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Engineered Natural Killer Cells Redirected Toward Purinergic Signaling

Engineered natural killer cell therapy selectively targets and destroys CD73-expressing cancer cells, overcoming adenosine-mediated immune suppression in the solid tumor microenvironment.

Researchers at Purdue University have developed a cell therapy capable of exerting a cytotoxic effect on CD73 expressing cancer cells. Adenosine immunosuppression is a regulatory mechanism of the immune system that protects against autoimmunity. However, this mechanism also drives cancers that express the enzyme, CD73. This enzyme produces adenosine, a molecule that inhibits immune cells. The Purdue technology circumvents this adenosine-mediated immunosuppression to treat cancer.

Purdue's researchers engineered a type of immune cell, the natural killer (NK) cell, to target and kill cancer cells. The cells are engineered to express a protein consisting of an extracellular CD73 antibody fragment for targeting and an intracellular signaling domain that activates the NK cell to destroy the cancer cell. This potential therapy circumvents adenosine immunosuppression in the solid tumor microenvironment, selectively targeting cancer cells with engineered immune cells. The engineered NK cells have been successfully tested against glioblastoma cell lines and in vivo in lung carcinoma models, supporting this technology as a transformative cancer treatment to effectively target solid tumors.

Advantages

-Selective cancer therapeutic

-NK cell mediated cytotoxicity

Potential Applications

-Cancer therapeutic

-Circumvent adenosine immunosuppression

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Biotechnology & Life Sciences/Cell & Gene Therapy Platforms

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