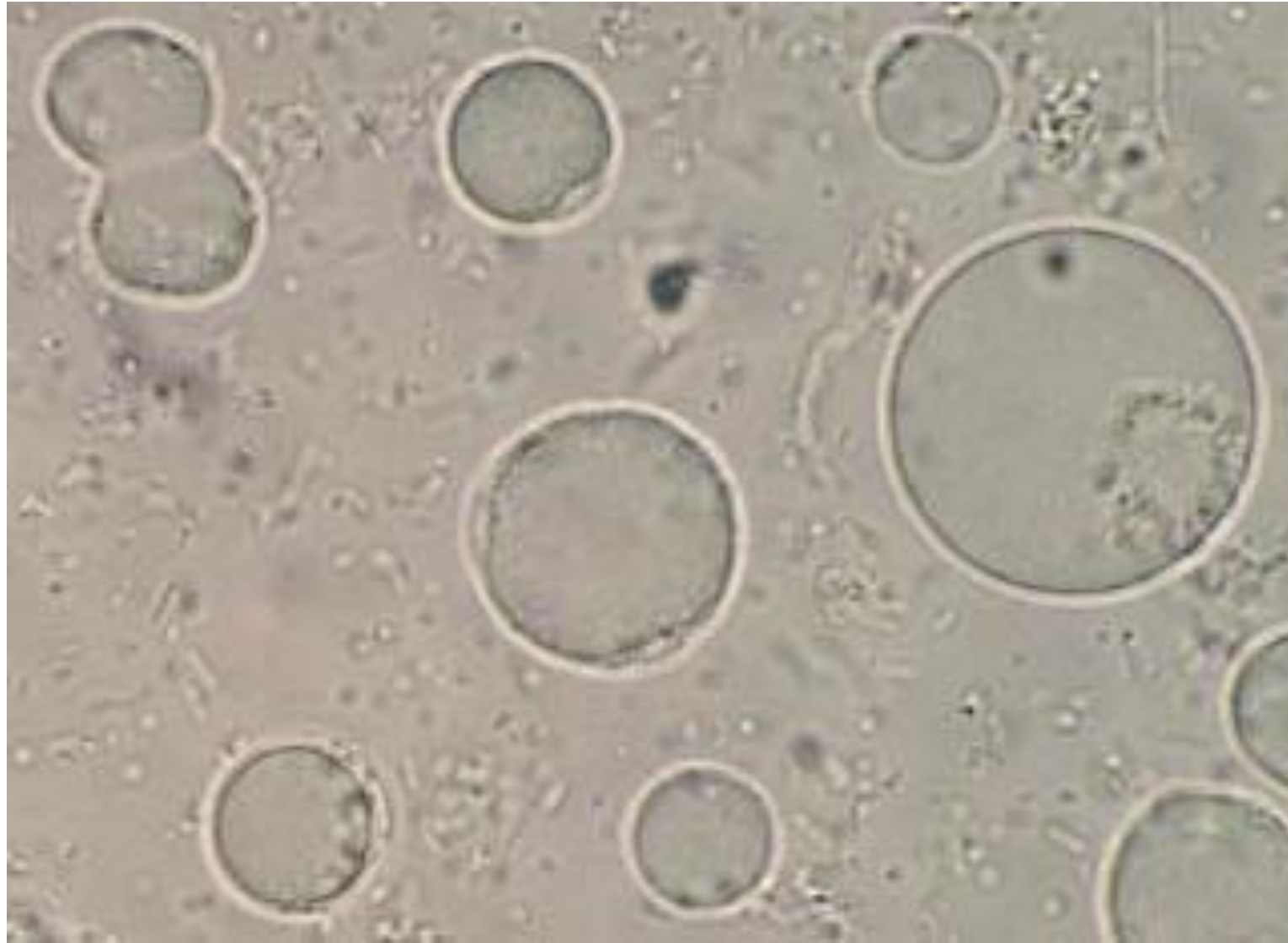
Blastocystis hominis is a globular unicellular pathogen, 8-32 µm in size, containing a large vacuole within the cell. The nucleus and cytoplasm are seen at the periphery. It divides by binary fission. The taxonomy remains unsolved. The pathogenesis of *B. hominis* to the human is also unsettled, since it is detectable in the feces of normal individuals. Of note is that *B. hominis* is obligatory anaerobic, but it contains mitochondria. What is the role of mitochondria in this enigmatic organism?

It has been investigated that the change in microbiota plays an important role in the pathogenesis of ulcerative colitis. *Blastocystis hominis* may have some roles among intestinal organisms, since *Blastocystis* colonization alters the gut microbiome.

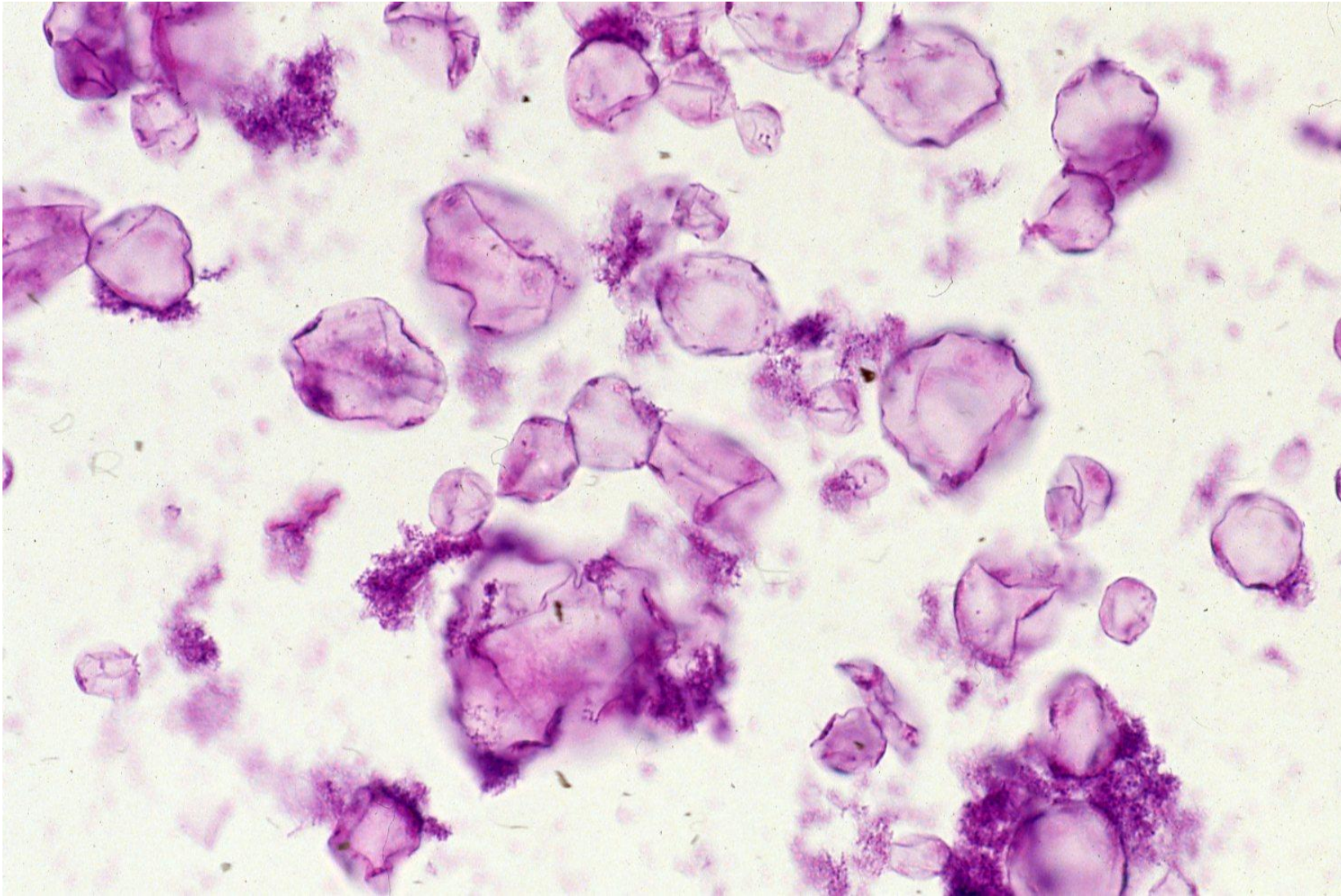
Ref.-1: Parija SC, Jeremiah S. Blastocystis: taxonomy, biology and virulence. Trop Parasitol 2013; 3(1): 17-25. doi: 10.4103/2229-5070.113894

Ref.-2: Kaneda Y, et al. Serologic response to Blastocystis hominis infection in asymptomatic individuals. Tokai J Exp Clin Med 2000; 25(2): 51-56. PMID: 11127507

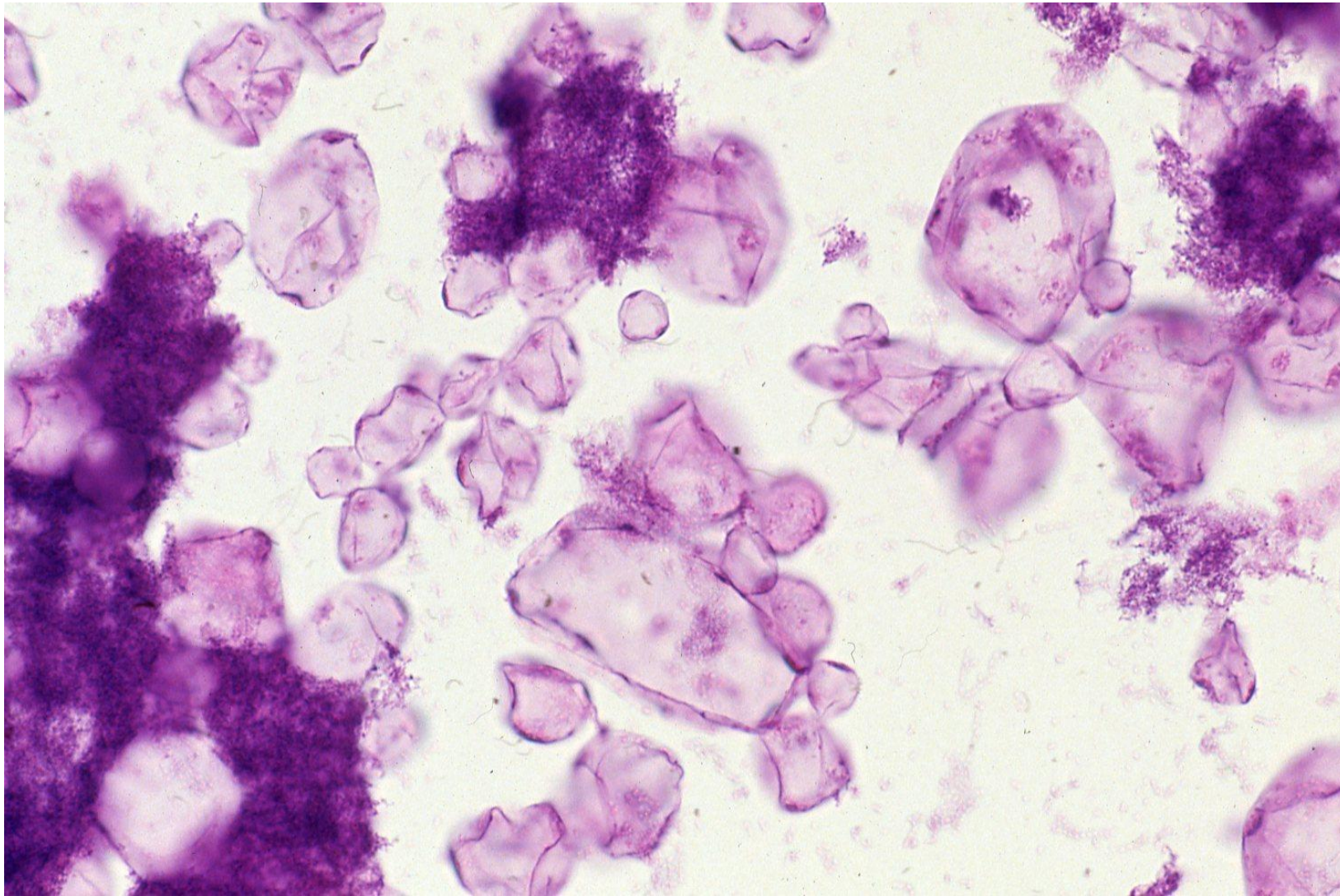
Ref.-3: Kök M, et al. The role of *Blastocystis hominis* in the activation of ulcerative colitis. Turk J Gastroenterol 2019; 30(1): 40-46. doi: 10.5152/tjg.2018.18498



