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Opinion

Increasing Resveratrol Effectiveness as an Anti-cancer Agent for Human Therapy

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Resveratrol, a polyphenol produced by certain plants is shown, quoting Aggarwal, to "exhibit anti-cancer properties in a wide variety of tumor cells, including lymphoid and myeloid cancers; multiple myeloma; cancers of the breast, prostate, stomach, colon, pancreas and thyroid; melanoma; head and neck squamous cell carcinoma; ovarian and cervical carcinoma" [1]. The inhibition of multiple types of cancer has also been reported by Niles and Rankin, studies being done with tissue culture and rodent cancer models [2].

Unfortunately because of a low bioavailability free resveratrol may have a limited effectiveness for human cancer therapy due to inadequate tissue levels of the drug for cancer inhibition [2,3]. Resveratrol in the plasma is rapidly eliminated from the body after sulfate and glucuronic acid conjugation of the phenolic groups of the resveratrol [3]. This problem can be circumvented by the acetylation of the three hydroxyl groups of resveratrol which blocks the conjugation with the sulfates and glucuronic acids and subsequent rapid elimination of these resveratrol metabolites.

It has been shown in two types of cancers that the acetylated resveratrol conjugates retain the cytostatic and cytotoxic activities of free resveratrol [4,5]. Presuming this activity is present for other cancer types and with the increased plasma longevity of the conjugates it is likely that they will have an increased anti-cancer activity compared to administering readily eliminated free resveratrol. The latter can presumably be released in the tissues from the resveratrol conjugates to the active free resveratrol.

In order to maintain the conjugate linkage to enhance its tissue uptake treatment with caffeine can be employed [6].

The toxicity of the conjugate as it is delivered into tissues must be determined in animal studies in consideration of subsequent human trials.

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