Production of Nerve Growth Factor in Cultured Vascular Smooth Muscle Cells from Genetically Hypertensive rats. Takashi Ueyama, Masanori Hamada*, Takuzo Hano*, Ichiro Nishio*, Shoei Furukawa** Department of Anatomy and Neuroscienc, Wakayama Medical College, *Division of Cardiology, Department of Medicine, Wakayama Medical College, Wakayama, 640, Japan. **Department of Molecular Biology, Gifu Pharmaceutical University, Gifu, 502, Japan.

Nerve growth factor (NGF) is a neurotrophic peptide for peripheral sympathetic nerves. Sympathetic hyper-innervation and corresponding increased level of NGF and NGF mRNA were demonstrated in Spontaneously hypertensive rats (SHR: Aoki-Okamoto strain). Otago genetically hypertensive rats (GH) is the strain which develops hypertension without any manipulation. Though the contribution of sympathetic nervous system to the development of hypertension has been demonstrated by sympathectomy (Circ Res 28, 330, 1971), hypoplasia of sympathetic nerve ganglia and reduced content of neuropeptide Y were reported in GH (Hypertens 16, 63, 1990; Neuroreport 2, 45, 1991). These facts led us to consider that production of NGF might be altered in GH cells. The aim of this study was to compare the amount of NGF secreted from cultured Vascular Smooth Muscle Cells (VSMC) derived from GH and its control N rat.

GH rat and N rat were kindly supplied from Otago Medical School (Dunedin, NZ). VSMC, prepared from the aortic media of 12-week-old GH rats and age-matched N rats by enzyme digestion method were subcultured in Dulbeccos' modified Eagle medium (DMEM) containing 10% of fetal calf serum. The NGF content in the medium was measured using an enzyme immunoassay against mouse beta NGF.

VSMC from GH and N exhibited exponential growth rates, reaching plateau at culture 10 days. Growth rates and the maximum cell density were quite equivalent between GH cells and N cells. The total amount of NGF secreted was higher in N cells in every periods. NGF secretions from VSMC of GH were $1.2 \text{ pg}/10^4 \text{ cells}/48 \text{ h}$ in the progressive phase and $0.7 \text{ pg}/10^4 \text{ cells}/48 \text{ h}$ in the quiescent phase, while those of N were $8 \text{ pg}/10^4 \text{ cells}/48 \text{ h}$ and $1 \text{ pg}/10^4 \text{ cells}/48 \text{ h}$, respectively. The levels of NGF secretion per cells were also greater in N cells.

In summary, NGF secretion from VSMC were reduced in GH. These results raise the possibility that abnormality in NGF production from VSMC might be involved in hypoplasia of sympathetic nerve cells in GH.