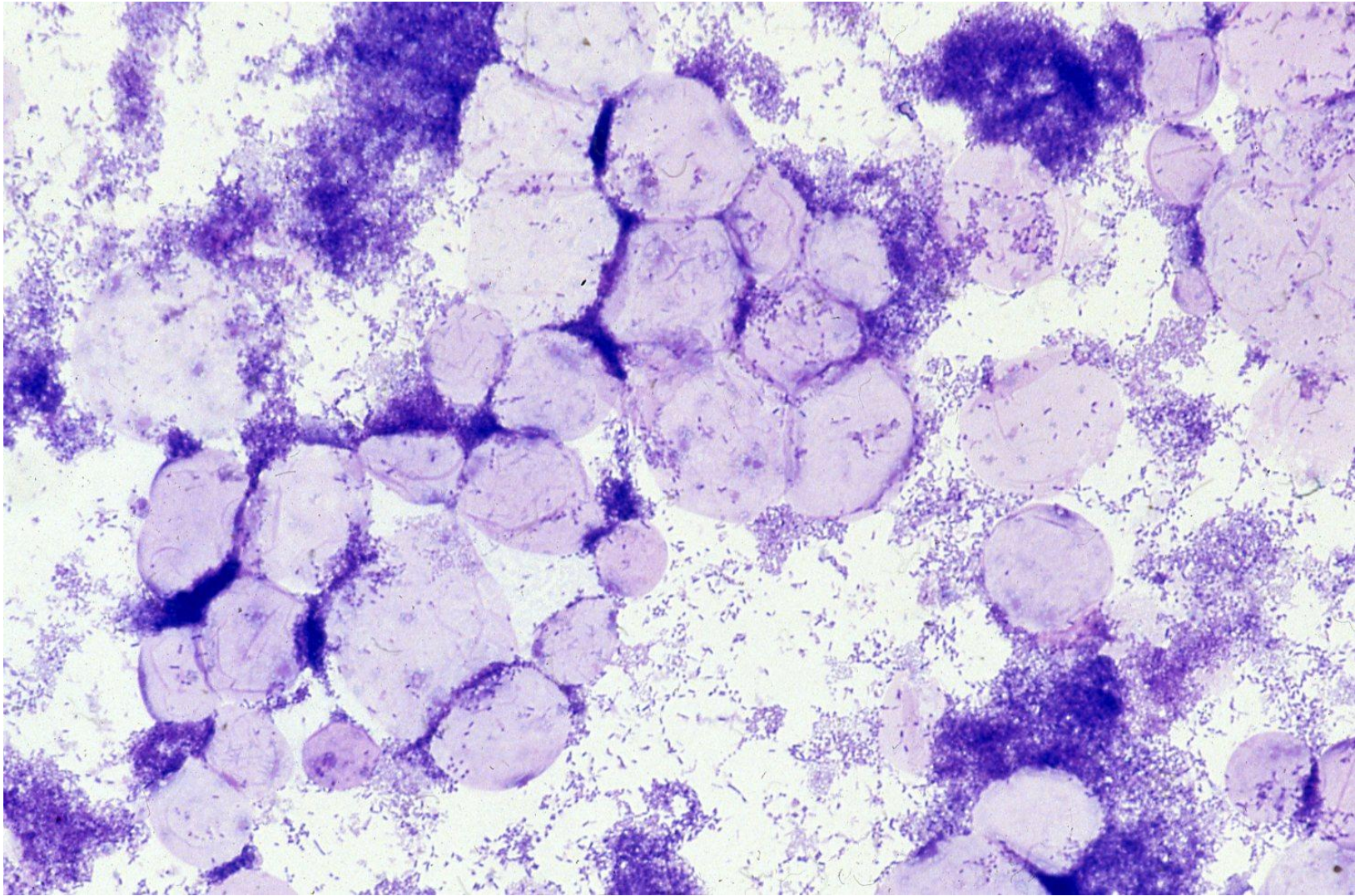
Cultured *Blastocystis hominis*. Unstained preparation



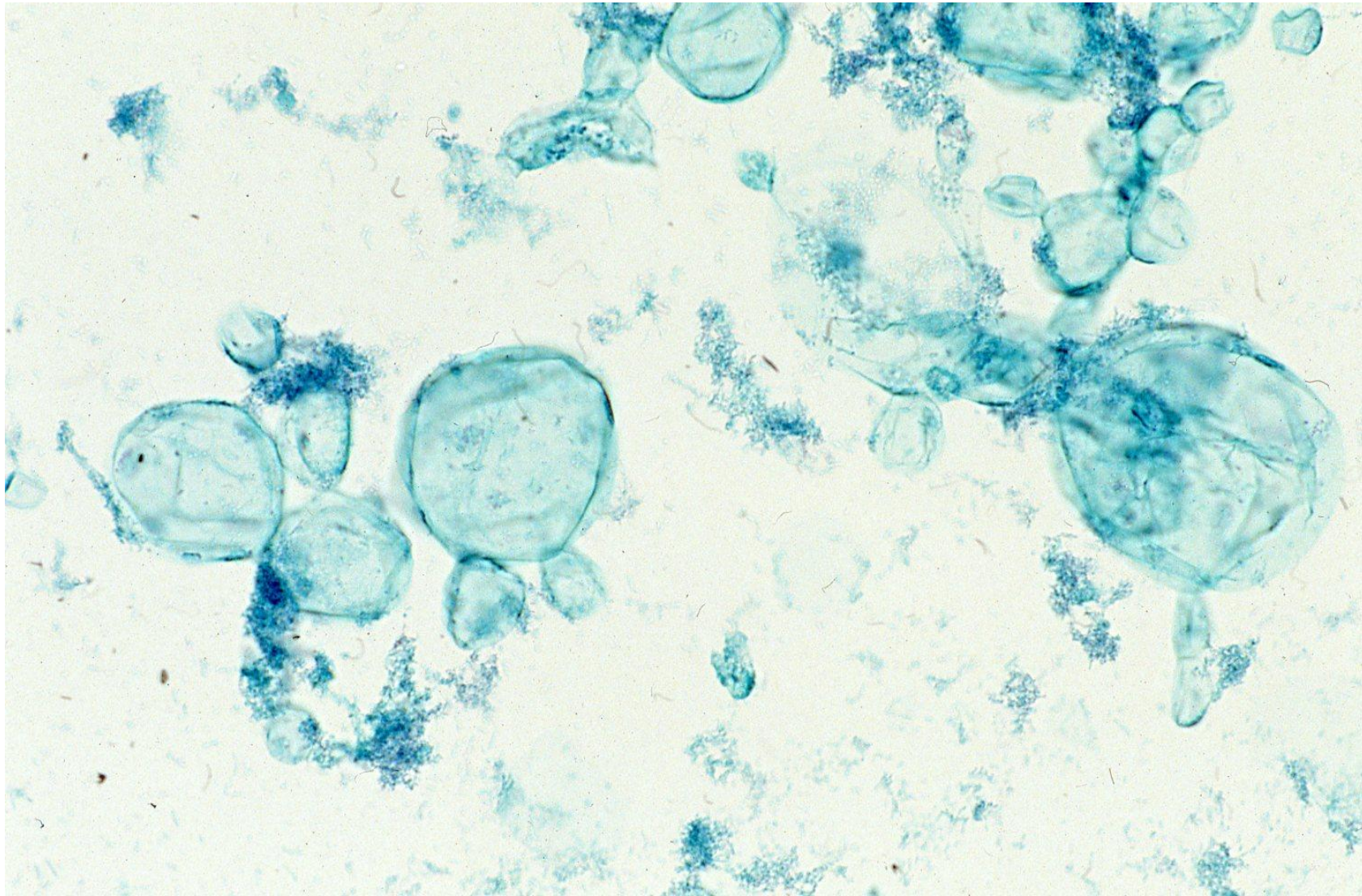
Cultured *Blastocystis hominis*. Size variation is noteworthy. The nucleus is located at the periphery of the cystic pathogen. Co-cultured *E. coli* are seen in the background. H&E-1



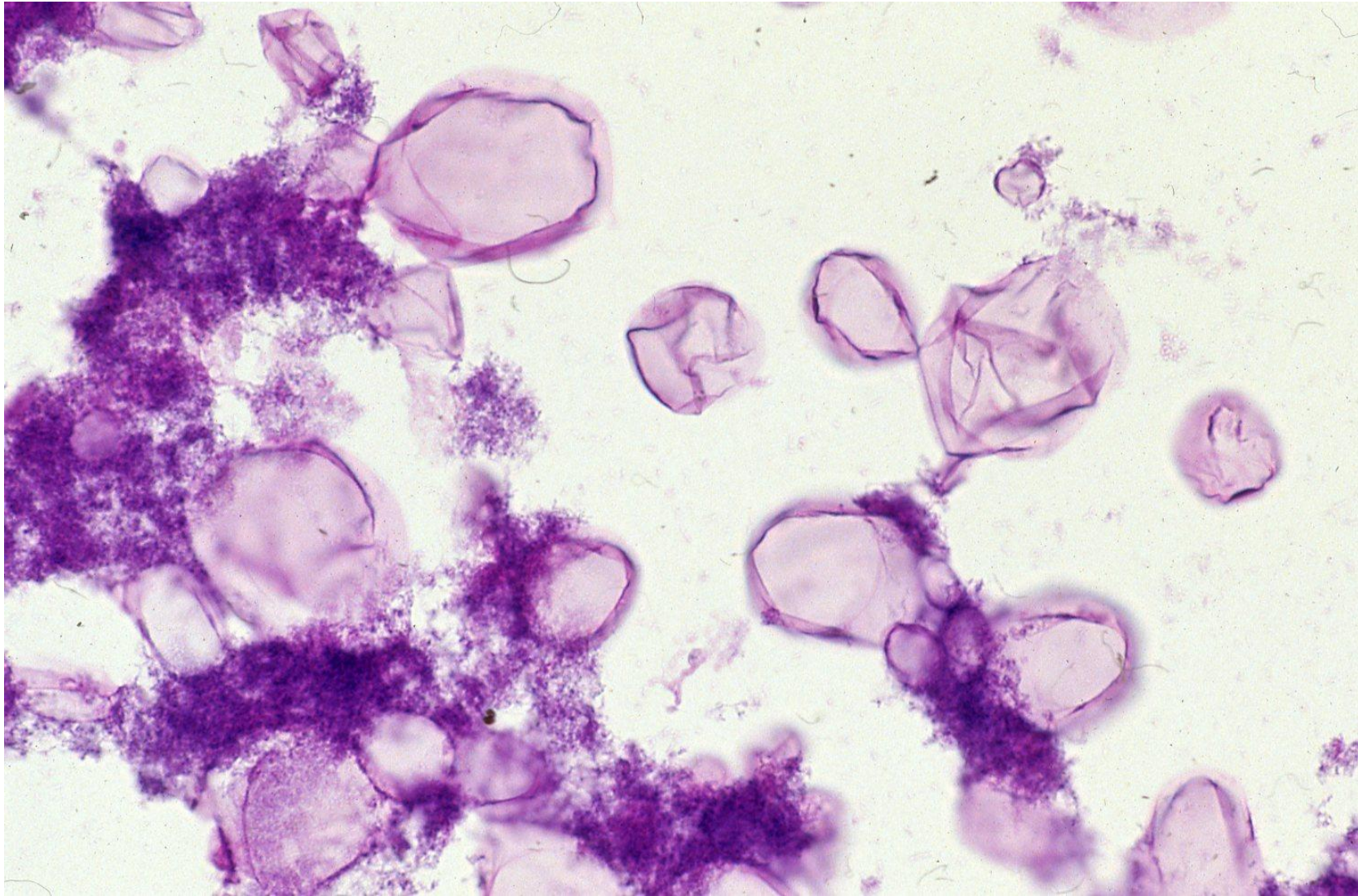
Cultured *Blastocystis hominis*. Size variation is noteworthy. The nucleus is located at the periphery of the cystic pathogen. Co-cultured *E. coli* are seen in the background. H&E-2



