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## The Analysis of Physiological Roles of Ghrelin in Salt Sensitive Hypertension

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### Summary

Ghrelin is an endogenous ligand for the growth hormone secretagogue receptor that is synthesized predominantly in the stomach. Ghrelin stimulates growth hormone release, food intake, and fat deposition and the abnormal secretion of ghrelin is a trigger of a metabolic syndrome. On the other hand, ghrelin receptor distributes in the heart, kidney and brain stem that are the important tissues for vasoregulation. Then, we investigated the physiological roles of ghrelin in salt sensitive hypertension.

We used the ghrelin-deficient mice and the salt sensitive (Dahl-Iwai) rats in this study. The circadian blood pressure rhythm of ghrelin-deficient mice was a little bit abnormal analyzed by telemetry system. In addition, the blood pressure of ghrelin-deficient mice was high in the light phase when the mice take a rest. However, there were no differences in the *Per2* gene expression of the suprachiasmatic nucleus and in the circadian behavioral rhythm, indicating that the biological clock center was normal. These results implied that ghrelin might modulate autonomic nervous activity. By ghrelin administration in wild type mice, the sympathetic nervous activities were certainly suppressed. Under the salt sensitive hypertension in Dahl rats, plasma ghrelin and ghrelin gene expression were increased. Then, we thought that ghrelin might develop the salt sensitive hypertension. However, the ghrelin receptor agonist had no effect on hypertension although we administrated the agonist by osmotic mini-pump. In this condition, the endogenous ghrelin content was low level. On the other hand, the administration of ghrelin receptor antagonist induced the early elevation of blood pressure. However, this early elevation was suppressed with the disappearance of the antagonist effect. Therefore, it might be appropriate to think that ghrelin suppressed the elevated blood pressure with salt sensitive hypertension.

Our results may indicate that the ghrelin control the salt sensitive hypertension by suppressing a part of the sympathetic nerve activity.