General Summary

Our major fields of research are nephrology, hypertension, and uric acid metabolism. Published achievements and recent reports are summarized here.

Research Activities

Nephrology

1. Glomerulonephritis

Recently, steroid pulse therapy has been recommended as a treatment for patients with progressive immunoglobulin A nephropathy. We demonstrated that steroid pulse therapy significantly decreases the severity of proteinuria. In addition, tonsillectomy, in combination with steroid pulse therapy, can induce clinical remission in patients with immunoglobulin A nephropathy.

We generated and analyzed inducible and podocyte-specific vascular endothelial growth factor transgenic mice using the Tet-On system. Our results indicate that dysregulation of vascular endothelial growth factor expression leads to the alteration of glomerular capillary formation via dysfunction of both endothelial and mesangial cells.

Metanephros transplantation significantly reduced vascular Ca and Pi content. Von Kossa staining of the media of the thoracic aorta indicated that metanephros transplantation suppresses the progression of vascular calcification.

2. Dialysis and kidney transplantation

We evaluated the clinical value of combined therapy with peritoneal dialysis and hemodialysis and found that it is a useful way of controlling body fluids and that peritoneal function can be maintained over a long period of treatment time (Clinical Nephrology, 2010). Moreover, we evaluated peritoneal histology. In addition, we studied vascular calcification in patients with end-stage renal disease (Clinical Nephrology, 2010).

We studied acute humoral rejection and attempted to perform ABO-incompatible renal transplantation and husband-to-wife renal transplantation. In transplant glomerulopathy, glomerular expression of plasmalemmal vesicle-associated protein 1 is positively correlated with the severity of transplant glomerulopathy and proteinuria (American Journal of Transplantation, 2008). We found an association between peritubular capillary endothelial c-Jun activation and interstitial fibrosis in chronic antibody-mediated rejection.
Hypertension

A study of awareness of home blood pressure (BP) measurement among practitioners who deal with hypertension was a main research project in 2010. This study was unique in that it focused specifically on home BP measurement. Because the guidelines released by the Japanese Society of Hypertension in 2008 are the only guidelines to include home-based BP, we believe highlighting the importance of home-based BP measurement is important. The study has been completed and was submitted to the journal Blood Pressure.

In patients with chronic kidney disease, T-type calcium channels can be overexpressed in the kidney. In addition, blocking of T-type calcium channels leads to inhibition of Rho-kinase activity and renal interstitial. We extended this result to further investigate the cardiorenal continuum by introducing 5/6 nephrectomized rats. We are now analyzing laboratory and histological findings.

Uric acid metabolism

We investigated the hypouricemic effect of a novel synthesized xanthine oxidase inhibitor, topiroxostat, in patients who have hyperuricemia with and without gout. Topiroxostat showed dose responsiveness in its ability to lower serum levels of uric acid, and doses of both 80 mg and 120 mg produced significantly greater increases in estimated glomerular filtration rate than did placebo.

Publications


Reviews and Books