Advanced Combination Therapy for HIV using Bioactive Lipids with ART

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ABSTRACT

Researchers at the University of California, Davis have developed a therapy that combines bioactive lipids with antiretroviral drugs to accelerate viral suppression and promote gut mucosal repair in HIV treatment.

FULL DESCRIPTION

This invention enhances traditional antiretroviral therapy (ART) by integrating bioactive lipids such as 10-hydroxystearic acid (10-HSA), Oleoylethanolamide (OEA), and UCD3R, aimed at promoting mucosal healing, restoring energy metabolism, and rebalancing gut microbiota in HIV-infected individuals. Demonstrated in non-human primate models, this combination therapy not only accelerates viral load reduction but also repairs gut epithelial barriers and improves immune function more effectively than ART alone. The treatment also shows positive modulation of lipid metabolism pathways and microbial diversity, supporting faster host recovery from viral damage.

APPLICATIONS

- Adjunctive HIV/AIDS therapies to improve ART outcomes.
- Pharmaceutical development of combination therapies targeting mucosal repair.
- Immunometabolic therapeutics focused on viral infections and gut health.
- Intervention strategies for managing chronic immune activation in HIV.
- Microbiome-supportive treatments aimed at restoring gut microbial balance.
- Potential treatment for hepatic and other inflammation-related disorders linked to lipid metabolism.

FEATURES/BENEFITS

- Accelerates plasma viral load suppression beyond what ART alone achieves.
- Promotes rapid repair of gut mucosal epithelial barriers.
- Enhances recovery of mucosal CD4+ T cells and reduces chronic immune activation.
- Supports lipid metabolism and maintains energy homeostasis via PPARα activation.
- Improves gut microbiome diversity by enriching beneficial bacterial taxa.
- Suppresses HIV latency reactivation through NF-κB inhibition.
- Reduces pro-inflammatory antiviral signaling and minimizes DNA damage.
- Enables heightened therapeutic effects when combined with synthetic lipid formulations (UCD3R).
- Prevents persistent viral replication that can occur despite ART treatment.
- Repairs gut mucosal damage and reduces barrier permeability in HIV-infected patients.
- Corrects altered energy metabolism and mitigates mitochondrial dysfunction associated with HIV.
- Diminishes chronic immune activation and inflammation persisting during ART.
- Restores gut microbiome diversity disrupted by HIV infection.
- Inhibits reactivation of latent HIV reservoirs that hinder complete viral suppression.
- Promotes mucosal immune recovery insufficient under standard ART regimens.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Cucumber Mosaic Virus Inducible Viral Amplicon (CMViva) Expression System
- Generation of Novel Biotherapeutic (UCD3R) to Repair, Restore and Regenerate Epithelial and Neuronal Systems
- Methods for Disrupting HIV Latency Using Anti-HIV Latency Agents
- Plants as Platform for the Biosynthesis of Melanin
- Molecule for Repairing Leaky Gut And Restoring Energy Metabolism

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OTHER INFORMATION

KEYWORDS

10-hydroxystearic acid, antiretroviral therapy, gut mucosal repair, HIV, immune activation, microbiome diversity, oleoylethanolamide, PPARa, viral suppression, viral latency

CATEGORIZED AS

- **Medical**
  - Disease: Infectious Diseases
  - Therapeutics

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