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Differential immunoregulatory effects of curcumin, ellagic acid, quercetin, and daidzein

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Many flavonoids have been known with their modulatory effect on immune functions. In this study, we chose four well known flavonoids (curcumin, ellagic acid, quercetin, daidzein) to investigate and compare their modulatory capacity in three representative in vitro immune responses, such as spleen cell proliferation, mixed leukocyte response, and macrophage function. Curcumin, ellagic acid, and quercetin, but not daidzein, decreased the spleen cell proliferation induced by LPS and Con A in a dose-dependent manner. In the mixed leukocyte response measured by the proliferation of BALB/c mouse splenocytes stimulated with DBA/2 mouse splenocytes, all 4 flavonoids including daidzein elicited suppressive responses. In the mean time, three of them (curcumin, ellagic acid, and daidzein) but not quercetin showed a significant increase of phagocytic activity of RAW264.7 macrophage cells. Although there is a strength difference, these 4 flavonoids had similar activity in immune modulation (curcumin > quercetin > ellagic acid >daidzein). These suppressive effects on both spleen cell proliferation induced by either mitogens or alloantigen and the stimulatory effects on phagocytic function of macrophage need to be further identified in the respect of action mechanism.

Keyword : Flavonoids, splenocyte, proliferation, phagocytic function, immune modulation,