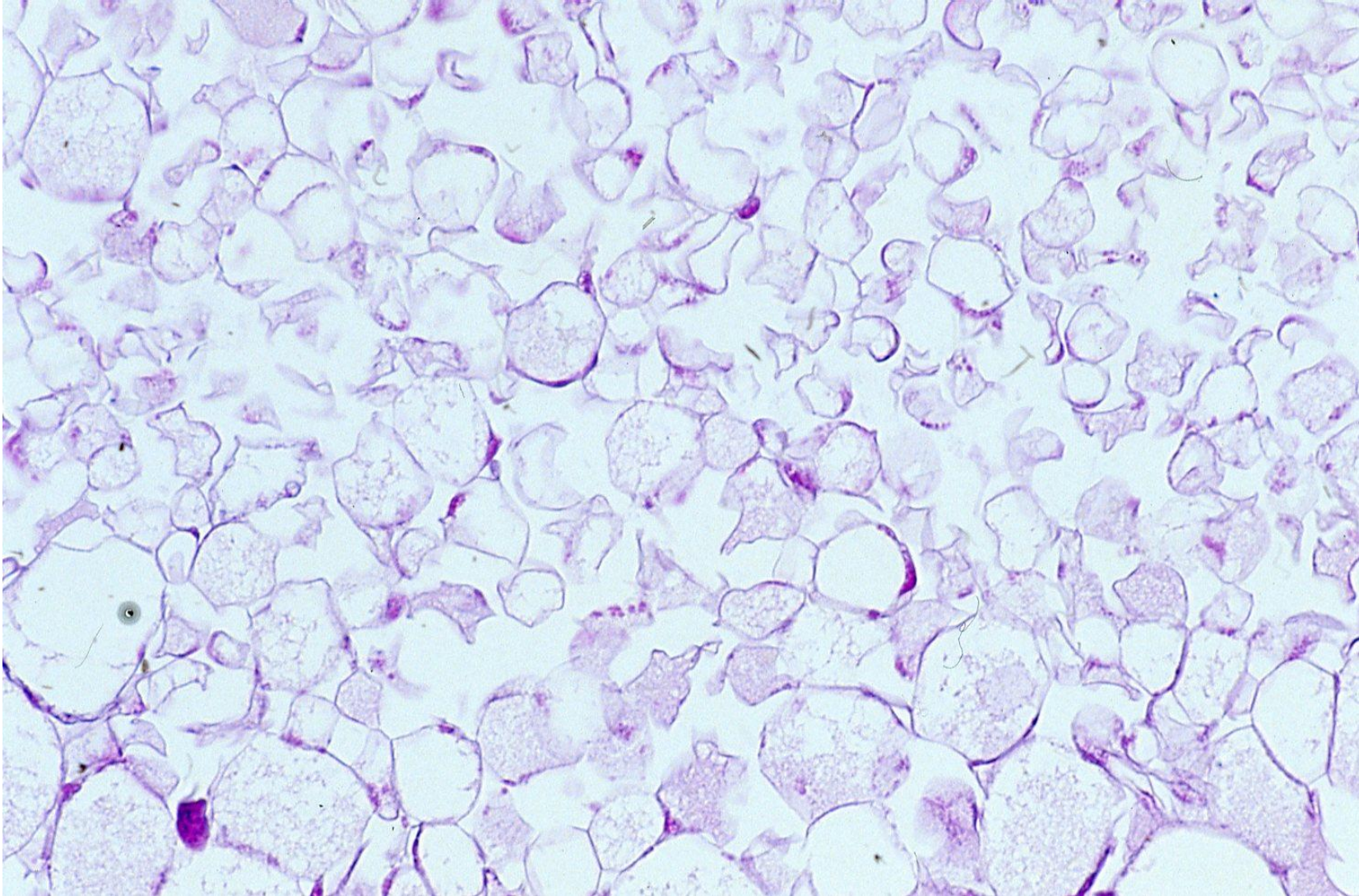
Cultured *Blastocystis hominis*. Size variation is noteworthy. The nucleus is located at the periphery of the cystic pathogen. Co-cultured *E. coli* are seen in the background. Giemsa



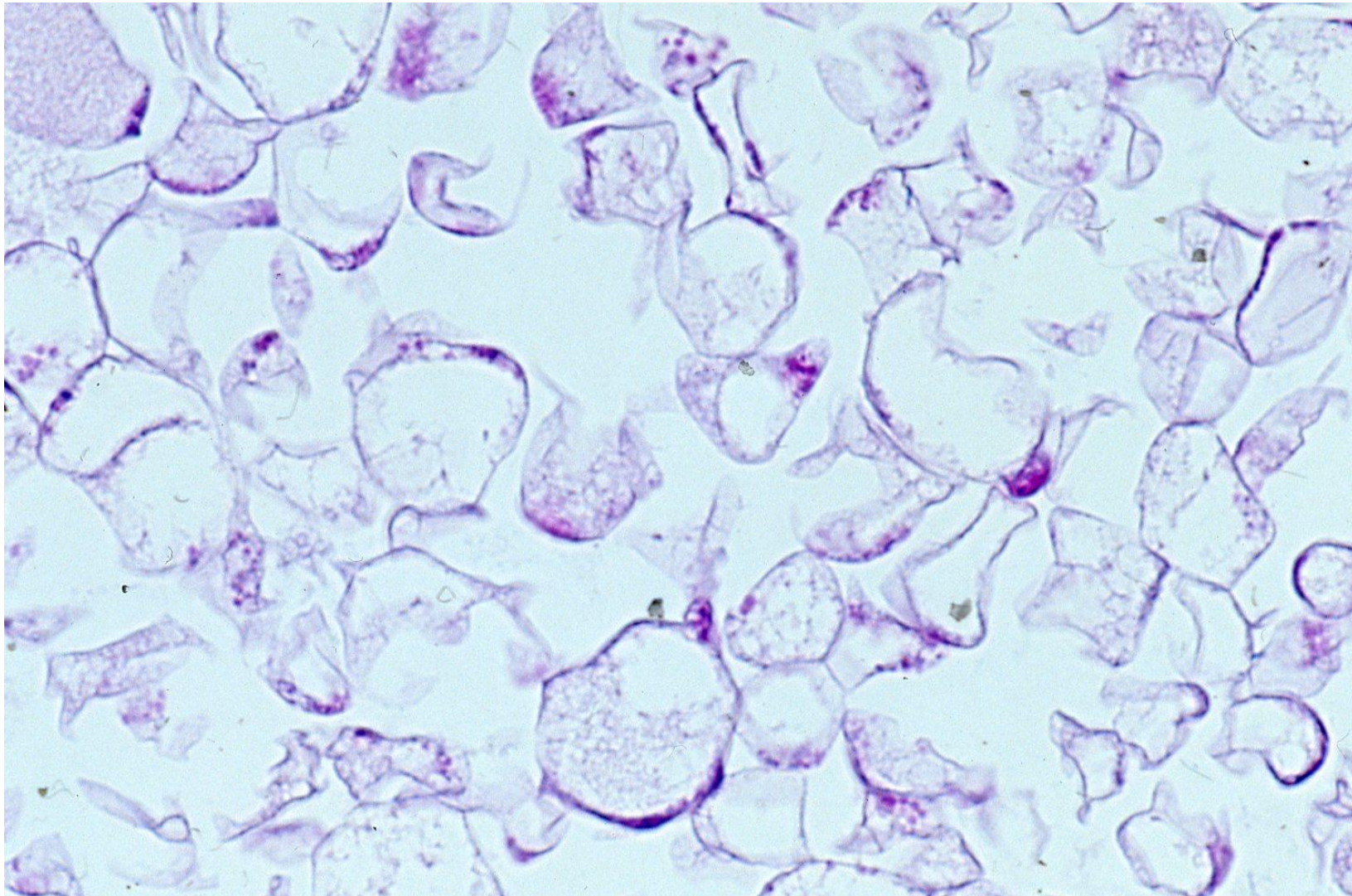
Cultured *Blastocystis hominis*. Size variation is noteworthy. The nucleus is located at the periphery of the cystic pathogen. Co-cultured *E. coli* are seen in the background. Papanicolaou



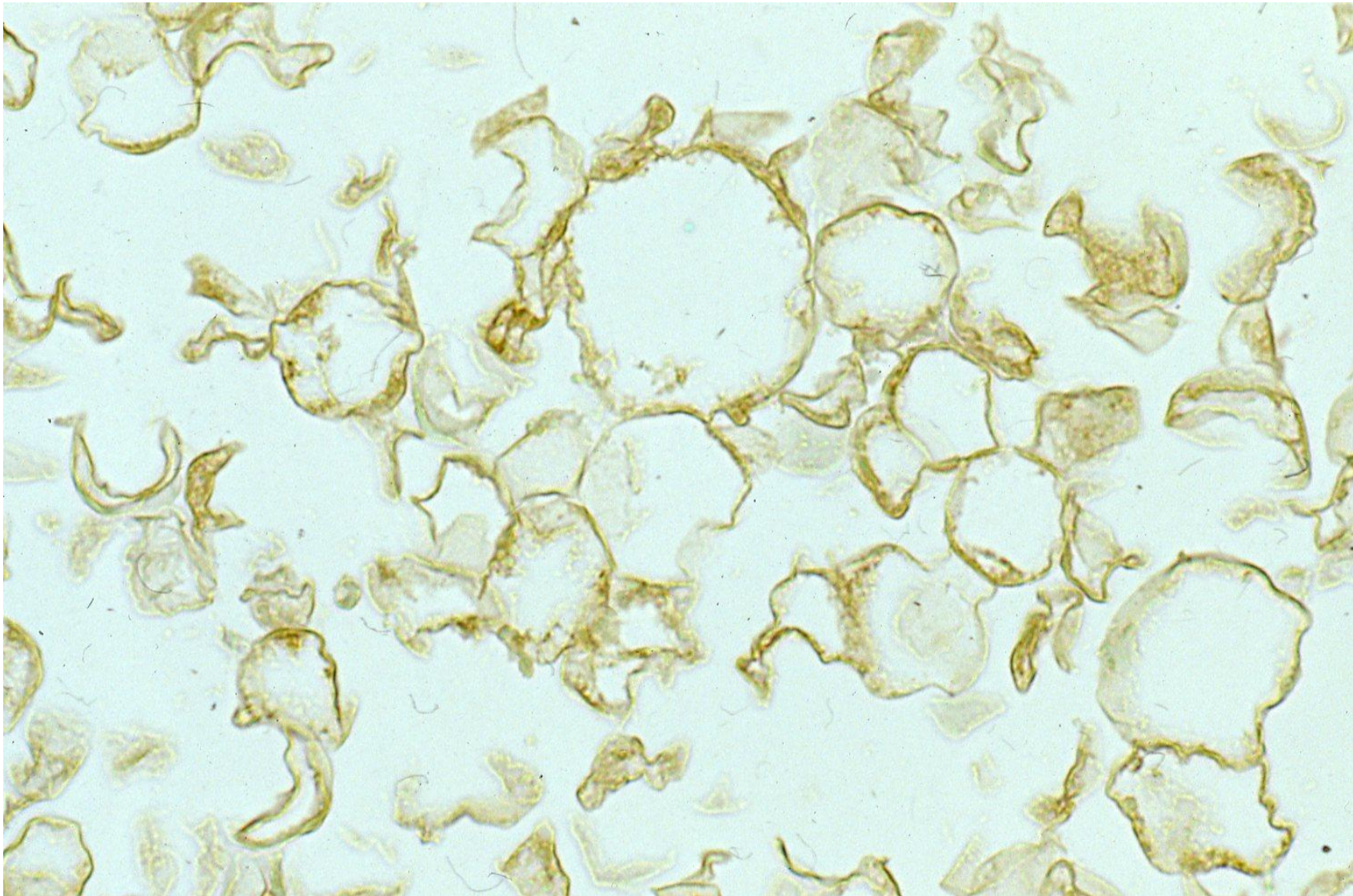
Cultured *Blastocystis hominis*. Size variation is noteworthy. The cell membrane of the cystic pathogen is PAS reactive. Co-cultured *E. coli* are also PAS-reactive. PAS



