



Diabetic nephropathy in STZ rats

AN *IN VIVO* MODEL FOR NEPHROPATHY INDUCED BY TYPE 1 DIABETES

Model

Diabetic nephropathy (DN) is a major kidney-related complication of type 1 and type 2 diabetes. DN is an irreversible progressive chronic disease characterized by: microalbuminuria and hyperfiltration (increased glomerular filtration rate; GFR) in the early phase, glomerular hypertrophy and mesangial matrix expansion, proteinuria and renal fibrosis, and decreased GFR and renal failure in the end-stage. DN is accounting for millions of deaths worldwide.

Streptozotocin (STZ) is an anticancer drug derived from *Streptomyces achromogenes* that is clinically used in the treatment of pancreatic β -cell carcinoma.

In this model, STZ is injected in rat to induce Type 1 diabetes leading to development of renal injury with similarities to human DN.

Specie

Rat

Interest

In this model there is a rapid hyperglycemia and albuminuria but a slow development of kidney tissue injury. Its is a good model of early changes in human DN.

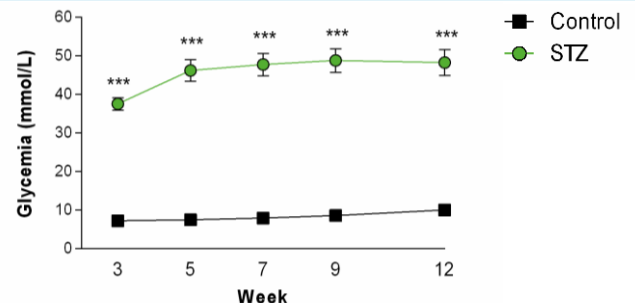
Model Description

- Diabetes is induced by a single i.v. injection of STZ
- Standard protocol duration: up to 12 weeks
- Pathophysiological features: type 1 diabetes, impaired renal function and glomerular sclerosis

Evaluated Parameters

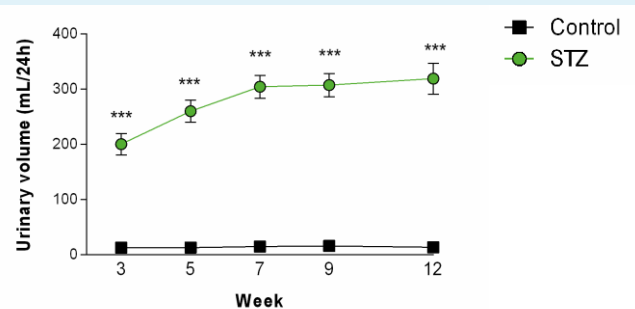
- Body and kidney weight
- Food and water intake
- Voided volume
- Metabolic changes: glycemia and plasma fructosamine
- Renal function:
 - Plasma and urinary creatinine and urea
 - Estimated and transdermal Glomerular Filtration Rate (GFR).
 - Albuminuria and proteinuria
- Glomerular sclerosis: histological analysis of glomerular matrix expansion by Periodic Acid Schiff (PAS) staining.

Hyperglycemia in STZ rats



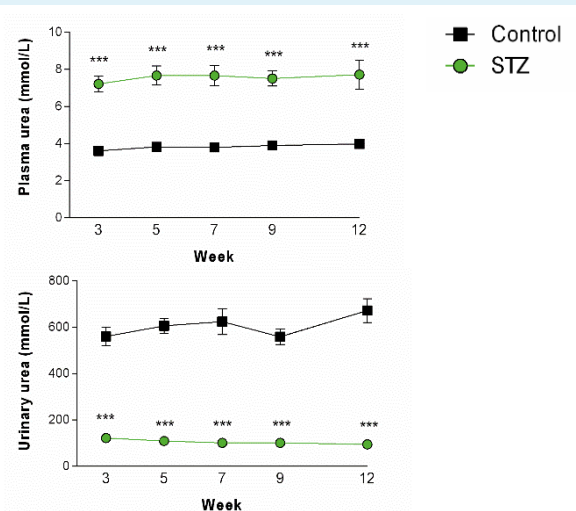
***P<0.001 (n=16-18/group, W1-9; n=7-8/group, W10-12)

Polyuria in STZ rats



***P<0.001 (n=16-18/group, W1-9; n=7-8/group, W10-12)

Impaired renal function in STZ rats



***P<0.001 (n=16-18/group, W1-9; n=7-8/group, W10-12)

Glomerulosclerosis in db/db mice (week 12)

