

Immunomodulatory and antiviral activity of almond skins.

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Abstract:

The elimination of a viral infection requires a proinflammatory host response (type 1 immunity), characterized by activation of mononuclear cells and production of proinflammatory cytokines, such as interferons (IFNs), tumor necrosis factor (TNF)-alpha and interleukin (IL)-12. On the other hand, IL-4 and IL-10 play a role in decreasing the inflammatory response supported by helper T (Th)1 cells. In this study we evaluated the effects of almond skins on the release of cytokines by peripheral blood mononuclear cells (PBMC), either infected or not with herpes simplex virus type 2 (HSV-2). Natural (NS) and blanched almond skins (BS) were subjected to simulated gastric and duodenal digestion and used at not cytotoxic concentrations. NS induced a significant decrease in HSV-2 replication, whereas extracts obtained from BS did not significantly influence the viral replication. High levels of cytokines production, such as IFN-alpha (38 ± 5.3 pg/ml), IL-12 (215 ± 17.1 pg/ml), IFN-gamma (5 ± 0.7 IU/ml), TNF-alpha (3940 ± 201.0 pg/ml), were detected. Moreover, IL-10 (210 ± 12.2 pg/ml) and IL-4 (170 ± 21.4 pg/ml), representative of Th2 responses, were found. Our data suggest that almond skins improve the immune surveillance of PBMC towards viral infection, both by triggering the Th1 and Th2 subsets.