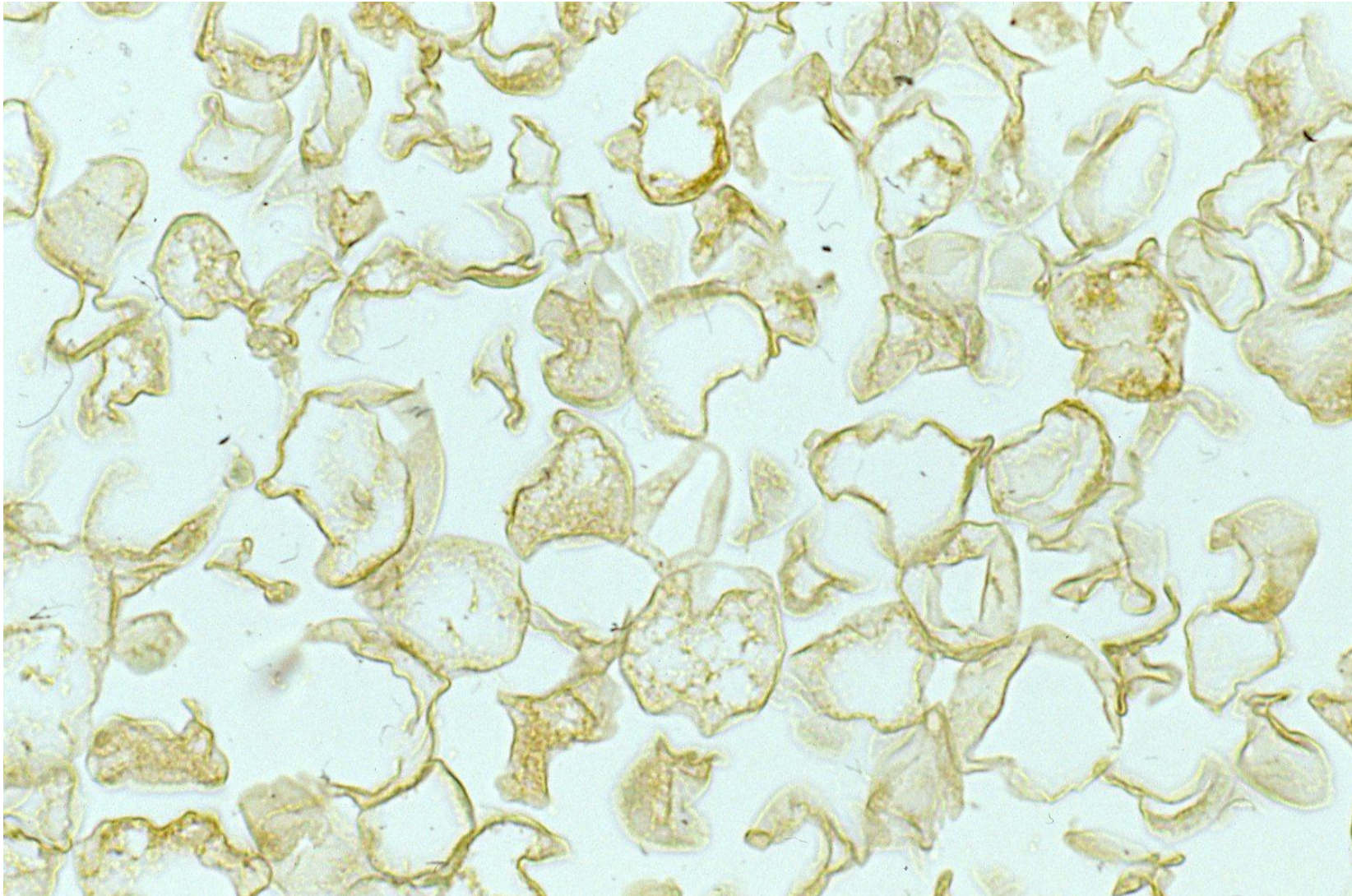
Cell block preparation of the cultured *Blastocystis hominis*. Size variation is noteworthy. The nucleus is located at the periphery of the cystic pathogen. H&E-a



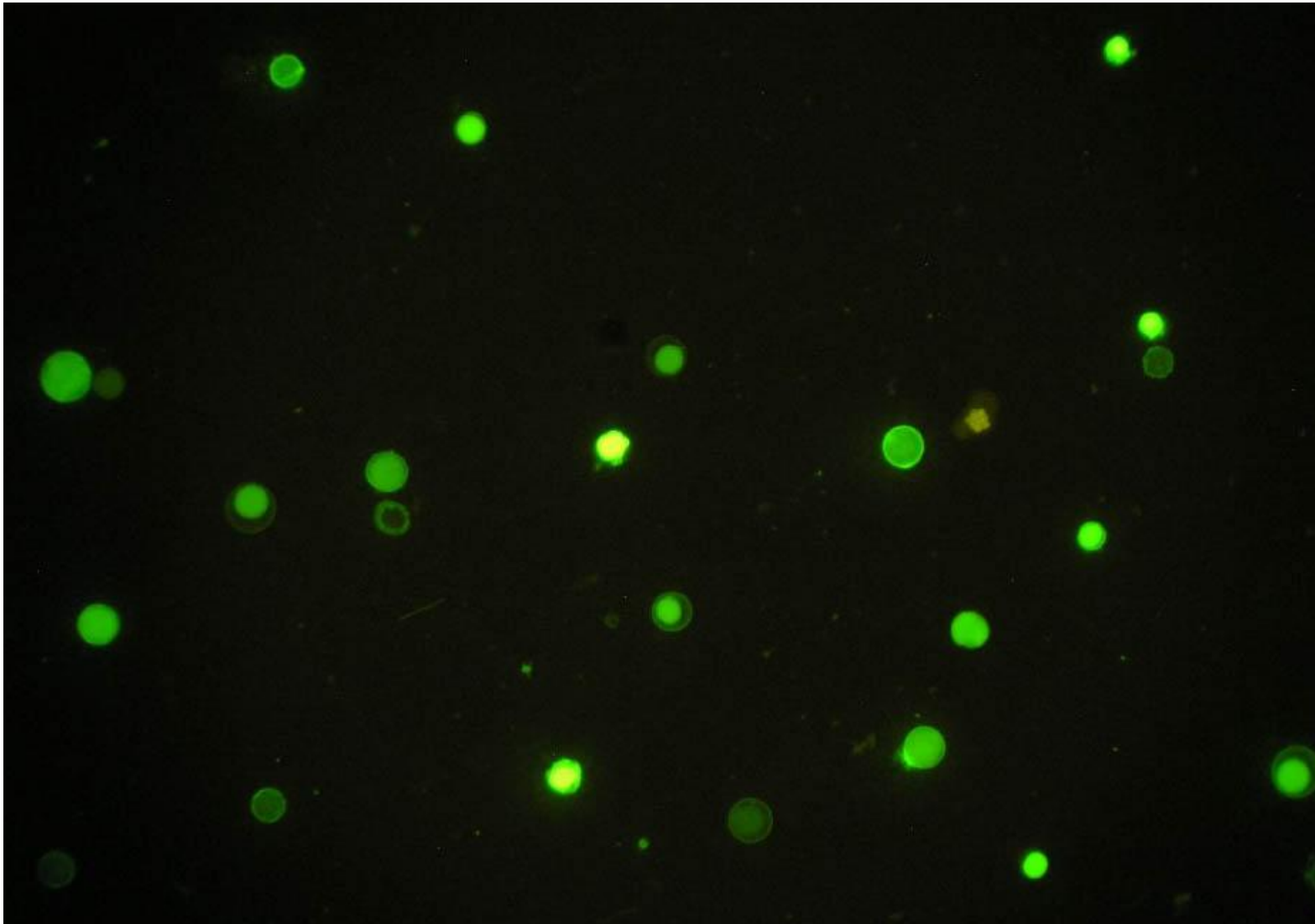
Cell block preparation of the cultured *Blastocystis hominis*. Size variation is noteworthy. The nucleus is located at the periphery of the cystic pathogen. H&E-b



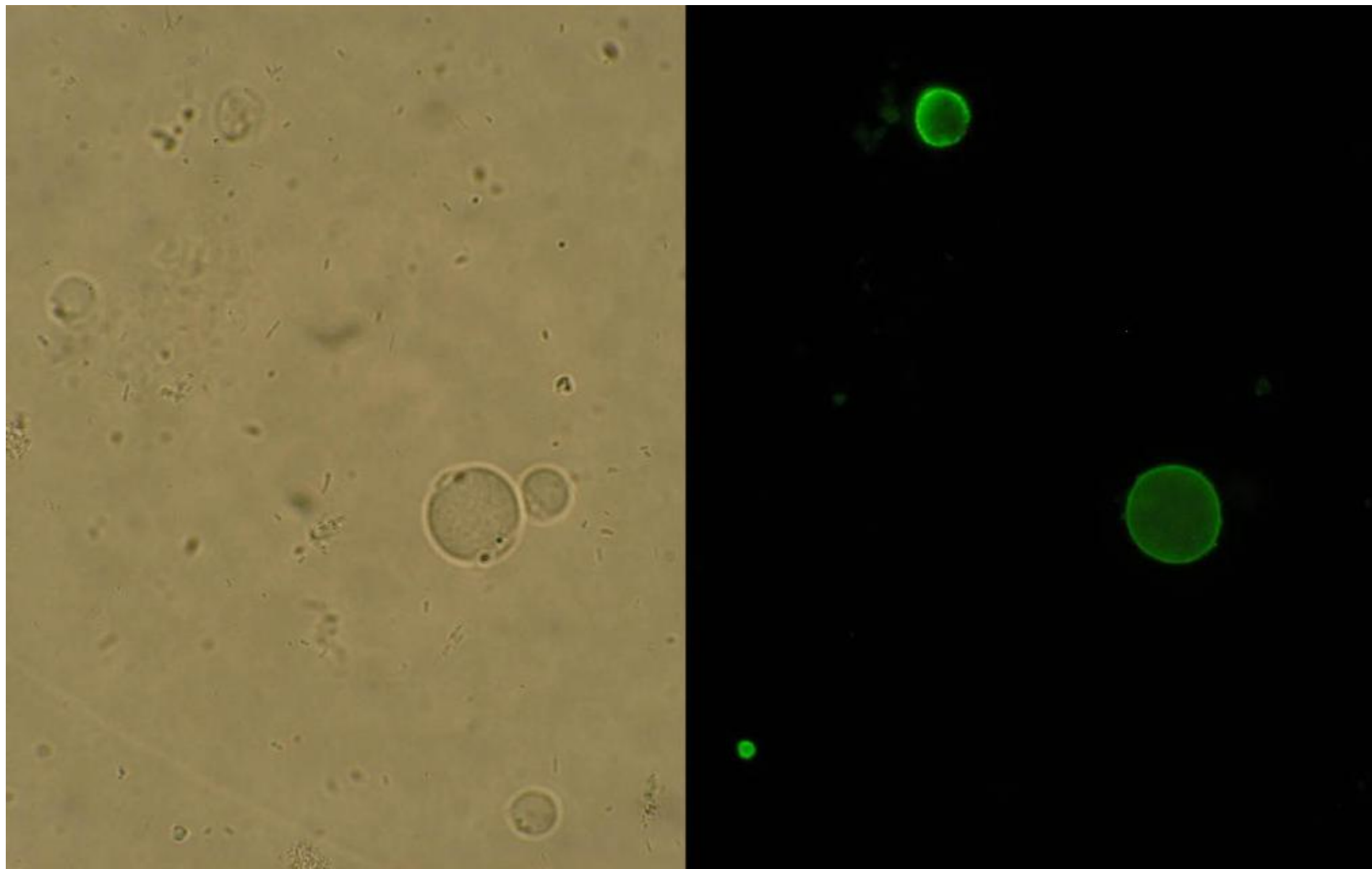
Cell block preparation of the cultured *Blastocystis hominis*. Immunostaining with diluted patient's serum decorates plasma membrane of the cystic pathogen. Immunostaining using the diluted patient's serum-1



