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Neuro-immune interactions in the cholinergic anti-inflammatory reflex.

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Highlights:

- **A concise history of the cholinergic anti-inflammatory pathway**
- **New challenges and opportunities in the study of neuro-immune communication**
- **Controversies in the functional circuitry and mechanisms of action**

Abstract:

Communication between the nervous and immune systems can significantly alter immune cell function in a number of inflammatory diseases. Elegant studies have defined a basic functional circuit in a “cholinergic anti-inflammatory pathway” that highlights a unique role for the vagus nerve, and has brought about a resurgence in the field of neuro-immunology. This research has further identified that in addition to tonic signals that can restrain immune cell activation; the anti-inflammatory reflex arc is amiable to targeted stimulation as a therapeutic modality. The success of vagal electrical neural stimulation in a plethora of pre-clinical inflammation models has spurred the development of “electroceuticals” or neurostimulatory