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Immunological Disorders and Immunotherapy

Short Communication

Future of Autoimmune Disease Treatment: Customized Therapies with Memory Tregs

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ABOUT THE STUDY

Autoimmune diseases occur when the body's immune system mistakenly attacks its own healthy cells, leading to chronic conditions such as rheumatoid arthritis, lupus and multiple sclerosis. Traditionally, autoimmune therapies have focused on suppressing the immune system to prevent it from causing damage. However, recent findings suggest that a new approach may allow for more targeted, effective treatments with fewer side effects. The study, conducted by a team of scientists at a leading medical research institute, focuses on a novel mechanism by which the immune system behaves in autoimmune conditions. The breakthrough centers around a newly identified type of immune cell and its role in modulating inflammation. This discovery could potentially shift the way autoimmune disorders are treated, paving the way for therapies that not only suppress harmful immune responses but also encourage the immune system to restore balance.

The immune system and autoimmune diseases

At the core of autoimmune diseases is a malfunction in the immune system. The immune system, which is designed to protect the body from harmful invaders such as viruses and bacteria, becomes confused and starts attacking the body's own tissues. In diseases like rheumatoid arthritis, this results in joint inflammation and destruction, while conditions like type 1 diabetes involve immune cells attacking insulin-producing cells in the pancreas [1]. Existing treatments, such as corticosteroids and immunosuppressant, are designed to dampen the immune response. However, these therapies come with significant risks, including an increased susceptibility to infections, cancer and other health complications.

Role of a newly identified immune cell

The breakthrough centers on a previously underappreciated type of immune cell known as regulatory T cells (Tregs). Tregs play a vital role in maintaining immune system balance by suppressing excessive immune responses [2]. In autoimmune diseases, Tregs often fail to function correctly, leading to the overactive immune response that causes tissue damage. However, the study revealed that a specific subset of Tregs-known as memory Tregs-may be able to effectively control autoimmune reactions without the need for broad immune suppression [3].

These memory Tregs were found to have a unique ability to recognize and respond to specific immune system triggers associated with autoimmune diseases. Unlike conventional Tregs, which primarily act as a "brake" on the immune system, memory Tregs can adapt their responses based on previous encounters with these triggers. This allows them to provide a more targeted and dynamic defense, potentially offering a way to correct immune imbalances without compromising overall immune function [4,5].

Potential implications for autoimmune therapy

The implications of this discovery are significant. Traditional treatments for autoimmune diseases are often blunt instruments that indiscriminately suppress the immune system, leaving patients vulnerable to infections and other illnesses [6]. The identification of memory Tregs offers the possibility of a much more precise and controlled treatment approach. By enhancing the activity of these cells, scientists could develop therapies that target the underlying causes of autoimmune disease with fewer side effects [7].

For example, researchers could potentially use gene editing or other techniques to encourage the development of more effective memory Tregs in patients. Alternatively, treatments could be designed to stimulate the existing Tregs to be more responsive to autoimmune triggers [8]. This approach would allow patients to maintain a functional immune system while avoiding the harmful effects of autoimmune reactions [9].

Additionally, the discovery opens the door to personalized therapies. Since memory Tregs can be customised to respond to specific autoimmune triggers, it may be possible to design individualized treatments that are uniquely suited to each patient's condition [10]. This could drastically improve outcomes

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for patients who have not responded well to conventional treatments.

REFERENCES

1. Geis C, Planaguma J, Carreno M, Graus F, Dalmau J. Autoimmune seizures and epilepsy. J Clin Invest. 2019;129(3): 926-940.
2. Dalmau J, Armangue T, Planaguma J, Radosevic M, Mannara F, Leypoldt F, et al. An update on anti-NMDA receptor encephalitis for neurologists and psychiatrists: Mechanisms and models. Lancet Neurol. 2019;18(11):1045-1057.
3. Titulaer MJ, McCracken L, Gabilondo I, Armangue T, Glaser C, Iizuka T, et al. Treatment and prognostic factors for long-term outcome in patients with anti-NMDA receptor encephalitis: An observational cohort study. Lancet Neurol. 2013;12(2):157-165.
4. Scheffer IE, Berkovic S, Capovilla G, Connolly MB, French J, Guilhoto L, et al. ILAE classification of the epilepsies: Position paper of the ILAE commission for classification and terminology. Epilepsia. 2017;58(4):512-521.
5. Planaguma J, Leypoldt F, Mannara F, Gutierrez-Cuesta J, Martin-Garcia E, Aguilar E, et al. Human N-methyl D-aspartate receptor antibodies alter memory and behaviour in mice. Brain. 2015;138(1):94-109.
6. Fukata M, Yokoi N, Fukata Y. Neurobiology of autoimmune encephalitis. Curr Opin Neurobiol. 2018;48:1-8.
7. Alexopoulos H, Dalakas MC. The immunobiology of autoimmune encephalitides. J Autoimmun. 2019;104:102339.
8. Lancaster E, Dalmau J. Neuronal autoantigens-pathogenesis, associated disorders and antibody testing. Nat Rev Neurol. 2012;8(7):380-390.
9. Graus F, Dalmau J. Paraneoplastic neurological syndromes. Curr Opin Neurol. 2012;25(6):795-801.
10. Dalmau J, Gleichman AJ, Hughes EG, Rossi JE, Peng X, Lai M, et al. Anti-NMDA-receptor encephalitis: Case series and analysis of the effects of antibodies. Lancet Neurol. 2008;7(12):1091-1098.