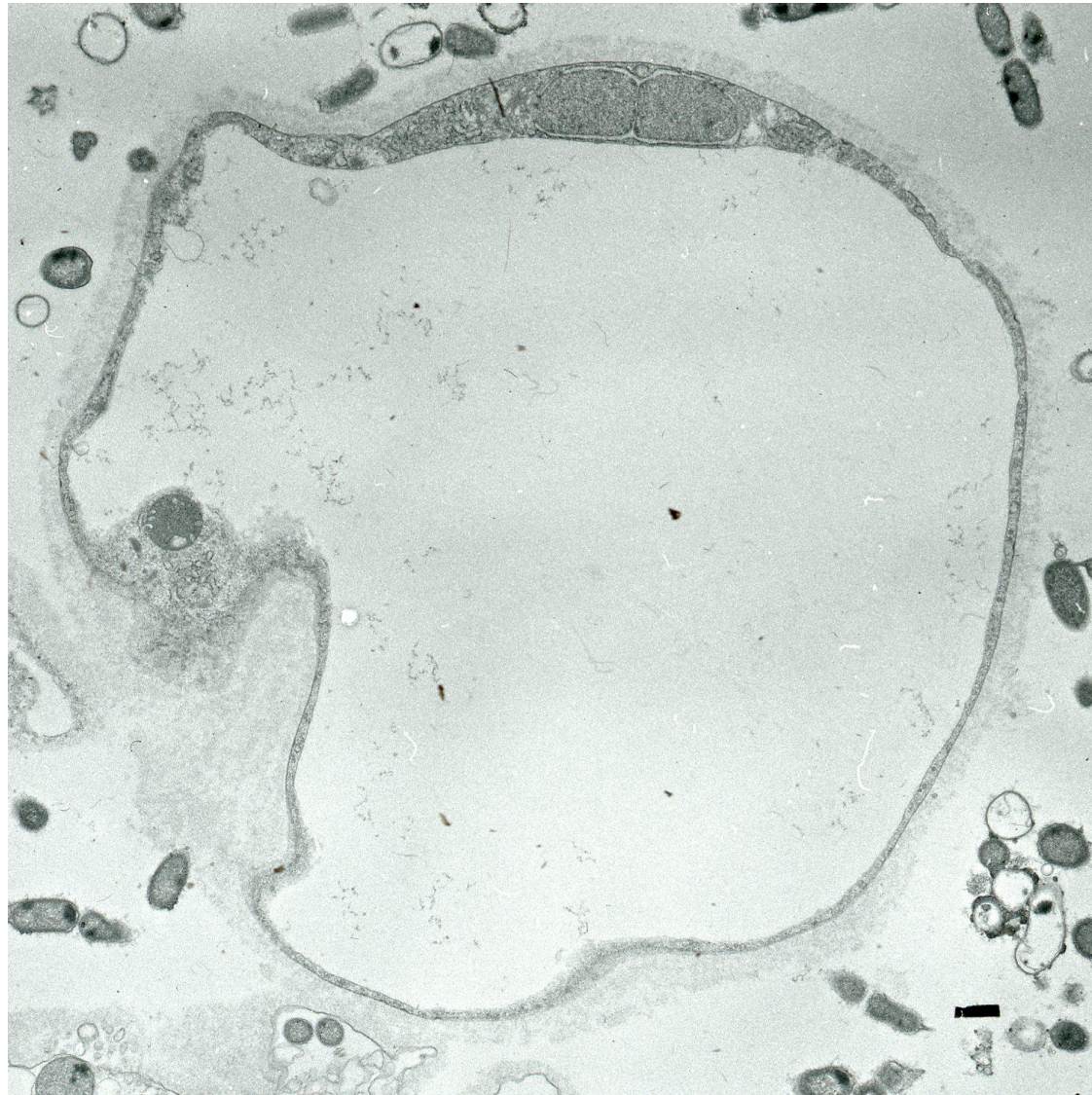
Cell block preparation of the cultured *Blastocystis hominis*. Immunostaining with diluted patient's serum decorates plasma membrane of the cystic pathogen. Immunostaining using the diluted patient's serum-2



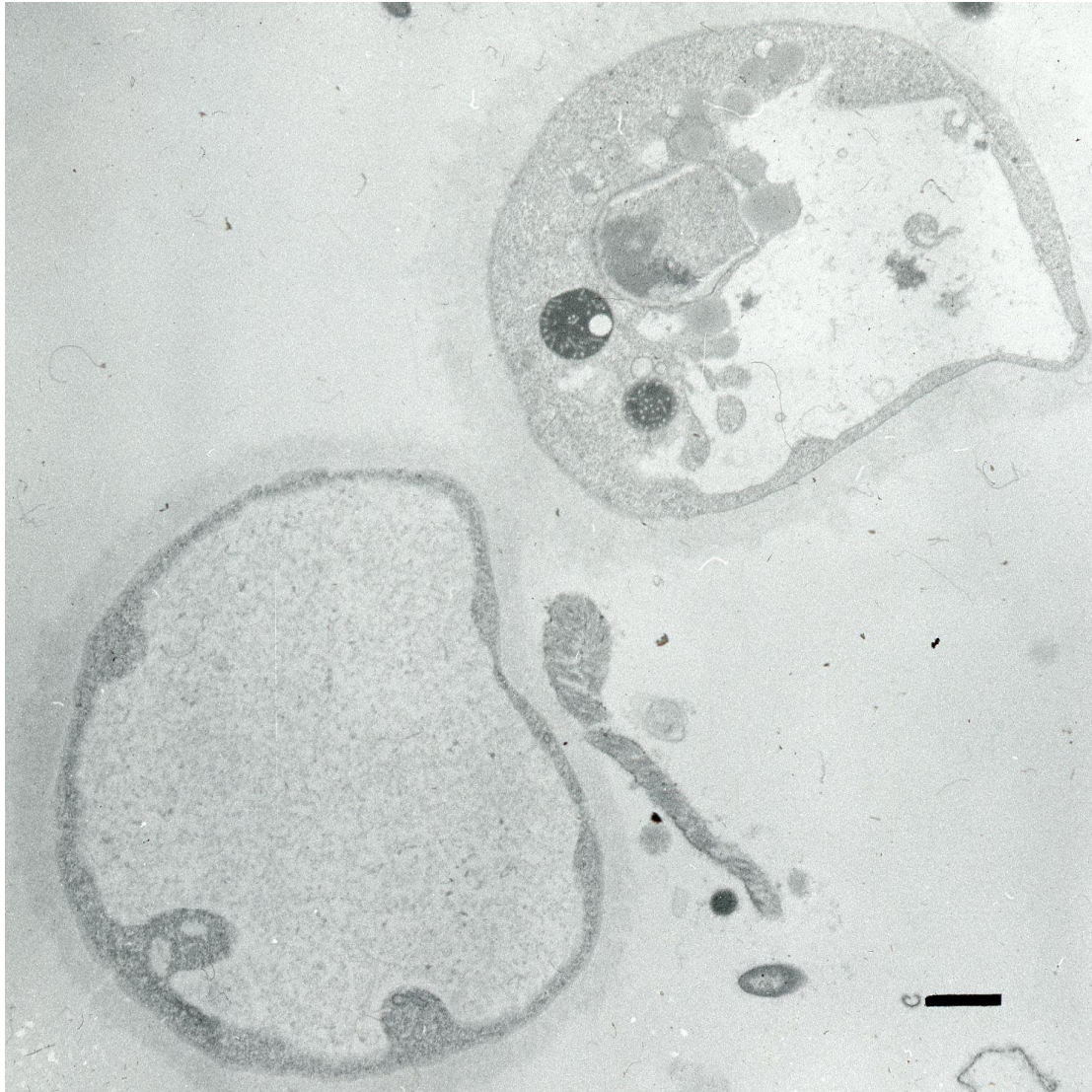
Cultured *Blastocystis hominis*. Immunofluorescent staining with ParaFlorB for *Blastocystis* (Boulder Diagnostics, Oxford Immunotec Global PLC, USA) decorates the cystic pathogen. Immunofluorescence with specific monoclonal Ab



Cultured *Blastocystis hominis*. Immunofluorescent staining with ParaFlorB for *Blastocystis* (Boulder Diagnostics, Oxford Immunotec Global PLC, USA) decorates the plasma membrane of large-sized cystic pathogen (right). Compare the bright field illumination (left)



