Effects of symptomatic and asymptomatic isolates of *Blastocystis hominis* on colorectal cancer cell line, HCT116

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Abstract

The pathogenesis of *Blastocystis hominis* in human hosts has always been a matter of debate as it is present in both symptomatic and asymptomatic individuals. A recent report showed that *B. hominis* isolated from an asymptomatic individual could facilitate the proliferation and growth of existing cancer cells while having the potential to downregulate the host immune response.

The present study investigated the differences between the effects of symptomatic and asymptomatic *B. hominis* (Blasto-Ag) on the cell viability and proliferation of colorectal cancer cells. Besides that, the gene expression of cytokines and nuclear transcriptional factors in response to the symptomatic and asymptomatic *B. hominis* antigen in HCT116 was also compared. In the current study, an increase in cell proliferation was observed in HCT116 cells which led to the speculation that *B. hominis* infection could facilitate the growth of colorectal cancer cells. In addition, a more significant upregulation of Th2 cytokines observed in HCT116 may lead to the postulation that symptomatic Blasto-Ag may have the potential in weakening the cellular immune response, allowing the progression of existing tumor cells. The upregulation of nuclear factor kappa light chain enhancer of activated B cells (NF-κB) was observed in HCT116 exposed to symptomatic Blasto-Ag, while asymptomatic Blasto-Ag exhibited an insignificant effect on NF-κB gene expression in HCT116. HCT116 cells exposed to symptomatic and asymptomatic Blasto-Ag caused a significant upregulation of CTSG, which lead to the postulation that the Blasto-Ag may enhance the invasive and metastasis properties of colorectal cancer. In conclusion, antigen isolated from a symptomatic individual is more pathogenic as compared to asymptomatic isolates as it caused a more extensive inflammatory reaction as well as more enhanced proliferation of cancer cells.