**Glucomannans alleviated the progression of diabetic kidney disease by improvement of kidney glucose, lipids, amino acids metabolism and urea cycle**

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(**Oral Presentation，Presenter：Haihong Chen，\*Corresponding author**)

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This study was carried out to evaluate the kidney protective effects of [glucomannan](../AppData/Local/youdao/dict/Application/6.3.69.8341/resultui/frame/javascript%3Avoid%280%29)s from *Dendrobium officinale* stem, konjac and *Aloe vera* leaves on type 2 diabetic model rats and its potential bioactivity mechanisms. Biochemical pathological and metabolomics analysis were applied to investigate the protective effects of the three kinds of glucomannans on type 2 diabetic rats kidney. The concentrations of fasting blood glucose, serum insulin and glycated serum protein were significantly decreased with the treatment of glucomannan. The levels of serum lipids including total cholesterol, triacylglycerols, low-density lipoprotein cholesterol and non-esterified fatty acid were significantly decreased after the administration of glucomannans. Furthermore, glucomannans treatment significantly decreased the uric acid, creatinine, urea in serum, and also reduced the glucose, ketone body and protein in urine. Histopathological analysis showed that glucomannans treatment could normalize the architecture of glomerulus. Metabolomic analysis found that glucomannans treatment could balance the disturbance of urea cycle, metabolism of lipid, glucose, amino acids. Especially, konjac glucomannan treatment was more effective in lipid and glucose regulation, glucomannan from Dendrobium officinale was more efficiently in balancing urea cycle and amino acid metabolism. The disturbance of lipid, glucose and amino acid metabolism played an important role in the advancement of diabetic kidney disease and glucomannan treatment was efficiently in preventing the progression of diabetic kidney disease. These results may provide a new insight for investigating the effects and applications of [glucomannan](../AppData/Local/youdao/dict/Application/6.3.69.8341/resultui/frame/javascript%3Avoid%280%29) on type 2 diabetic kidney disease protection.