Immune checkpoint proteins are a type of cell surface proteins that regulate the immune response by controlling the activation or suppression of T cells. They are typically found on the surface of immune cells such as T cells, B cells, and antigen-presenting cells.

There are several types of immune checkpoint proteins, including programmed cell death protein 1 (PD-1), cytotoxic T lymphocyte-associated protein 4 (CTLA-4), and T cell immunoglobulin and mucin domain-containing protein 3 (TIM-3), among others. These proteins act as brakes on the immune system and help to prevent the immune response from attacking healthy cells in the body.

However, cancer cells can hijack these immune checkpoint proteins to evade destruction by the immune system. To combat this, a new class of cancer therapies known as immune checkpoint inhibitors have been developed that block the activity of these checkpoint proteins and allow the immune system to attack cancer cells more effectively.

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Immune checkpoint regulators are critical modulators of the immune system, allowing the initiation of a productive immune response and preventing the onset of autoimmunity. Co-inhibitory and co-stimulatory immune checkpoint receptors are required for full T-cell activation and effector functions such as the production of cytokines. In autoimmune rheumatic diseases, impaired tolerance leads to the development of diseases such as rheumatoid arthritis, systemic lupus erythematosus, and Sjogren's syndrome. Targeting the pathways of the inhibitory immune checkpoint molecules CD152 (cytotoxic T lymphocyte antigen-4) and CD279 (programmed death-1) in cancer shows robust anti-tumor responses and tumor regression. This observation suggests that, in autoimmune diseases, the converse strategy of engaging these molecules may alleviate inflammation owing to the success of abatacept (CD152-Ig) in rheumatoid arthritis patients. We review the preclinical and clinical developments in targeting immune checkpoint regulators in rheumatic disease [1)].

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Ceeraz S, Nowak EC, Burns CM, Noelle RJ. Immune checkpoint receptors in regulating immune reactivity in rheumatic disease. Arthritis Res Ther. 2014;16(5):469. Review. PubMed PMID: 25606596; PubMed Central PMCID: PMC4289356.