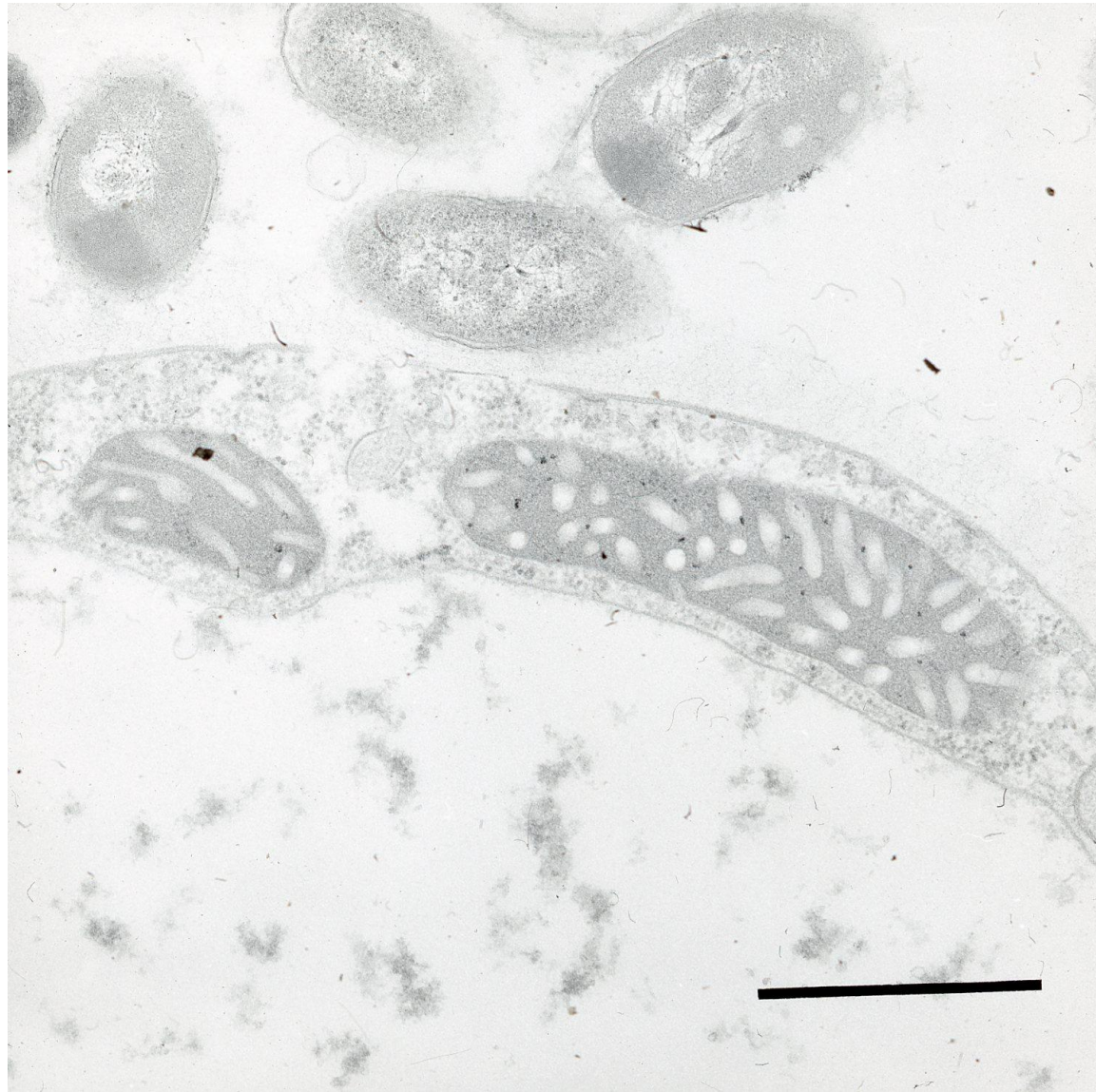
Electron micrograph of the cultured *Blastocystis hominis*. The nucleus is located at the periphery of the cystic Blastocystis. Amorphous material is seen on the plasma membrane. Co-cultured *E. coli* are seen around the pathogen. EM-1



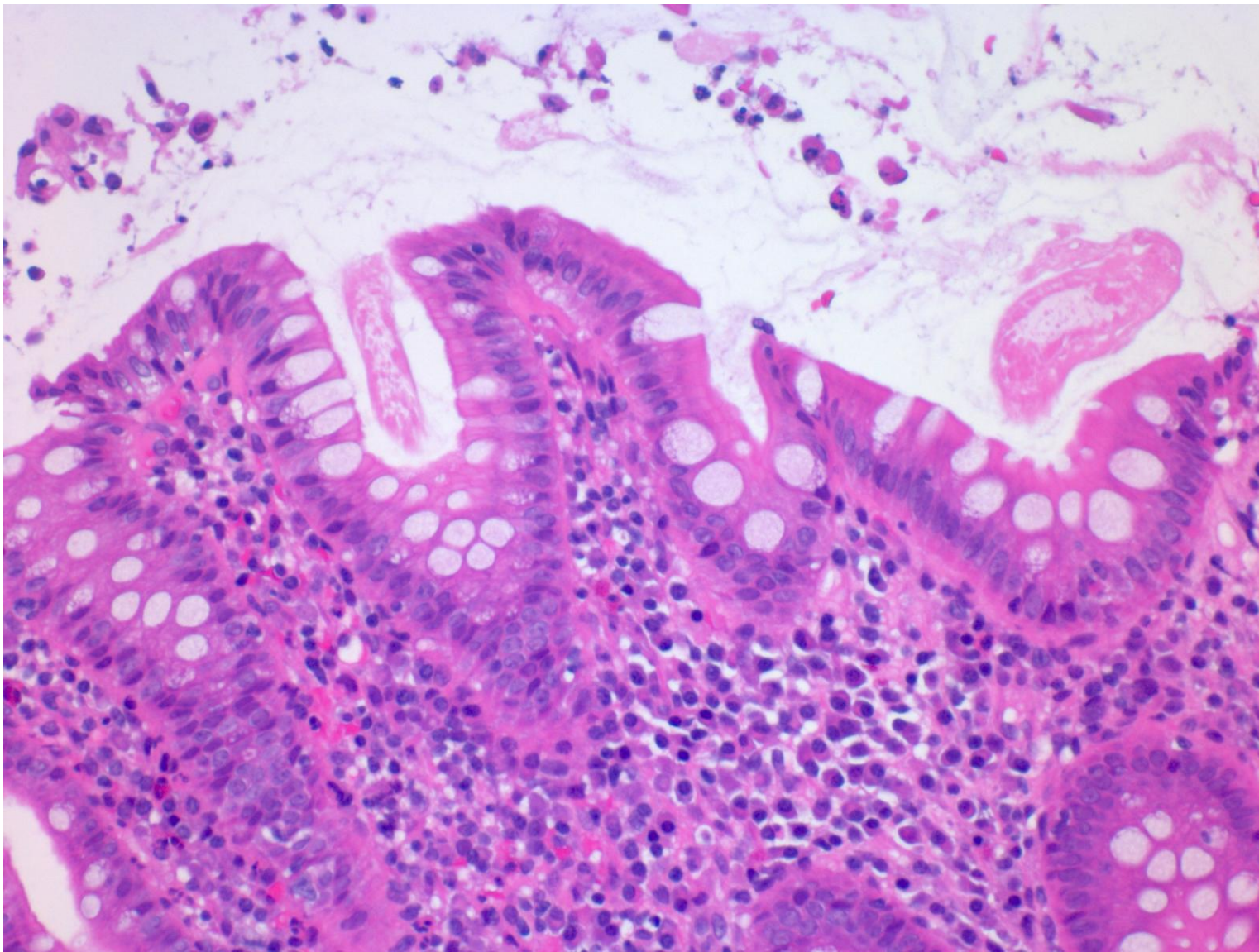
Electron micrograph of the cultured *Blastocystis hominis*. The dark round mitochondria are observed in the thickened portion of the cytoplasm. EM-2



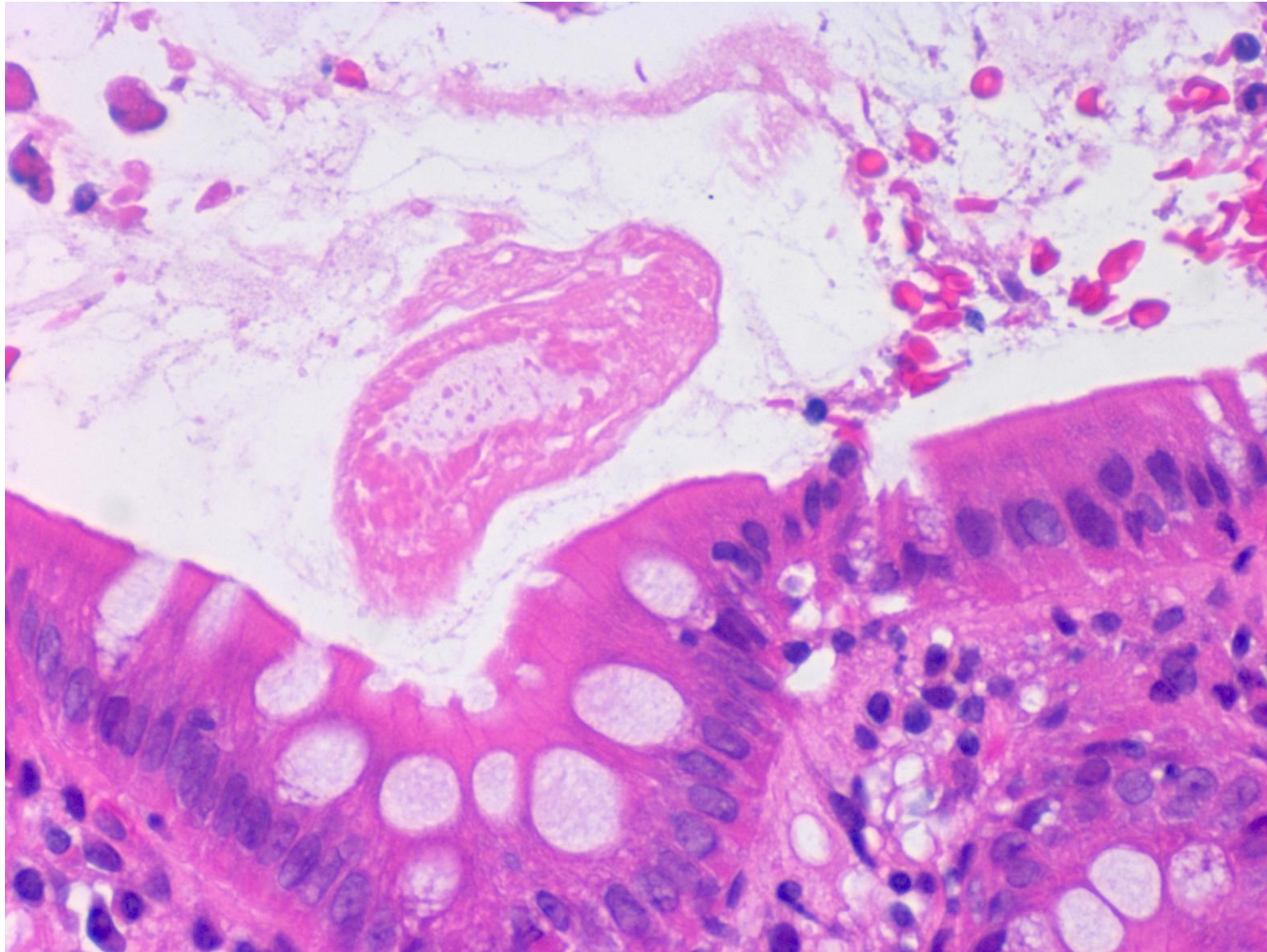
Electron micrograph of the cultured *Blastocystis hominis*. The dark round mitochondria are observed in the thickened portion of the cytoplasm. EM-3



