ALLELE-SELECTIVE ANTAGONISTS OF HLA-B27 FOR THE TREATMENT OF AUTOIMMUNE DISEASES

Tech ID: 34619 / UC Case 2026-111-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Autoimmune disorders such as ankylosing spondylitis are heavily linked to specific genetic human tissue types, particularly variations of the human leukocyte antigen B27. Traditional treatments for these debilitating conditions often rely on broad immunosuppression, which weakens a patient's entire immune defense and increases the risk of infections. To provide a more precise solution, UC Berkeley researchers have developed small-molecule ligands that selectively target and block a specific disease-associated variation of this allele, known as human leukocyte antigen B27:05. The therapeutic compounds feature a distinct three-part molecular architecture that includes a targeted binding group designed to fit securely into a specific molecular pocket, a flexible chemical linker, and a reactive group that forms a stable bond with a neighboring cysteine amino acid residue. By turning off only the specific genetic driver responsible for the autoimmune reaction, this technology opens the door to highly targeted therapies that treat the root cause of the disease while leaving the rest of the immune system fully functional.

SUGGESTED USES

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Targeted Autoimmune Therapies: Developing precision medicines to treat ankylosing spondylitis and other closely related spondyloarthropathies.

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MHC-Associated Disease Management: Addressing other conditions strongly linked to the human leukocyte antigen B27 tissue type, such as acute anterior uveitis, reactive arthritis, and psoriatic arthritis.

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Precision Medicine Platforms: Creating diagnostic-therapeutic pairs where patients are screened for specific major histocompatibility complex class I profiles and treated with matching allele-specific blockers.

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Drug Discovery Research: Utilizing the specialized chemical architecture as a molecular scaffold to design inhibitors for other problematic major histocompatibility complex alleles.

ADVANTAGES

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Exceptional Selectivity: Pinpoints the specific disease-driving variant while sparing other closely related human leukocyte antigens, significantly reducing the risk of side effects.

CONTACT

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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**

» Health

» **Medical**

» Therapeutics

RELATED CASES

2026-111-0

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Durable Inhibition: The inclusion of a cysteine-reactive group allows the molecule to form a secure covalent bond with the target, providing long-lasting therapeutic effects.

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Modular Chemical Framework: The three-part structural design offers chemists great flexibility to modify the linker or binding groups to optimize the drug's stability, potency, and safety profile.

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Preserved Immune Function: By avoiding broad-spectrum immune suppression, patients maintain their natural ability to fight off everyday infections and pathogens.

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Flexible Formulation Options: The technology encompasses various stable forms of the compounds, including pharmaceutically acceptable salts, hydrates, stereoisomers, and dimers, simplifying mass manufacturing and drug delivery.

RELATED MATERIALS

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Small Molecule Activators Of GTP Hydrolysis For Mutant Ras-Driven Cancer

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