

IATP Presidential oration

Blastocystis spp: Pathogen or commensal

Dr S.C. Parija

President, Indian Academy of Tropical Parasitology &
Vice Chancellor, Sri Balaji Vidyapeeth (Deemed University), Pillaiyarkuppam, Puducherry

Blastocystis is an unusual enteric protozoan parasite of humans and many animals. It has a worldwide distribution and is often the most commonly isolated organism in parasitological surveys. *Blastocystis* spp. belongs to the phylum Stramenopila, a complex and heterogeneous evolutionary assemblage of heterotrophic and photosynthetic protozoa. Four forms of *Blastocystis* spp. (vacuolar, granular, amoeboid, and cyst) were described in stools and/or in vitro cultures. *Blastocystis* spp. prevalence in humans often exceeds 5% in industrialized countries and can reach as high as 76% in developing countries. However, prevalence data are largely dependent on the methods used for detection, quantitative PCR being the most sensitive method, meaning that infections by *Blastocystis* spp. are likely underestimated.

Species of the genus *Blastocystis*, which are single-cell, intestinal protozoan parasites of humans and animals, remain mysterious, with unclear clinical and epidemiologic significance. Infections have ranged from asymptomatic carriage to non-specific gastrointestinal symptoms and have also been linked to irritable bowel syndrome and urticaria in some patient populations. In vivo endoscopy and biopsy analyses in symptomatic patients indicated that *Blastocystis* spp. do not invade the colonic mucosa, but lead to disturbances on the barrier function and permeability. However, in vitro studies showed that both parasite and parasite lysates have damaging effects on intestinal epithelial cells causing apoptosis and degradation of tight junction proteins occludin and ZO1, resulting in increased intestinal permeability. Recent in vitro studies have also shown the possible role of *Blastocystis* in the exacerbation of pre-existing cancer; in particular, *Blastocystis* ST3 can elicit higher proliferation of colon cancer cell line and such cases have been reported too. Despite accumulating evidence indicating that the parasite is pathogenic and that proteases are involved in pathogenesis, not a single virulence factor gene has been identified, cloned, and characterized. As more and more studies are conducted, the roles of each *Blastocystis* subtype in disease will become clearer.