NEUROIMMUNE CROSSTALK: A ROLE FOR NEUROPEPTIDE Y IN INFLAMMATORY BOWEL DISEASE

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ABSTRACT

Neuropeptide Y (NPY) is a 36-amino acid peptide widely expressed in the central and peripheral nervous systems. In addition to other nerve cells, NPY is also synthesized and co-released from sympathetic nerve fibers functioning as a potent sympathetic neuromodulator. NPY has been implicated in playing important roles in the regulation of energy balance, appetite, anxiety, vascular tone, and immune cell functioning. In addition, immune cells of both the innate and adaptive immune systems express functional NPY receptors, some immune cells can produce and secrete NPY and genetic alteration of these receptors results in altered immune cell functioning. Its direct association with the immune system, its presence in sympathetic neurons innervating primary and secondary immune organs and its close association with vasculature, make NPY a candidate for mediating, at least in part, the neuroimmune crosstalk. In light of the direct regulation of immune cells, the role of NPY in inflammatory diseases has recently been explored. In particular, NPY signaling via its Y₁ receptor has been suggested to mediate DSS-induced colitis, an experimental model of inflammatory bowel disease. The two NPY receptors most closely associated with immunity are Y₁ and Y₂. The potential role of Y₂ in DSS-induced colitis has yet to be determined. This aims to replicate the findings of the role of Y₁ in DSS-induced colitis and expand this analysis to address a potential role of Y₂ in the same model.