

Quercetin enhances UVA-induced DNA damage in a rat fibroblast cell line

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Ultraviolet A (UVA) radiation from sunlight induces the production of reactive oxygen species (ROS), affecting a variety of cellular targets including the DNA. Quercetin, a flavonol present in many fruits, vegetables and beverages has been reported as a powerful antioxidant with an important role in prevention of carcinogenesis. The use of this compound, in topical formulations, could be of benefit in the prevention of skin damage produced by sunlight exposure.

We investigated the effect of quercetin on DNA damage induced by UVA radiation in the rat subcutaneous fibroblast cell line, L929. Cells were irradiated by UVA light for 1h, in the presence of quercetin and DNA damage assessed, in individual cells, by the alkaline single cell gel electrophoresis assay (Comet Assay). Our data showed that the combination of UVA with quercetin, at the three concentrations tested (20, 30 and 50 μ M) enhances the level of DNA damage in a concentration-dependent manner. However, this effect seems not to be the same when cells are pre-incubated with quercetin, followed by irradiation, in the absence of the compound. We are investigating the mechanisms behind the observed harmful effect of quercetin together with UVA irradiation and trying to relate it, with the ROS levels, in both experimental conditions. The effect obtained suggests that, despite the well known antioxidant beneficial effects of quercetin in many different situations of oxidative stress, precautions should be taken if we think in the development of topical preparations with this compound, to be used on body areas exposed to sunlight.

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