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Letter to Editor Open Access

Focus on Enteric Neurons and Mucosal Mast Cells in Neuro-Immune Crosstalk and Food Allergy

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Letter to Editor

Individually, the nervous system and immune system play critical roles in controlling the processes required to maintain physiological homeostasis, respond to acute stress, and defend against external threats. These two regulatory mechanisms for keeping the live body were once thought to work separately. Allergies are caused by the immune system's overreaction to items that are relatively harmless to the body, such as food, pollen, and dust mites. As a result, it has long been assumed that an immunological interpretation might explain the emergence and pathophysiology of allergies. Neuro-immune crosstalk, on the other hand, has recently gotten a lot of attention.

As a result, it's becoming obvious that neurons and immune cells in many peripheral tissues have close morphological closeness and physiological and pathological connections. As a result, scientists are beginning to recognise that neuro-immune interactions may play a role in tissue homeostasis and the pathophysiology of immune-mediated disease, but there is still a lack of knowledge about the molecular basis of these interactions. Mast cells are innate immune cells that play a role in allergic reactions as well as the control of host–pathogen interactions. Mast cells are present throughout the body, and they are frequently located in close proximity to nerve fibbers in numerous tissues, including the intestine's lamina propria. Mast cells and neurons are hypothesised to communicate in a bidirectional manner in order to modify neurophysiological consequences and mast cell behaviour.

Dietary allergy (FA) is an aberrant immune response to food proteins, and the number of patients diagnosed with FA has risen dramatically in recent decades. Despite the fact that FA is becoming more common, the pathogenic mechanisms that cause it are yet unknown. As a result, therapy choices are limited, and there are no effective pharmacological therapies for FA. Mast cells play a variety of physiological tasks, including innate defence against infections such as parasite infections, adaptive immune modulation, and tissue homeostasis, while they are best known for their pathophysiological role in allergy disorders. 4 In the morbid situation, Mast cells are frequently positioned close to the external environment to respond to pathogens in the cell-shifted immunological milieu, and mast cells play a crucial role as effector cells and conductor cells in the pathophysiology of numerous allergic disorders [1-5].

In a mouse FA model, PI3K p85 subunit-deficient mice that lack intestinal mast cells but have abundant cutaneous mast cells fail to develop FA, demonstrating that mast cells in the intestine are required for the formation of FA. In both immunology and neurobiology, the study of neuro-immune interaction has become a hot topic. In peripheral tissues, a positive feedback loop between the neurological system and the immune system promotes even more robust immune responses to infections and antigens. This immune-enhancing system, on the other hand, is prone to creating excessive immune responses and reactions to harmless antigens, such as dietary antigens and indigenous microorganisms, which can lead to health issues like allergy disorders and inflammatory diseases. Future research may reveal how the neural and immune systems delicately coordinate numerous elements of homeostatic control, as well as how the immunological and neurological systems are engaged in the pathophysiology of allergic disorders, perhaps revealing treatment targets for MMC-related diseases.

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