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cFos Expression in the Forebrain Following Central Administration of Nociceptin in Heart Failure

Helmut Gottlieb,[1] Julie Coldwater,[2] Alexa Torres,[2] Amelia Johnson,[2] Karimeh Ortiz,[3] Cynthia Franklin,[4] Bao Le,[2] Jeffrey Angell,[5] and Jessica Bradley[3]

[1]Univ of Incarnate Word Feik School of Pharmacy; [2]UIW Feik School of Pharmacy; [3]UIW School of Osteopathic Medicine; [4]UIW School of Pharmacy; and [5]Univ of the Incarnate Word

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Activation of the central opioid like peptide, nociceptin (N/OFQ), in conscious rats produces a marked decrease in blood pressure, heart rate, renal sympathetic nerve activity with a concurrent diuretic response. N/OFQ produces its neuronal inhibitory effects in part via the inhibition of cyclic AMP through ORL-1 G-protein coupled receptor. The present study examines the effects of intracerebroventricular (ICV) injection of N/OFQ (5 nmol) on cFos staining in forebrain regions that are involved in cardiovascular and renal function. Heart Failure (HF) was induced by a myocardium infarction model. HF and Sham surgery animals were given N/OFQ or saline vehicle ICV. N/OFQ treated animals produced a significant diuretic and anti-natriuretic effect as compared with saline treated animals. In addition, forebrain sections were processed for cFos using polyclonal antibody (anti-rabbit). HF produced significant increases in cFos staining in the paraventricular nucleus of the hypothalamus (PVN) and supraoptic nucleus (SON) as compared to Sham control animals. In contrast, cFos expression decreased in the magnocellular PVN and SON. Together, central ORL-1 receptor mediated responses in these magnocellular and parvocellular regions may contribute to the cardio-renal effects of N/OFQ.

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