

TALENs-Based Biotechnological Invention for HIV-1 Inactivation

ID: 2015-078

Executive Statement:

A groundbreaking biotechnological invention utilizing TALENs to specifically target and inactivate HIV-1 by editing its DNA sequence.

Technology Overview:

This technology involves the development and application of Transcription Activator-Like Effector Nucleases (TALENs) to cut specific DNA sequences, particularly targeting the HIV-1 long terminal repeat (LTR) regions. The main objective is to produce HIV-1-resistant cells, utilizing a humanized mouse model as a preliminary test platform. This approach aims to maintain immune system integrity and halt the progression of AIDS in humans.

Key Advantages:

- Specific targeting of HIV-1 DNA sequences, minimizing off-target effects
- Potential to produce HIV-1-resistant cells, offering a long-term therapeutic solution
- Utilizes a humanized mouse model for preliminary testing, facilitating the transition to human applications
- Focuses on targeting stem cell populations, offering a more sustainable solution compared to treatments focusing on mature T cells

Problems Addressed:

- Inactivation of HIV-1 to prevent the progression of AIDS
- Overcomes limitations of temporary treatments by targeting the genetic source of HIV-1
- Provides a potential long-term solution to HIV-1 by altering the host's DNA to resist the virus

Market Applications:

- Therapeutic interventions for HIV-1 and AIDS
- Development of HIV-resistant cell therapies
- Potential for broader applications in gene editing for other viral infections