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Pomegranate polyphenols and urolithin A inhibit α-glucosidase, dipeptidyl peptidase-4, lipase,

triglyceride accumulation and adipogenesis related genes in 3T3-L1 adipocyte-like cells

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Abstract

Ethnopharmacological relevance

pomegranate fruit is considered an antidiabetic medicine in certain systems of traditional medicine. In

addition, pomegranate polyphenols are known as powerful antioxidants with beneficial effects such as the

reduction of oxidative / inflammatory stress and the increase of protective signalling such as antioxidant

enzymes, neurotrophic factors and cytoprotective proteins.

Aim of the study

this work evaluates the effects of pomegranate juice, its main polyphenols known as ellagic acid and

punicalagin, as well as its main metabolite urolithin A, on physiological and pharmacological targets of

metabolic diseases such as obesity and diabetes.

Materials and methods

for this purpose, enzyme inhibition bioassays of lipase, α-glucosidase and dipeptidyl peptidase-4 were

carried out in cell-free systems. Similarly, adipocytes derived from 3T3-L1 cells were employed to study the

effects of ellagic acid, punicalagin and urolithin A on adipocyte differentiation and triglyceride (TG)

accumulation.

Results

pomegranate juice, ellagic acid, punicalagin and urolithin A were able to inhibit lipase, α-glucosidase and

dipeptidyl peptidase-4. Furthermore, all tested compounds but significantly the metabolite urolithin A

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