Inhibitory effect of a beverage EM・X GOLD on Epstein-Barr virus infection

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[Objective] To elucidate immuno-biological functions of a fermentation product EM・X GOLD composed of effective microorganisms (EM) on Epstein-Barr virus (EBV) infection. EBV is ubiquitous in humans and is associated with various malignant and non-malignant immunological and/ neurological diseases. EBV generally infects human B-cells latently and reactivates in the cells with many kind of stress.

[Methods] The effect of EM・X GOLD for the following EBV-specific functions was studied. (1). Regression-assay of EBV -immortalization (permanent cell growth) of B cells: Peripheral blood mononuclear cells (PBMC) from a healthy adult EBV-carrier were infected with an EBV B95-8- strain and cultured in an EM・X GOLD- containing medium. Immortalization was assessed using an inverted microscope. (2) EBV-reactivation assay in B95-8 cells: Latent EBV in the cell is reactivated in cultured cells with low temperature at 33C. The expression of EBV-specific antigens was analyzed using a fluoresce microscope.

[Results] (1). EBV immortalization was inhibited by EM・X GOLD. Immortalization occurred in the infected PBMC of the control without EM・X GOLD; however, it did not occur or occur at low ratio and delayed time on EM・X GOLD containing culture. (2). EBV reactivation was suppressed with EM・X GOLD. Reactivation was highly induced in the control culture, while the reactivation in the EM・X GOLD containing culture was reduced relative to the control. Cell conditions in the EM・X GOLD- containing culture were better than that of the control.

[Conclusions] EM・X GOLD had suppressive effects on EBV infections. We speculate the following mechanisms: (1) EM・X GOLD may activate immune- system such as cytotoxic T lymphocytes, which exist in PBMC of EBV carrier, kill the infected cells and inhibit the immortalization. (2) EM・X GOLD may stimulate a natural host-cell defense mechanism(s), which controls virus reactivation by the stress of low temperature.