Genotype effects on metabolism of soy isoflavones

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Observational studies in human populations, human intervention studies, dietary studies in rodent models and mechanistic investigations using cell line models provide evidence that soy isoflavones can protect against diseases and conditions that include cardiovascular disease, cancer, osteoporosis, diabetes and menopausal symptoms. However, the evidence is not unequivocal, and we suggest that a confounding factor may be differences in the way that individuals metabolise these compounds. The isoflavones occur in natural food sources predominantly as β-glucosides, which undergo metabolism to release the aglycones. It is an unproven assumption that parent aglycones, rather than their phase 2 metabolites, are the biologically-active forms.

One hundred pre-menopausal women recruited prospectively on the basis of their genotype for variants in enzymes known to have a role in isoflavone metabolism took isoflavones as a bolus dose. We observed inter-individual differences in the profile and quantity of metabolites excreted in urine over the subsequent 24 h. Notably, the UGT1A1*28 genotype was associated with differences in the excretion of isoflavone glucuronides and sulphates.

We propose that these effects of genotype on the metabolism of the isoflavones may affect biological activity at an inter-individual level. These differences are likely to be important for the design and interpretation of studies that address efficacy and also with respect to the benefit to be derived by specific individuals from the inclusion of these compounds in the diet.

Reference