

Entamoeba histolytica Nuclear Division: Mitosis or Meiosis ?

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E. histolytica is the protozoan responsible of 30000 deaths y early . Nuclear division has been extensively studied. Several stages have been defined which resemble the typical eukaryotic mitosis : prophase to telophase stages. However, there are more differences than resemblances: the microtubules (Mts) of the mitotic spindle are radially distributed at prophase. Later, the Mts disposed longitudinally in a one-piece mitotic spindle. This type of nuclear division has been described as pleuromitosis (1). Some other features are different from typical mitosis. Besides that, 5 chromosomes were reported for a clone of HM1:IMSS strain (2). This finding might open the possibility for the ameba to develop a meiotic division. So, we centered our efforts to find out if the nuclear division is a meiosis .

Materials and methods.

E. histolytica trophozoites of HM1:IMSS strain were cultured and processed for electron microscopy by standard methodology. Some preparations were contrasted with acidic Phosphotungstic acid (PTA), which is specific for DNA (3). Thin sections were observed with a Jeol 1010 TEM.

Results

During our observations of nuclear division of *E. histolytica*, we have found some nuclear features which resembled stages of meiotic division. At the beginning of nuclear division, with DNA-specific contrasting, we found inside the nuclei of amebic trophozoites enlonged structures (Fig 1) which seemed to be the “bouquet” stage of meiosis. These structures were disposed along the nucleus, as if it were dividing the amebic organelle. Another trophozoites had a structure with a synaptonemal-like complex (Slc) (Fig 2), with a central element (white arrow) between two layers of electrotransparent material (white arrowheads), which was embedded in a electrodense like-chromosome material. The nuclear envelope is clearly seen (black arrowheads).

Conclusions

The presence of nuclear structures in cells, such as Synaptonemal complexes are an indicator of meiosis. The presence in *E. histolytica* of a structure resembling this complex, led us to think that this parasite might develop a meiosis. Although it is not a typical synaptonemal complex, there is enough resemblance to a typical one.

References

1. Solis and Barrios, 1991. Exper Parasitol 73:235-240.
2. Solis and Adams, 1997. Biology of the Cell 89:475-480.
3. Esquivel et al. 1987. Ultramicroscopy 21:103-110.

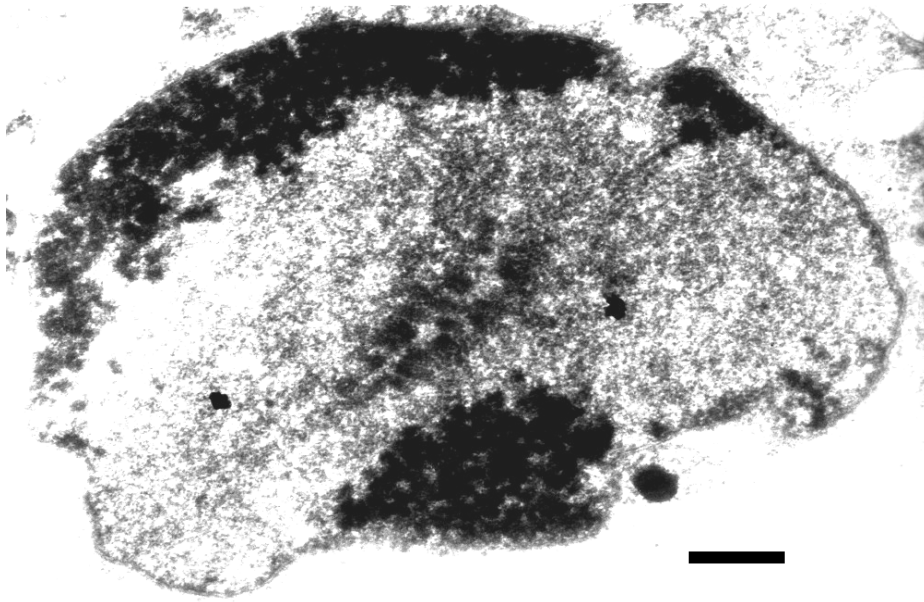


Figure 1. Central structure in amebic nucleus. The presence of this structure might be an indicative of meiosis, due to resemblance with the meiotic “bouquet”. Bar= 1 μm

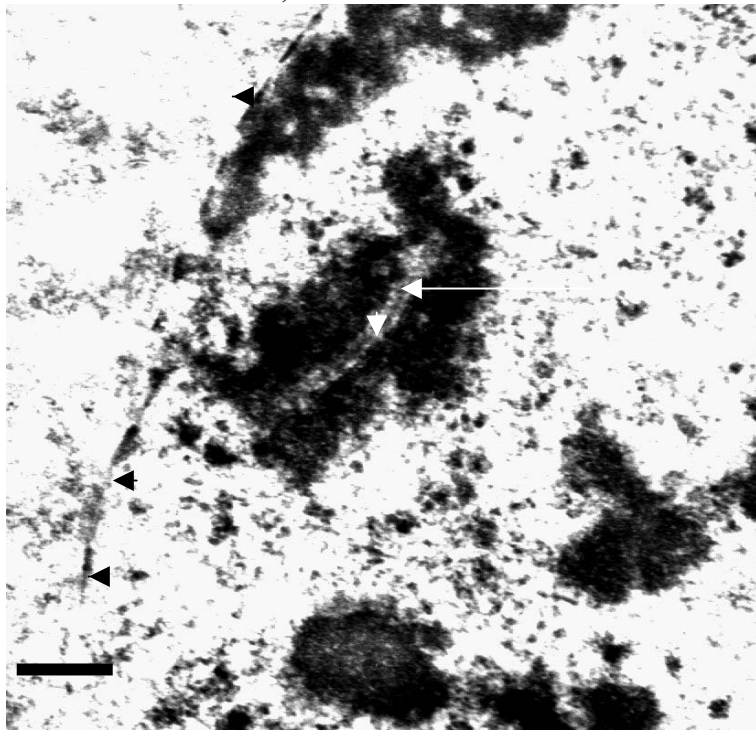


Figure 2. Synaptonemal-like complex. Some amebic nuclei have the presence of this Slc. The central element of Slc (white arrow) is close to electrotransparent elements (white arrowheads). The nuclear envelope is seen (black arrowheads). Bar= 0.5 μm