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Anti-Tumor Activity of Dendritic Cells Pulsed with Korean Red-Ginseng

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Korean ginseng is a medicinal herb widely used in Asian countries. Dendritic cells(DCs) play a pivotal role in the initiation of T cell-mediated immune responses, making them an attractive cellular adjuvant for use in cancer vaccines. In this study, we examined the effects of Red-ginseng(crude saponin) on the DCs phenotypic and functional maturation. Immature DCs were cultured in the presence of GM-CSF and IL-4, and the generated immature DCs were stimulated by crude saponin or LPS, respectively, for 24hours. The expression of surface co-stimulatory molecules, including MHC(major histocompatibility complex) class Ⅱ, CD40, CD80 and CD86, were increased on DCs that were stimulated with crude saponin, but antigen-uptake capacity was decreased. T cell activation capacity of Red-ginseng crude saponin-treated DCs as analyzed by allogeneic T cells proliferation and IL-2 production was increased. Furthermore, $CD8^+$ syngeneic T cell(OVA-specific) proliferation and IFN-γ production was significantly increased. However, $CD8^+$ syngeneic T cell not secreted IL-2 in responding to DCs treated with Red-ginseng crude saponin. Also, immunization with OVA with Red-ginseng crude saponin-treated DCs induced higher cytotoxicity of splenocytes to EG7 cells, a clone of EL4 cells transfected with an OVA cDNA, than OVA only treated DCs. These results indicate the immunomodulatory properties of Red-ginseng crude saponin, which might be therapeutically useful in the control of cancers and immunodeficient diseases through the up-regulation of DCs maturation.