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Epigenetic regulation in obesity-related kidney disease

Chronic kidney disease (CKD) is a major health burden largely driven by obesity and diabetes. 30-40% of patients with diabetes develop CKD due to unknown reason. Metabolic perturbations in the intrauterine environment also predispose offspring to CKD. In this study, we aimed to i) determine whether epigenetic regulation, specifically DNA methylation is responsible for CKD development and ii) whether modification of DNA methylation can reduce CKD due to obesity or maternal obesity. We completed a longitudinal study using a high fat-fed animal model, we previously demonstrated to induce features of type-2 diabetes by 9 weeks (adolescence) and significant renal structural damage and albuminuria in 30-40% of the animals by 32 weeks (adulthood), reflecting human epidemiology. Blood was collected at 9 and 32 weeks and DNA methylation was determined in animals with progressive and non-progressive CKD using RRBS. Kidney pathology was assessed at 32 weeks. Biometric and metabolic parameters, gene methylation profile in the kidneys and markers of renal function and pathology including oxidative stress, inflammation and fibrosis were determined. The role of epigenetic modulators to limit obesity and maternal obesity-related CKD was examined.

Keywords: Obesity, Kiney disease, epigenetic, biomarkers.

Biography

Associate Professor Saad's research interest is in metabolic and kidney disease. She has been studying the mechanisms of chronic kidney disease (CKD) development and progression for over 20 years. She published over 130 peer reviewed manuscripts in the research area. Her research program employs different strategies to investigate the origin of CKD, the mechanisms of its development and novel preventative measures/therapies for CKD. She has expertise in maternal programming and biomarkers studies and is currently developing novel non-invasive diagnostic methods to identify early kidney pathology as well as patients with progressive disease. She has multiple leadership roles and scientific boards.