Synthetic Degradation Of Extracellular Soluble Proteins

Tech ID: 34741 / UC Case 2025-092-0

TECHNOLOGY DESCRIPTION

PRODUCT: Synthetic degradation platform. Modular, synthetic, lysosome-targeting receptor is introduced to target tissue or cells via mRNA or DNA. **Example**: a receptor can be delivered as mRNA carried by lipid nanoparticles (LNPs) to the liver to remove a protein of interest from circulation. In other applications, designer immune cells (T-cells) can be engineered ex vivo and logic-gated to degrade soluble proteins only in specific tissues or tumor microenvironment (TME).

INDICATIONS: Autoimmune/inflammatory diseases, oncology, endocrine disorders, and neurodegeneration. Example targets: TNF-α, IL-6, IL-12/23, VEGF, growth hormone, pathogenic autoantibodies

UNMET NEED: Extracellular soluble proteins drive many diseases but are difficult to selectively eliminate. Current antibody therapies lack tissue specificity. There are no effective approaches for targeted degradation of circulating autoantibodies.

COMPETITIVE ADVANTAGE / DIFFERENTIATION: **T**unable half-life for personalized medicine; can degrade auto-antibodies by displaying auto-antigens on the synthetic receptor; can remove only the circulating protein while sparing local paracrine and autocrine functions

DATA: Proof-of-concept demonstrated: engineered cells expressing synthetic receptor degrade model extracellular protein following transfection. Ongoing in vivo validation planned in disease models (e.g., rheumatoid arthritis, endocrine disorders)

STAGE / FUNDING: Early preclinical. Next steps: in vivo efficacy studies in mouse models, followed by large animal validation. NIH-funded

RELATED MATERIALS

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OTHER INFORMATION

CATEGORIZED AS

- Biotechnology
- Health

RELATED CASES

2025-092-0

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Degrader-Drug Conjugates

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