Neuropeptides as therapeutic approach to autoimmune diseases.

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Abstract

Because there are no particular molecular signatures of self, autoimmunity is the inevitable evolutionary price of being able to make effective responses against a wide variety of pathogens by the immune system. Without the various phenomena referred to as immune tolerance, the organism would surely self-destruct. Considerable evidence suggests that various endogenous neuropeptides play a major role in the education of our immune system to be self-tolerant. The fact that neuropeptides regulate various layers involved in maintenance of tolerance, including regulation of the balance between pro-inflammatory and anti-inflammatory responses and between self-reactive Th1/Th17 cells and regulatory T cells, makes them attractive candidates for the development of new therapies for the treatment of autoimmune disorders. Here we use the vasoactive intestinal peptide of a prototype of immunomodulatory neuropeptide to review the most relevant data found for other neuropeptides with similar characteristics, including melanocyte-stimulating hormone, urocortin, adrenomedullin, neuropeptide Y, cortistatin and ghrelin. We also evaluate the challenges that must be overcome before achieving their clinical application and offer our opinion on how a physiologically functional neuropeptide system contributes to general health.

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