

Lipid Induced-EV Proteins and their Association to Diabetic Kidney Disease

Abstract

Abnormal lipid metabolism in association with type 2 diabetes, plays a major role in the development of diabetic kidney disease (DKD). Lipotoxicity, an accumulation of intracellular lipid metabolites, has been proposed as a mechanism which mediates renal tubulointerstitial damage. Extracellular vesicles (EVs) are cell secreted molecules that are believed to be vital in mediating intracellular communication and immune regulation. Our lab investigated the effect of fatty acids on EVs released from cultured renal proximal tubular cells (PTCs). NRK-52E cells were treated with palmitic acid (PA) and 1% BSA. Secreted EVs were isolated through ultracentrifugation and proteins were identified using liquid chromatography, electrospray mass spectrometry (LC-ESI-MS/MS). Our results indicate PA dose-dependently increases EV production. Additionally, protein pathways with known DKD associations were identified from EVs via the Metacore Analysis Program and literature search. Furthermore, the novel pathways and mechanisms discussed can serve as rationale to further evaluate PA-induced apoptosis and injury in renal tubular cells.