Remotely-Activated Cell-based Immunotherapy

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Technology description

Researchers at UC San Diego developed a technology that offers controllable cellular therapeutic activation of engineered T-cells, using a method of remote stimulation. Localization of therapeutic efficacy, even deep within the body, may be provided by this technology, and with spatiotemporal precision and the limitation of off-target effects. The ability to activate desired T-cell functions, and to do so within a prescribed therapeutic area, is a significant new modality for therapeutics.
Upon delivery of the cells, and the targeted stimulus, a broad range of pre-programmed cellular activities and functions can be initiated. The method of cellular stimulation is based on widely-adopted medically-approved medical device technology that is non-invasive, and safe. The stimulus itself has minimal effect on the surrounding tissues, and so tunable therapy without invasive surgery is provided by the ability to directly apply the triggering signal to a localized area, and from a remote position.
Cellular therapies are becoming well established within the medical community. However, the degree of cellular activation can be an unknown factor, and the risk of off-target effects remains.
Cells may be delivered, but may not be therapeutically effective, or effective cells may elicit activity in an undesired location. The delivery of a cell therapy where a known quantity of cell activation occurs at a specific, selected site may therefore be advantageous. UC San Diego researchers have recently developed the methods and materials for remote control of cellular activation, to dynamically manipulate molecular events for immunotherapeutic effect.

Application area

This invention may be useful for the safe and noninvasive delivery of mechanical energy into small volumes of tissue deep inside the body to generate an intracellular response of signal or therapeutic outcome.

Advantages

Noninvasive technique capable of deep tissue penetration.

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