Anti-IDO2
Treatment of Rheumatoid Arthritis and Autoimmune Disorders

Lead Lankenau Institute for Medical Research Investigators

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Unmet Need

Rheumatoid arthritis (RA) is a chronic autoimmune disease that occurs when the body's immune system attacks joints, creating debilitating inflammation and pain. Left unchecked this inflammatory condition can permanently damage joint structures, and in some cases, damage the cardiovascular and respiratory systems. This systemic disease affects more than 1.5 million Americans and about 1% of the global population, with nearly three times the number of women as men.

Current treatments only ease symptoms or slow disease course. They do not target the disease itself; they simply ablate the immune system generally, elevating risks of infection, and other immune-based diseases, such as cancer.

The global market for RA therapy is expected to increase from US $1.7B in 2017 to US $2.3B in 2022,[1] according to the market information resource BCC Research.

Opportunity

LIMR's technology offers an novel mechanism-based approach to the treatment of autoimmune disease currently lacking in the field, where current management is based on a general ablation of inflammatory signals or the immune system as a whole. LIMR's cell-permeable antibody acts selectively within B cells to attenuate pathogenic autoantibody production without ablating normal immune function. Preclinical genetic and therapeutic proof of concept in mice has been established for this novel mechanism of action (see references).

Unique Attributes

The immunomodulatory enzyme IDO2, discovered by LIMR scientists, has been identified as an essential mediator of autoimmune disease. In preclinical models of rheumatoid arthritis, systemic administration with a cell-permeable monoclonal antibody developed at LIMR that specifically binds IDO2 in B cells reduced the level of autoreactive T and B cell activation and alleviated pathogenic symptoms. LIMR has defined a pathway that allows for effective targeting of intracellular antigens previously considered inaccessible to antibody-based therapies.

Clinical Applications

A disease-specific approach to the treatment of autoimmune disease.

Stage of Development

IDO2-binding antibodies are being humanized with suitable properties for clinical translation.

[1] BCC Research LLC, Wellesley, Massachusetts. 26 March 2018.

Continued on back

Intellectual Property

- IDO2 antibodies: US Patent No. 8,436,151, issued 7 May 2013
- IDO2 nucleic acid sequences: U.S. Patent No. 8,058,416, issued 15 November 2011

Collaboration Opportunity

Seeking licensee for commercialization or collaboration to advance preclinical development.

References and Publications

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- Merlo LM, DuHadaway JB, Grabler S, Prendergast GC, Muller AJ and Mandik-Nayak L. (2016). IDO2 Modulates T Cell-Dependent Autoimmune Responses through a B Cell-Intrinsic Mechanism. *J Immunol* 196: 4487-97.
- Merlo LM, Grabler S, DuHadaway JB, Pigott E, Manley K, Prendergast GC, Laury-Kleintop, LD and Mandik-Nayak L. (2017). Therapeutic antibody targeting of indoleamine-2,3-dioxygenase (IDO2) inhibits autoimmune arthritis. *Clin Immunol* 179: 8-16.

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