일반 4

Ginsenoside Rg3 induced antigen presenting cell maturation : significance in anti-tumor responses

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Ginsenoside Rg3 is one of the active saponin fraction of total ginseng extract. Especially, Rg3 is known to be an efficient inhibitor of tumor growth and angiogenesis in some tumor models. Based on the evidence of Rg3-induced immune modulation, we hypothesized that the modulation of tumor microenvironment and immune evasion factors is one of the mechanism of Rg3-induced anti-tumor activity. As a first step to confirm this hypothesis, we observe the Rg3 effect on the antigen presenting cell maturation, especially dendritic cells (DCs) *in vitro*. Only the fully mature DCs can induce tumor Ag-specific immunity and immature DCs are reason for the immune tolerance *in vivo*. Mouse monocyte derived-DCs or hematopoietic stem cell derived-DCs were ex vivo cultured and matured with either Rg1, Rg3 (10m 20 & 50ug/ml each), and well-known CD40L or PGE2 (R1-DC, R3-DC, C-DC or P-DC, respectively). In monocyte-DC, all four maturation factors did not significantly alter the phenotypes of cultured cells comparing immature control cells. However Rg3-induced maturation of stem cell-DC was evidenced by significant induction of DC-related phenotypes including CD11c, MHC II, CD8, CCR7, CD54 and TLR4. Rg1 did not induce significant changes. As a functional parameter of maturation, IL-12 secretion was observed. Induction of IL-12 secretion was observed in Rg3 as well as CD40L matured monocyte and stem cell-DCs, both (about 200% of immature control-DC). Reduced IL-12 secretion was observed in P-DC and Rg1 has no effect on cytokine secretion. Data suggest that ginsenoside Rg3 might modulate tumor microenvironment by either cytokine secretion and immune cell stimulation including DC maturation to induce anti-tumor responses. To confirm this data *in vitro* as well as *in vivo* experiments are in progress.

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