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
Immunoo-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
Immune Tolerant and Non-immune Tolerant Elastin-like Recombinant Peptides and Methods of Use
Provisional Patent Filed

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, U-6348

David Hadley
Technology Manager
david.hadley@tvc.utah.edu
801-587-0519

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
Mingnan Chen, Ph. D., Associate Professor - Pharmaceutical Chemistry
Hyung Jin Cho, Ph. D., Research Associate - CRTI
Shuyun Dong, Ph. D., Research Assistant Professor - Pharmaceutical Chemistry

DATE UPDATED: 12/1/2017