NORTHERN HEALTH RESEARCH CONFERENCE

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The Role of Non-Neuronal Acetylcholine Production in Immune Cells

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ABSTRACT:
The cholinergic system deals with the production, function, and degradation of acetylcholine (ACh), a molecule commonly known as a neurotransmitter. This system has been shown to modulate inflammation through the cholinergic anti-inflammatory pathway by stimulating the vagus nerve. Although increasing evidence suggests its importance in immune cells, its role within such cells remains elusive. Assessing the presence of cholinergic markers in immune cells in addition to pharmacological studies utilizing inhibitors of such markers will thus help to elucidate the functional roles of the cholinergic system in the immune response. More specifically, the aim of this study is to evaluate the role of non-neuronal ACh production in immune regulation. Expression studies using qPCR, western blots, mass spectrometry, and immunocytochemistry revealed the presence of cholinergic markers important for ACh production in immune tissues and within immune cells of such tissues. In addition, the effect of cholinergic inhibitors on immune function was examined with cytokine profiles and immune cell phenotypes of bone marrow derived macrophages and spleenocytes. These pharmacological experiments suggested that cholinergic markers play a role in immune regulation. Hence, the cholinergic system seemingly modulates inflammation within immune cells.