

COURTNEY ROLEN, ELISHA MARTIN, RAJNISH SAHUTESFAYE BELAY, Bluefield State College, Bluefield, WV, Alabama State University, Montgomery, AL. Gene Expression of Transcription factors and Secretion of Cytokines in Co-culturing of Dendritic Cells and Naïve T cells in Stressed AHCC-fed Mice

Cold-induced stress is known to inhibit the activity of immune cells and has been shown to cause different expression of cytokine profiles during *Chlamydia muridarum* genital infection. Active Hexose Correlated Compound (AHCC) is a mushroom extract known to modulate the immune system, the mechanism is not well known. The purpose of this study was to investigate if AHCC feeding to stressed mice would affect the pattern of surface marker expression of transcription factors and CD4+ T cell cytokines. We hypothesized that AHCC feeding to stressed mice decreases the expression and secretion of GATA-3 and IL-4 in stressed mice compared to PBS-fed stressed mice. We used magnet enrichment protocols to isolate DCs from bone marrow and naïve T cells from the spleen. Naive T cells and matured DCs were co-cultured for 24 and 48 hours. A quantitative RT-PCR and ELISA were used to determine gene expression and secretion of cytokines, respectively. Our data show downregulation of transcription factor GATA-3 in AHCC-fed mice (-0.45 ) and upregulation of GATA-3 in PBS-fed stressed mice (+1.5). In contrast, transcription factors T-bet was upregulated in stress AHCC-fed (0.9) and non-stressed (+2.0) during infection. Moreover, non-stressed (+2.9) and AHCC-fed (+1.85) mice showed a significant upregulation of T-bet during *Chlamydia muridarum* genital infection. Increased secretion of IL-12 and IFN-g and decreased secretion of IL-4 and IL-23 was observed in AHCC-fed mice compared to PBS-fed mice. Overall, our results show that AHCC-feeding leads to the restoration of the function of the protective immune system against chlamydia genital infection. (Supported by NIH Grant P20GM103434 to the West Virginia IDeA Network for Biomedical Research Excellence and NIH Grant P20GM103434 awarded to Bluefield State College).