PREVENTION OF OBESITY-LINKED RENAL DISEASE: EFFECTS OF BMP-7 PROTEIN EXPRESSION

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ABSTRACT

The obese Zucker rat (ObZ) fed ad libitum develops the metabolic syndrome, glomerular and tubular injury, and early death from kidney disease. Results from our laboratory showed that mRNA and protein levels of transforming growth factor-Beta are up-regulated in the ObZ rat compared to lean littermates by 12 weeks of age. Limiting food intake in the ObZ animals to that consumed by lean rats prevented this increase in TGF-Beta gene expression as well as subsequent kidney injury. Other studies suggest that administration of exogenous bone morphogenic protein-7 (BMP-7) can prevent chronic tubulointerstitial disease (CTID), possibly related to inhibition of TGF-Beta. CTID is a hallmark of obesity-linked kidney disease. Since food restriction prevents obesity-linked increases in TGF-Beta and prevents kidney disease, we hypothesized that BMP-7 production would be diminished in the obese rat compared to lean. We further hypothesized that food restriction in the obese rat later in life after kidney damage was underway would lead to enhanced BMP-7 production and prevention of injury.