

Assessment of immune response in chemotherapy-treated colorectal cancer patients to blastocystis sp. using in vitro PBMC model

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Blastocystis sp. (Blastocystis) has been increasingly associated to colorectal cancer (CRC) due to its high prevalence in this cohort and its ability to aggravate cancer cells in vitro. However, the ability of Blastocystis to exacerbate immune response in cancer patients undergoing chemotherapy has never been explored. This study investigates the effect of different subtypes of Blastocystis solubilised antigen (BSA) on proliferation and gene expression in peripheral blood mononuclear cells (PBMCs) isolated from healthy donors (HDs) and chemotherapy-treated colorectal cancer patients (CRCPs). Blastocystis isolated from symptomatic individuals were used in this study. Upon exposure to BSA, the proliferation of adhering PBMCs (monocytes/macrophages) was measured via MTT assay and the gene expressions of Th1 and Th2 cytokines were measured among the nonadherent PBMCs (lymphocytes) via RTPCR. In the presence of BSA, phytohemagglutinin (PHA)-activated PBMCs from HDs proliferated steadily, but at lower concentrations, resting PBMCs remained inactive until they reached a particular threshold concentration of BSA (10 µg/ml), at which point they began to proliferate. PBMCs isolated from CRCPs showed significant variable proliferation upon incubation with BSA whereas a more constant proliferation was observed among the HDs. The gene expression of pro-inflammatory cytokines in the suspended PBMCs was higher in HDs compared to CRCPs. In activated PBMCs from HDs, the downregulation of certain genes is more apparent at greater concentrations of BSA (10.0 µg/ml) than at lower concentrations (0.001 µg/ml). Therefore, we conclude that the ability of monocytes/macrophages to proliferate and the release of important cytokines by lymphocytes could be reduced in CRCPs in the presence of Blastocystis which favours its opportunistic nature. We also conclude that, only a certain concentration of BSA have the capacity to trigger human immune response in healthy individuals.

Biography

Vinoth Kumarasamy is a Senior Lecturer in the Department of Parasitology and Medical Entomology at National University of Malaysia. He has a PhD in Parasitology from University of Malaya, Malaysia. He is a member of Malaysian Society of Parasitology and Tropical Medicine (MSPTM). He is an accomplished researcher and expert in the fields of microbiology, parasitology, natural products, immunology, and cancer-related research, has dedicated his career to advancing our understanding of complex biological systems.

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