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SYMPATHETIC NERVE-MEDIATED SUPPRESSION OF
SPLENIC LYMPHOCYTE FUNCTION BY VENTROMEDIAL
HYPOTHALAMIC STIMULATION IN RATS

Shiki OKAMOTO

*Laboratory of Biochemistry,
Department of Biomedical Sciences,
School of Veterinary Medicine,
Hokkaido University, Sapporo 060, Japan*

It has been recognized that peripheral immune functions are modified by the central nervous system, as typically exemplified by immunosuppression induced by various types of stressors. In this study, to investigate the role of the hypothalamus in the control of peripheral immune functions, I examined the effect of electrical stimulation of some regions of the hypothalamus on the mitogenic activity of splenic lymphocytes in rats. To do this, electrical stimuli were applied to the hypothalamus for 2 sec every 30 sec through a chronically implanted electrode and 30 min later lymphocytes were isolated from the spleen, and their mitogenic response to concanavalin A was assayed *in vitro*. Stimulation of the ventromedial hypothalamus (VMH) showed a remarkable decrease in the mitogenic response, whereas stimulation of other hypothalamic regions, including the paraventricular nucleus (PVN), did not show any significant effects. A similar suppressive effect of VMH stimulation was also found in adrenalectomized rats, suggesting a minor role of the adrenocortical system in mediating the VMH action in the spleen. In contrast, pretreatment with a ganglionic blocking agent, chlorisondamine, or a β -adrenergic receptor antagonist, propranolol, reversed the suppressive effect of VMH stimulation. Surgical severing of the splenic nerves also reversed the effect. These results indicate that VMH stimulation suppresses the mitogenic response of splenic lymphocytes through the activation of sympathetic nerves via the β -adrenergic pathway.