Research Note

Budding in *Blastocystis*

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The protozoan parasite, *Blastocystis hominis* continues to attract attention in recent times as increasing reports incriminate the parasite to be pathogenic (Stenzel & Boreham, 1996). Many aspects of the parasite is in want of elucidation especially its mode of reproduction.

Division by other modes of asexual reproduction such as plasmotomy, endodyogeny and schizogony were suggested (Zierdt, 1991) but experimental evidence continue to lack in supporting the existence of these reproductive process. The only plausible mode of reproduction accepted till this day is binary fission (Stenzel & Boreham, 1996) which is commonly seen in cultures and sometimes in fecal samples. Recently we have shown a multiple asexual mode of reproduction or schizogony-like mode of reproduction in the parasite. Large numbers of grape-like clusters of progeny *Blastocystis* were seen within the 'mother' cell (Suresh *et al.*, 1994). This reproductive process accounts for the large numbers of parasite within a short duration in cultutes.

The present paper highlights yet another mode of reproduction i.e budding where small cells were seen to pinch off from the *Blastocystis* parasite. A human isolate of *Blastocystis* obtained from the fecal sample of a patient who complained of diarthoea and stomach pain was maintained in Jones' medium (Jones', 1946) at 37°C and sub-cultured into fresh 10 ml screw-capped tubes containing Jones' medium once every 5 days. The old culture tubes were maintained at 37°C and the contents of the sediment containing the parasites were examined everyday under light microscopy.

A small protrusion of cytoplasm at the sides of the host cell was seen in parasites from day 8-old cultures (Figs. 1 & 2). The exogenous protrusion appeared to pinch off from the larger cell (Fig. 3) to form small *Blastocystis*, which retained the characteristic peripheral nuclei.

Budding which is known to occur in other protozoa such as *Acanthocystis, Noctiluca, Myxosporida* and cilliates

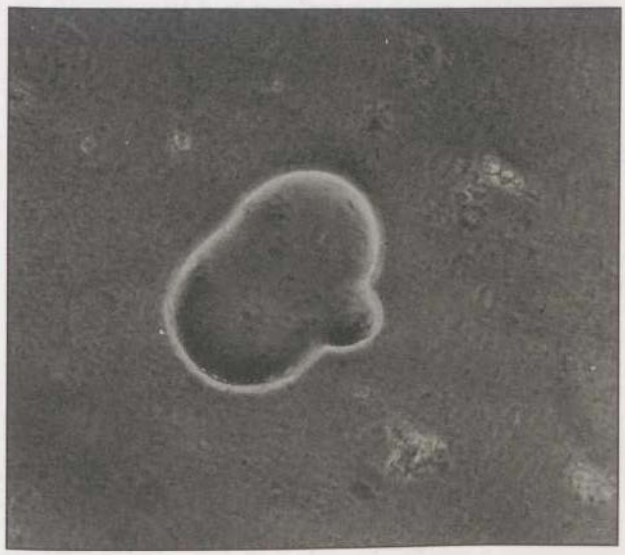

Fig. 1. *Blastocystis hominis* in cultures. Notice the exogenous protrusion of cytoplasm from the side of the parasite.

Fig. 2. Two parasites, one showing budding (bottom) and the other binary fission (top). Note two protrusions in the parasite that shows budding.

Fig. 3. Small cytoplasm getting pinched off from the larger cell. Note the refractile nucleus in the periphery of the cell that is about to be pinched off.

is the formation, either through exogenous or endogenous, of one or more smaller individuals from the parent organism. This mode of reproduction in *Blastocystis* was suggested as early as 1938 (Ciferri & Redaelli, 1938) but later refuted due to lack of evidence. We have also seen budding taking place previously in drug-treated cultures suggesting that this process of reproduction could be a survival mechanism triggered perhaps by stress. When either nutrients in the culture medium gets depleted or when some other form of stress is induced for example drug pressure, a exogenous bulge from the parasite forms, which then gets pinched off from the larger cell to form small forms of *Blastocystis*.

Zierdt (1988) reported that binary fission and plasmotomy were two distinct modes of reproduction seen in *Blastocystis*. In our present observation we did not find the parasite undergoing plasmotomy which is the division of two small multinucleate individuals, the cytoplasmic division taking place independently of nuclear division.

The paper provides experimental evidence for budding to exist in the life cycle of the parasite. Budding perhaps accounts for recurrent infections especially in patients treated for *Blastocystis*, where pinched off forms of the parasite survive the drug treatment.

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