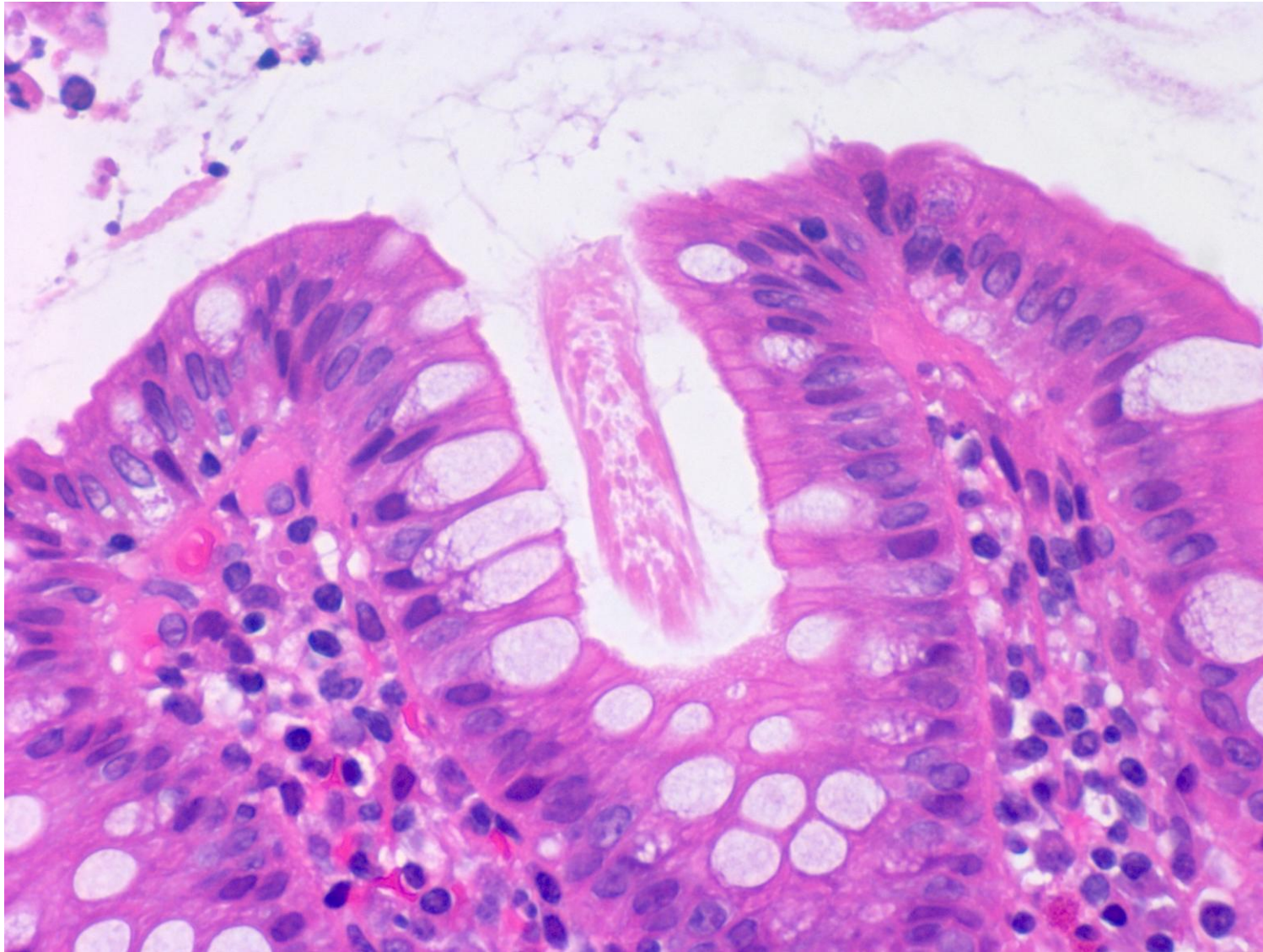
Electron micrograph of the cultured *Blastocystis hominis*. Note the presence of mitochondria in this completely anaerobic pathogen. EM-4



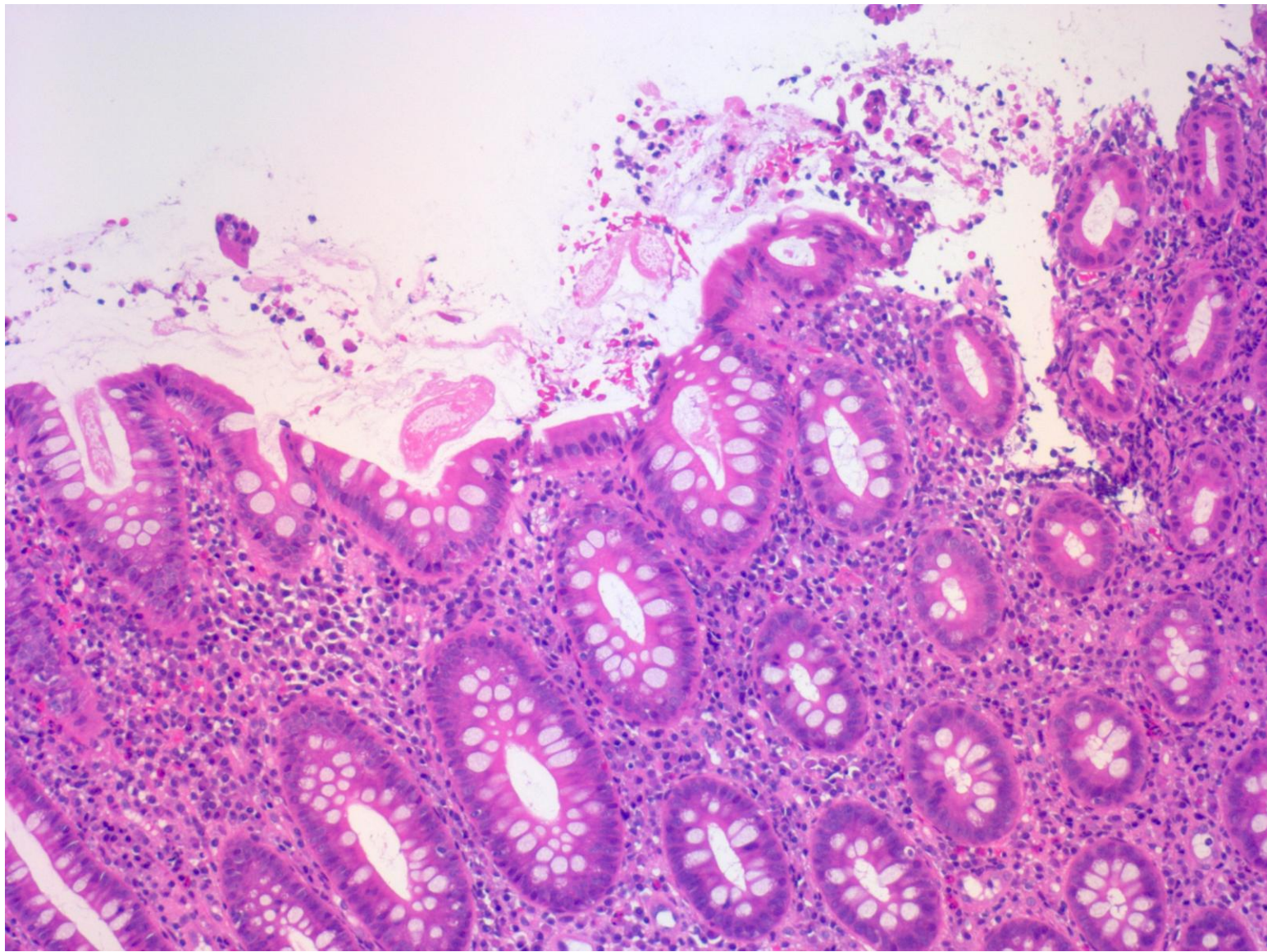
Blastocystis hominis colitis in a 66-year-old male patient. Cystic pathogens are observed on the biopsied colonic mucosa with chronic active inflammation. H&E-a



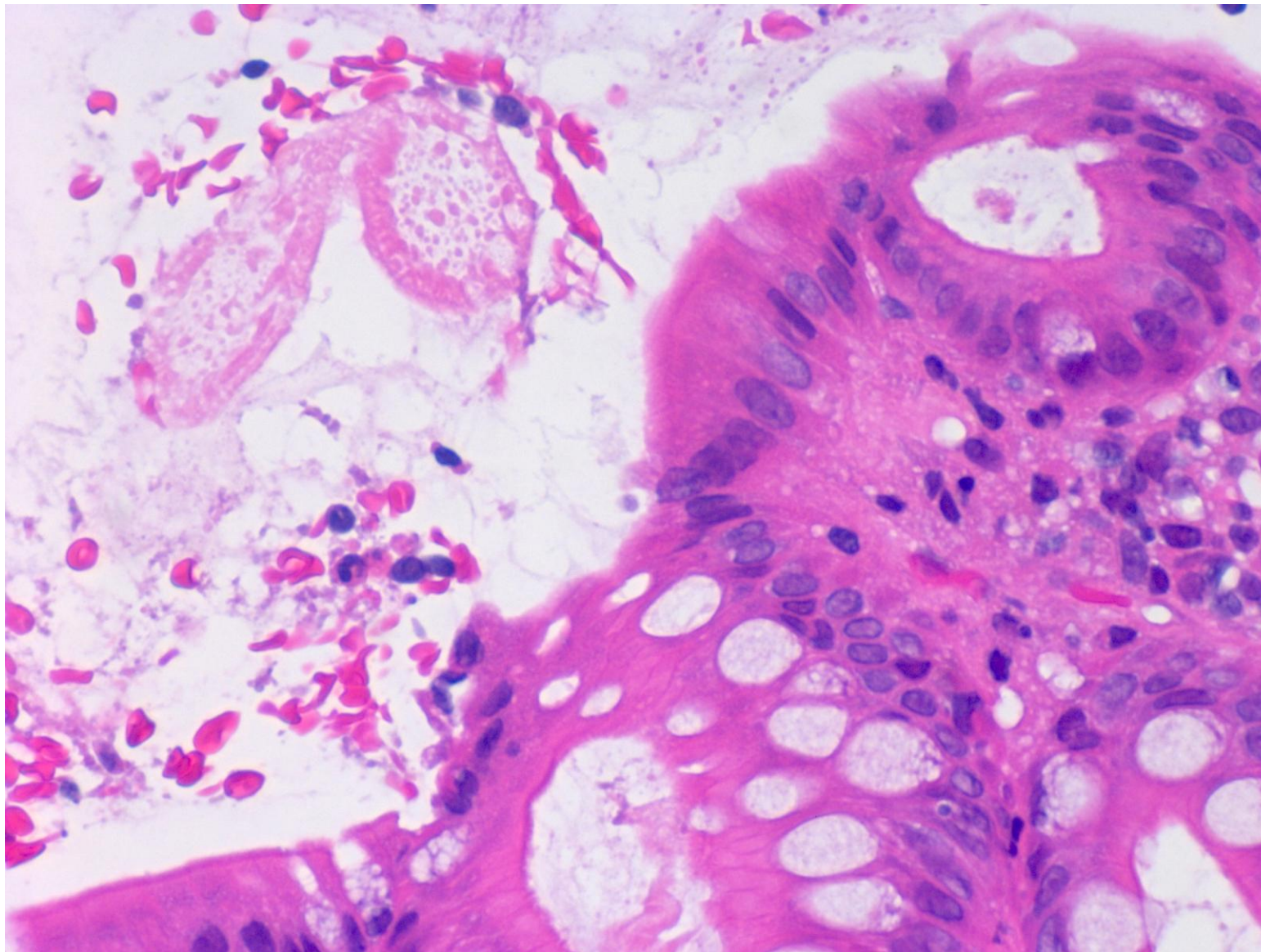
Blastocystis hominis colitis in a 66-year-old male patient.
Cystic pathogens are observed on the biopsied colonic mucosa
with chronic active inflammation. H&E-b



