

## Resveratrol

Resveratrol (3, 5, 4'-trihydroxystilbene) is a stilbenic phenolic compound mainly present in grape products, as free form, and as glucoside (resveratrol-3-O-glucoside). Resveratrol is of great interest in nutrition and medicine due to its potential health benefits, such as anti-carcinogenic, neuroprotector and antioxidant effects, as a modulator of lipid and lipoprotein metabolism, antiplatelet aggregator, and its estrogenic activity. Indeed, it has been hypothesized that resveratrol uses the same pathways activated by caloric restriction. The biological effects have been studied mainly in vitro, although there is also growing in vivo evidence. Some effects, such as antioxidant effects, require a high concentration of resveratrol in tissues, although chemopreventive and chemotherapeutic anti-cancer effects are an exception. In this case, resveratrol affects the activity of transcriptional factors involved in proliferation and stress responses and leads to the modulation of survival and apoptotic factors in carcinogenesis. In atherosclerotic and neurodegenerative diseases, the effects of resveratrol are not only due to its antioxidant and scavenging activities, but also to its participation in the modulation of signal transduction pathways and in the activation of several enzymes at micromolar concentrations.

At present, studies are focusing on the bioavailability of resveratrol in humans. It is reasonably well absorbed from the gut but its bioavailability is low. Therefore, the benefits on health attributed to the ingestion of resveratrol are most likely related to biologically active metabolites. In this context, the characterization of its metabolic profile in vivo and specifically in humans will help to show which metabolites may interact to produce a signal or reach target organs and therefore be responsible for the benefits of resveratrol on health.

Our research group, across clinical and epidemiological studies, is focusing on the bioavailability of resveratrol in humans after a moderate consumption of grape products such as wine and sparkling wine. The utilization of mass spectrometry has enabled us to optimize very sensitive and selective methods to detect resveratrol and its metabolites in biological tissues: LDL, plasma, urine, SNC.

A nutritional biomarker is a compound or metabolite of itself that is measured in the organism (plasma, urine...) and is used to explain individual exposure to food. Nutritional biomarkers have several advantages according to data nutritional surveillance. A good nutritional biomarker should comply with several requisites: specificity, an adequate half life and a good correlation biomarker against ingestion. Resveratrol metabolites in urine can be used as biomarkers of moderate wine consumption.

We are currently participating in the PREDIMED study in order to prove the results of this large epidemiological study, in which individuals ingest different models of wine consumption (quantity and type).

### GROUP PUBLICATIONS:

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