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CELL SPECIFIC IMMUNE CHECKPOINT THERAPY

THERAPEUTICS

Intrinsically immune-tolerant elastin-like recombinant polypeptides used in drug delivery for metabolic diseases and oncology with reduced toxicity.

TECHNOLOGY TYPE

Drug Delivery
Immuno-Oncology
Oncology
Nanoparticle
Peptide

STAGE OF DEVELOPMENT

Demonstrated efficacy with MHC class I tetramer guided αPD1 NP in NOD diabetic mice.

IP PROTECTION

Nationalized PCT Pending in the U.S., Canada, Europe, China, and Japan
WO2016196249A1

U.S. Utility Patent Pending
US20190106479A1

RECENT PUBLICATIONS

For a complete list of publications by Dr. Chen, please see the following publication list.

LEARN MORE

Reference Numbers: U-5890, U-6314

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TECHNOLOGY SUMMARY

Almost 80 percent of patients undergoing immunotherapy experience toxicity complications that reduce drug efficacy and over 10 percent of patients experience life-threatening infections.

New immune-tolerant elastin-like polypeptides (iTEPs) can be used as drug carriers without triggering an immune response in both mice and humans (Journal of Drug Targeting. Vol.24, p328-339). This technology has been applied to both drug delivery and immunology. The technology improves delivery of vaccines by conjugating the drug to the iTEP, which then self-assembles into highly stable, non-toxic nanoparticles with improved efficacy (Theranostics. Vol. 6(5), p666-678). The iTEPs are also utilized to target cytotoxic T lymphocytes and improve innate immune response as defense against cancer and infection. An iTEP-delivered CTL vaccine containing a metalloproteinase-9 (MMP-9)-sensitive peptide and a CTL epitope peptide has been developed. The MMP-9-sensitive vaccine increased epitope presentation by 7-fold, increasing the T-cell response by as high as 9.6-fold (Molecular Pharmaceutics, 14(10), 3312-3321). It has also been applied using αPD-1 antibody for checkpoint inhibition. A fusion protein consisting of a recombinant single-chain variable fragment of αPD-1 and an amphiphilic immune-tolerant elastin-like polypeptide self-assembles into a nanoparticle, which blocks the PD-1 immune checkpoint in vitro and in vivo (Molecular Pharmaceutics, 14(5), 1494-1500).

FEATURES AND BENEFITS

- Improves efficacy of peptide therapeutics.
- Eliminates toxicity problems associated with immune checkpoint therapy methods.
- Increases target specificity.
- Adapts to functionality of companion drug.

INVENTOR PROFILE

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