

Acute intracerebroventricular injection of chemerin-9 increases systemic blood pressure via CMKLR1 in rats

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Chemerin is an inflammatory adipocytokine through acting on G protein-coupled receptor, chemokine-like receptor (CMKLR)1. We previously demonstrated that long-term intraperitoneal administration with chemerin increased systolic blood pressure (BP) in mice. Since important nuclei regulating BP exist in the brain, we examined mechanisms of central BP control by chemerin-9.

BP was invasively measured after acute intracerebroventricular (i.c.v.) injection of chemerin-9 to CMKLR1 siRNA-treated rats for 3 days. Serum adrenaline was measured by HPLC method. CMKLR1 expression in the brain tissues of spontaneously hypertensive rat (SHR) was examined by Western blotting.

In the control siRNA-treated rats, chemerin-9 significantly increased mean BP, while it had no effect in the CMKLR1 siRNA-treated rats. Serum adrenaline level was increased by the acute i.c.v. injection of chemerin-9. CMKLR1 expression around brain ventricles from SHR was increased.

We for the first time demonstrated that chemerin-9 stimulates the sympathetic nerves via CMKLR1 expressed around brain ventricles, which leads to an increase in BP. It is further suggested that chemerin/CMKLR1 in the central nerves plays an important role in essential hypertension.