

Neuronal Regulation of Interleukin 6 Secretion in Murine Spleen: Adrenergic and Opioidergic Control

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KEYWORDS

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ABSTRACT

Abstract: The PNS was anticipated to be involved in the modulation of immune responses. To study aspects of this neuronal-immune communication, a recently developed tissue slice method was used to study the effects of adrenergic and opioidergic transmitters on interleukin 6 (IL-6) secretion in the spleen. The α_2 -adrenergic agonist *p*-aminoclonidine ($10^{-7}M$) inhibited IL-6 secretion (control vs. *p*-aminoclonidine, 100.0 ± 4.76 vs. $59.3 \pm 6.6\%$ of control values; $p < 0.001$). The α_1 -adrenergic agonist methoxamine ($10^{-8}M$) also inhibited IL-6 secretion (100.0 ± 4.8 vs. $71.5 \pm 3.8\%$; $p < 0.001$). The endogenous opioids β -endorphin ($10^{-10}M$), methionine-enkephalin ($10^{-9}M$), and leucine-enkephalin ($10^{-9}M$) inhibited IL-6 secretion as well ($p = 0.0051$, $p = 0.0337$, and $p = 0.0226$, respectively). Electrical stimulation of spleen slices inhibited IL-6 secretion (100.0 ± 4.3 vs. $56.7 \pm 4.6\%$ of control values; $p < 0.001$). The involvement of α -adrenergic and opioidergic molecules in this electrically induced inhibition was shown by the use of antagonists. Electrical inhibition of IL-6 secretion was attenuated by phentolamine ($10^{-7}M$; $p = 0.0345$), by naloxone ($10^{-6}M$; $p = 0.0046$), by cyprodime ($10^{-8}M$; $p = 0.0014$), and by the combination of cyprodime ($10^{-7}M$) plus phentolamine ($10^{-8}M$; $p < 0.0001$). We conclude from the complementary studies that the inhibition of IL-6 secretion induced by electrical pulses was mostly mediated by α -adrenergic and μ -opioidergic endogenous transmitters.

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