Novel Therapeutic Use of the Thyroid Hormone Receptor Beta (THR-ß) Agonist Resmetirom in Congestive Heart Failure

Tech ID: 34534 / UC Case 2026-361-0

ABSTRACT

Researchers at the University of California, Davis have demonstrated that THR-β agonists such as resmetirom, when repurposed, can effectively treat heart failure with preserved ejection fraction (HFpEF), addressing unmet clinical needs.

FULL DESCRIPTION

This technology encompasses compositions and methods for treating heart failure, specifically HFpEF, by administering thyroid hormone receptor beta (THR-β) agonists like resmetirom. HFpEF is characterized by impaired ventricular relaxation and elevated filling pressures despite normal ejection fraction, with limited therapeutic options. The approach utilizes selective THR-β activation to improve cardiac function, reduce inflammation, and fibrosis markers, either alone or combined with other heart failure medications such as GLP-1 agonists, SGLT-2 inhibitors, ARNis, or MRAs. Administration routes include oral and parenteral, with dosage tailored to patient needs. This innovative use addresses the complexity of HFpEF by modulating underlying pathological mechanisms.

APPLICATIONS

- Treatment of heart failure with preserved ejection fraction (HFpEF).
- Adjunctive therapy in congestive heart failure management.
- Combination therapies with GLP-1 agonists, SGLT-2 inhibitors, ARNis, or MRAs.
- Pharmaceutical development of novel THR-β agonist drugs or formulations.
- Personalized medicine targeting inflammatory and fibrotic pathways in cardiovascular diseases.
- Potential expansion into other cardiac and metabolic disorders responsive to THR-β modulation.

FEATURES/BENEFITS

- Targets HFpEF, a condition with limited treatment options.
- Selectively activates THR-β to reduce pro-inflammatory and fibrosis markers.
- Allows co-administration with established heart failure therapies for synergistic effects.
- Supports flexible dosing with oral and parenteral administration routes.
- Demonstrates reduction of key disease biomarkers such as NLRP3 and vimentin.
- Provides a tailored dosage range with a manageable safety profile.
- Enables development of polypharmacological formulations.
- Addresses the absence of effective therapies for HFpEF patients.

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OTHER INFORMATION

KEYWORDS

agonist, anti-inflammatory, antifibrotic, congestive heart failure, heart failure with preserved ejection fraction, resmetirom, thyroid hormone receptor beta, therapeutics, treatment, vascular stiffness

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Medical**
  - Disease: Cardiovascular and

- Mitigates ventricular stiffness and impaired relaxation central to HFpEF.
- Reduces systemic inflammation and myocardial fibrosis.
- Expands treatment options beyond metabolic liver diseases like MASLD or MASH.
- Improves exercise tolerance, relieves dyspnea, and lowers hospitalization rates.
- Offers a new mechanism of action distinct from conventional heart failure drugs.

Circulatory System

- Therapeutics

RELATED CASES

2026-361-0

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Soluble Epoxide Hydrolase-Conditioned Stem Cells for Cardiac Cell-Based Therapy

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