

Effect of Prunin on 3T3L1 Mouse Adipocytes Differentiation in Obesity

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SUMMARY. Diabetes is a condition of high glucose content in blood which leads to several other complications like obesity, cardiac irregularities and artery problems. The objective of present study to evaluate anti diabetic, anti-obesity and antioxidant properties of prunin through different *in vitro* assays. Prunin was evaluated for various *in vitro* tests to access the therapeutic effect against adipogenesis in 3T3L1 mouse adipocytes and different enzyme inhibition assays. The cytotoxicity of prunin was also determined by the cell proliferation assay. Prunin showed dose dependent reduction in triglycerides content in an assay. The treatment in differentiated adipocytes showed an increased ($p=0.0169$) lipolysis as measured by the release of glycerol. Prunin did not exhibit any cytotoxic effect on adipocytes. The study concludes that prunin inhibits lipogenesis in adipocytes, antagonizes PPAR- γ and other lipogenic factors. It also accelerates triglyceride mobilization from the fat cells or enhances lipolysis. The other results different *in vitro* enzyme inhibition was also found significant effective and showed inhibition of enzymes involved in obesity and diabetes.

RESUMEN. La diabetes es una condición de alto contenido de glucosa en la sangre que conduce a varias otras complicaciones como la obesidad, irregularidades cardíacas y problemas arteriales. El objetivo del presente estudio es evaluar las propiedades antidiabéticas, antiobesidad y antioxidantes de la prunina a través de diferentes ensayos *in vitro*. Prunina fue evaluada para varias pruebas *in vitro* para acceder al efecto terapéutico contra la adipogénesis en adipocitos de ratón 3T3L1 y diferentes ensayos de inhibición enzimática. La citotoxicidad de la prunina también se determinó mediante el ensayo de proliferación celular. Prunina mostró una reducción dependiente de la dosis en el contenido de triglicéridos en un ensayo. El tratamiento en adipocitos diferenciados mostró un aumento ($p=0,0169$) de la lipólisis medida por la liberación de glicerol. Prunina no mostró ningún efecto citotóxico sobre los adipocitos. El estudio concluye que la prunina inhibe la lipogénesis en adipocitos, antagoniza PPAR- γ y otros factores lipogénicos. También acelera la movilización de triglicéridos de las células grasas o mejora la lipólisis. Los otros resultados diferentes de inhibición de enzimas *in vitro* también se encontraron significativamente efectivos y mostraron inhibición de enzimas involucradas en la obesidad y la diabetes.

INTRODUCTION

Obesity and diabetes both are the metabolic disorder which leads to various health issue in all ages of population and may become a leading cause of death worldwide. About, 2.8 million adults die every year due to overweight or obese ¹. Scientifically, it is a state of the imbalance between food intake and energy utilization in the human body and there are multiple or co existing reasons are responsible for this like excess food energy intake, absence of physical activity, and genetic suscepti-

bility, while some cases are caused due to genes, endocrine disorders, medications and psychiatric illness ^{1,2}. The peoples in an age of 30 or having body mass index 40 or higher are more risk to develop it or other associated disease, *i.e.* diabetes, hypertension, dyslipidemia, asthma, arthritis, and poor health status, as compared to normal weight individuals ³. Pathologically, obesity is a state of adipocytes which are in hyperplastic type of cellular adaptation and store the large amount

KEY WORDS: adipocyte differentiation, prunin, 3T3L1 cells.

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