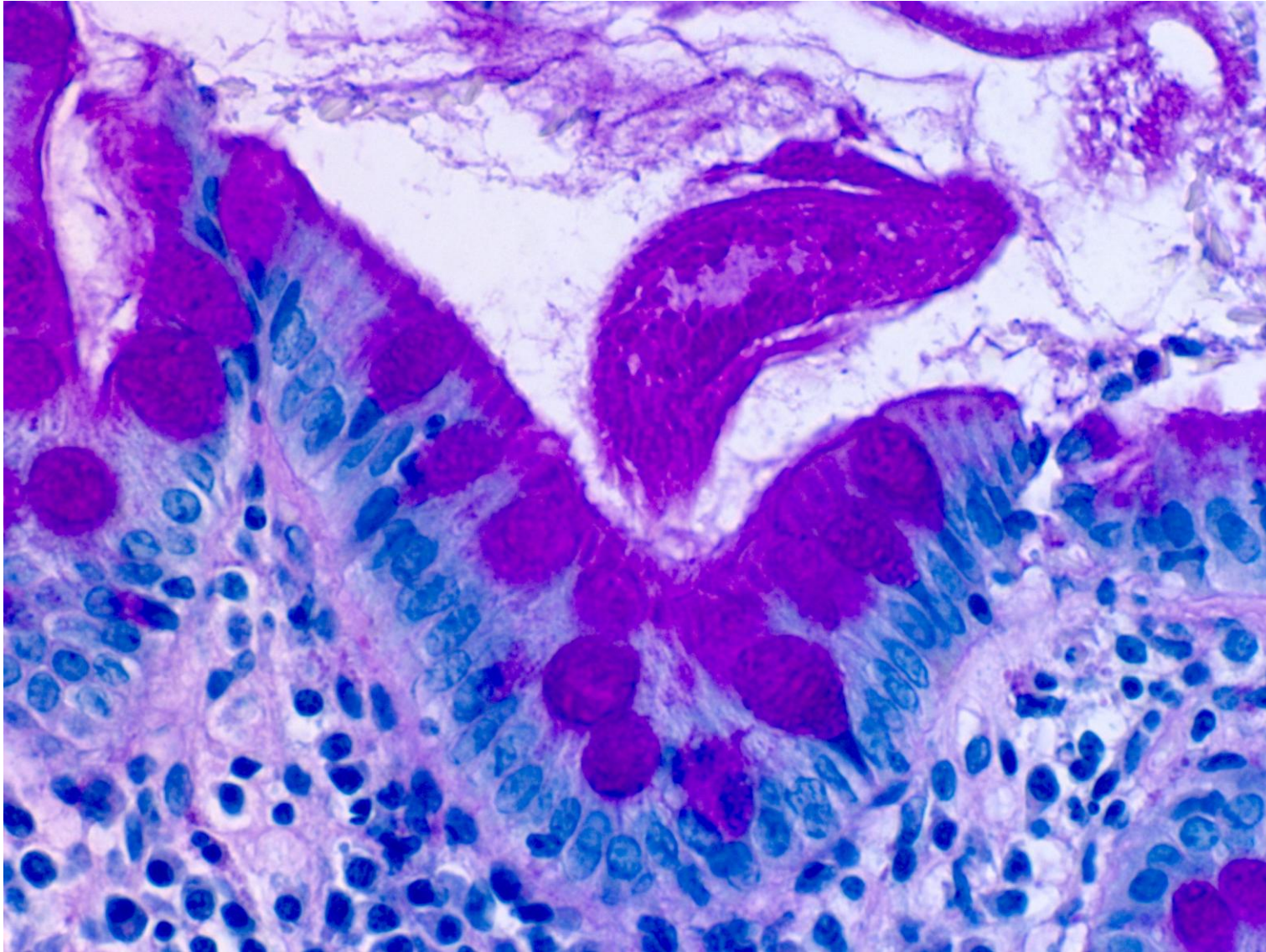
Blastocystis hominis colitis in a 66-year-old male patient. Cystic pathogens are observed on the biopsied colonic mucosa with chronic active inflammation. H&E-c



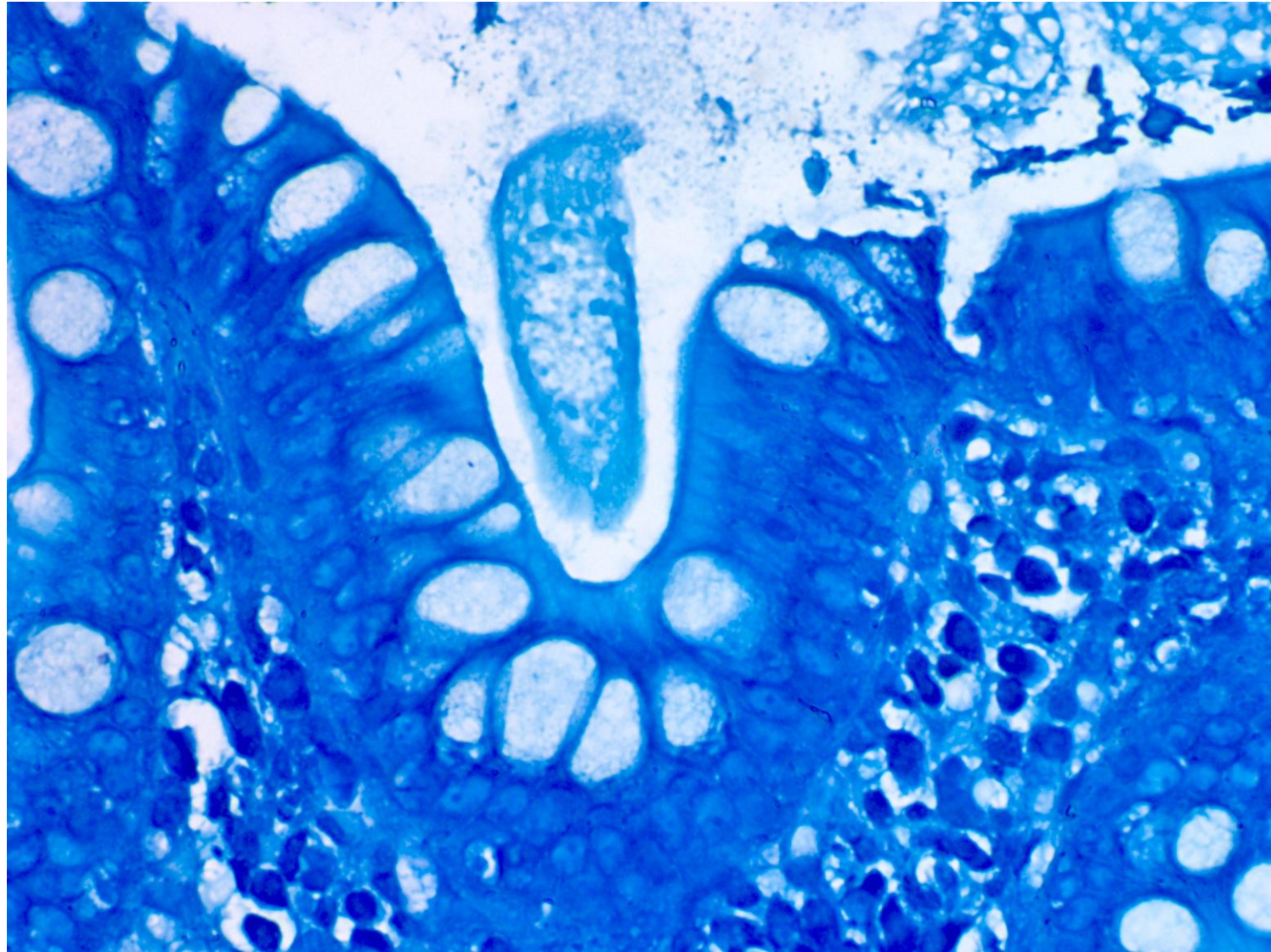
Blastocystis hominis colitis in a 66-year-old male patient. Cystic pathogens are observed on the biopsied colonic mucosa with chronic active inflammation and erosive change. H&E-d



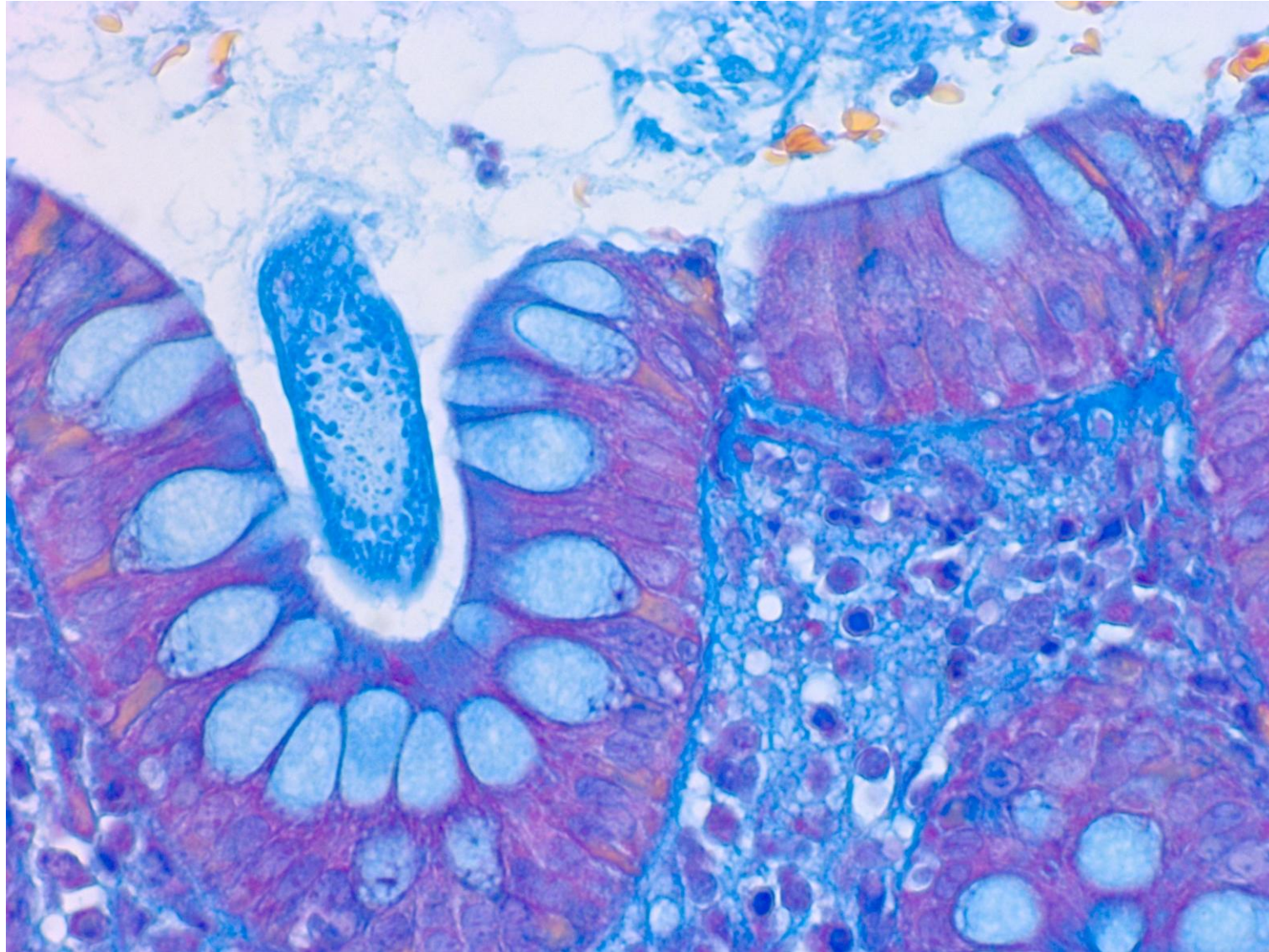
Blastocystis hominis colitis in a 66-year-old male patient. Cystic pathogens are observed on the biopsied colonic mucosa with chronic active inflammation and erosive change. H&E-e



Blastocystis hominis colitis in a 66-year-old male patient. Cystic pathogens are observed on the biopsied colonic mucosa. The pathogen is PAS-reactive even after amylase treatment. D-PAS



Blastocystis hominis colitis in a 66-year-old male patient. Cystic pathogens observed on the biopsied colonic mucosa are stained blue with Giemsa staining. Giemsa



Blastocystis hominis colitis in a 66-year-old male patient. Cystic pathogens observed on the biopsied colonic mucosa are stained blue with Azan staining. Azan