

# Jordan University of Science and Technology

## Pomegranate and type 2 diabetes

**Authors:** Saleem Banihani, Samer Swedan, Ziyad Alguraan

**Abstract:** Over the last decade, various studies have linked pomegranate (*Punica granatum* Linn), a fruit native to the Middle East, with type 2 diabetes prevention and treatment. This review focuses on current laboratory and clinical research related to the effects of pomegranate fractions (peels, flowers, and seeds) and some of their active components on biochemical and metabolic variables associated with the pathologic markers of type 2 diabetes. This review systematically presents findings from cell culture and animal studies as well as clinical human research. One key mechanism by which pomegranate fractions affect the type 2 diabetic condition is by reducing oxidative stress and lipid peroxidation. This reduction may occur by directly neutralizing the generated reactive oxygen species, increasing certain antioxidant enzyme activities, inducing metal chelation activity, reducing resistin formation, and inhibiting or activating certain transcriptional factors, such as nuclear factor  $\kappa$ B and peroxisome proliferator-activated receptor  $\alpha$ . Fasting blood glucose levels were decreased significantly by punicalagin, methanolic seed extract, and pomegranate peel extract. Known compounds in pomegranate, such as punicalagin and ellagic, gallic, oleanolic, ursolic, and uallic acids, have been identified as having antidiabetic actions. Furthermore, the juice sugar fraction was found to have unique antioxidant polyphenols (tannins and anthocyanins), which could be beneficial to control conditions in type 2 diabetes. These findings provide evidence for the anti-diabetic activity of pomegranate fruit; however, before pomegranate or any of its extracts can be medically recommended for the management of type 2 diabetes, controlled, clinical studies, are needed.