Docket #: S18-061

Small Molecule Modulators of Chimeric Antigen Receptors (CAR) T Cells

Researchers at Stanford University have developed a method and composition of immunomodulatory compounds that prevent and reverse T cell exhaustion, improving on existing CAR T cell therapies.

Harnessing the immune system for developing therapeutics has demonstrated a significant benefit in various disease areas, especially against oncological indications. Consequently, immunotherapeutics have gradually gained a strong foothold in the pharmaceutical industry. Despite this, the long-term efficacy and side effects of immunotherapies, such as CAR T cells, can be precarious, hindering their wider adoption.

Now, researchers at Stanford have developed technologies with tremendous potential to overcome one common side effect of these therapies, T cell exhaustion. They identified a new class of small molecules that potently and transiently inhibit T cell activation, proliferation, and cytokine secretion. This prevented and reversed T cell exhaustion, a common side effect of immunotherapies, in mouse models. Additionally, these compounds can be administered with various genetically engineered T cells, demonstrating a wide range of potential applications. Combining these molecules with existing immunotherapies can lead to improved treatment safety and efficacy.

Stage of Development
Research - In vivo

Applications

- Combination with various CAR T cell therapies

- Transient innate T cell inhibition for improved immune function for chronic infections

Advantages

- Novel method for reversing T cell exhaustion
- Novel method for preventing T cell exhaustion

Publications

- Weber, E. W., Parker, K. R., Sotillo, E., Lynn, R. C., Anbunathan, H., Lattin, J., ... & Mackall, C. L. (2021). Transient rest restores functionality in exhausted CAR-T cells through epigenetic remodeling . Science, 372(6537), eaba1786.

Patents

- Published Application: WO2020092650

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