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TARGETED IMMUNE CELL DEPLETION FOR TREATING AUTOIMMUNE DISORDERS

THERAPEUTICS

PD-1-receptor-targeting moiety conjugated to an exotoxin for targeted pathogenic cell depletion.

TECHNOLOGY TYPE

Biologics
Antibodies
Recombinant Proteins

STAGE OF DEVELOPMENT

- Demonstrated efficacy of toxin in vitro and in vivo.

- Reversed or delayed progression of two autoimmune diseases in animal models.

IP PROTECTION

PCT filed.

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TECHNOLOGY SUMMARY

Current treatment regimens for autoimmune diseases indiscriminately target healthy and diseased immune cells, causing patient immunodeficiency. In disorders like type 1 diabetes, multiple sclerosis, and rheumatoid arthritis, there is systemic depletion of healthy cells and tissues due to the failure of regulatory checkpoints in the immune system, like the PD-1 receptor.

University of Utah researchers have developed a unique approach to specifically deplete pathogenic autoreactive immune cells that cause organ destruction. This approach uses a targeted therapeutic with a PD-1-receptor-targeting moiety conjugated to a unique exotoxin. The exotoxin enters only offending autoimmune cells to begin depletion, without targeting or affecting healthy cells. This approach has been shown to limit healthy cell exposure to the toxin and reduce autoimmune deficiency in mouse models for type 1 diabetes and experimental autoimmune encephalomyelitis.

FEATURES AND BENEFITS

- Depletes only active, pathogenic immune cells that express PD-1 receptors.
- Suppresses autoimmune tissue destruction.
- Lowers the number of side effects associated with standard autoimmune disease treatment.
- Preserves adaptive immunity.

RECENT PUBLICATIONS

Zhao, P., Wang, P., Dong, S., Zhou, Z., Cao, Y., Yagita, H., . . . Chen, M. (2019). Depletion of PD-1-positive cells ameliorates autoimmune disease. *Nature Biomedical Engineering*, 3(4), 292-305. doi: [10.1038/s41551-019-0360-0](https://doi.org/10.1038/s41551-019-0360-0)

INVENTOR PROFILE

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