

## Role of Transferrin Receptor 1 in Salt Sensitive Hypertension

Yoshiro Naito, Tohru Masuyama

Hyogo College of Medicine

### Summary

**Background:** Cellular iron transport protein, transferrin receptor 1 (TfR1) is required for the uptake of transferrin-bound iron into the cells. Previous reports have shown that iron accumulation is associated with the pathophysiology of cardiovascular disease; however, the role of TfR1 in the pathophysiology of hypertension remains unknown.

**Methods and Results:** First, to investigate the functional importance of TfR1 in the pathophysiology of hypertension, we subjected to 5/6 nephrectomy in TfR1 hetero knockout mice. Of interest, urinary albumin excretion, serum BUN levels, and serum creatinine levels were increased to a lesser extent in TfR1 hetero knockout mice compared with wild-type (WT) mice. Second, we assessed the functional role of TfR1 in human artery smooth muscle cells *in vitro*. The depletion of TfR1 by RNA interference attenuated human artery smooth muscle cells proliferation induced by platelet-derived growth factor-BB. Finally, we assessed aortic TfR1 expression in human abdominal aortic aneurysm (AAA) walls. Both Western blot and immunohistochemical analyses revealed that TfR1 expression is increased in human AAA walls compared with non-AAA walls.

**Conclusions:** These results indicate that TfR1 plays a role in the pathophysiology of hypertensive organ damage. Understanding the role of TfR1 in the pathophysiology of hypertensive organ damage may lead to a novel therapeutic approach for hypertensive organ damage.