



Multicolor Reporter Cells for Detecting and Quantifying HIV-1

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method using multicolor fluorescent reporter cells in a simple and cost-effective HIV-1 quantitative viral outgrowth assay.

The assay reliably monitors latent virus reservoir size in HIV-1-infected human subjects and non-human primate models of HIV/AIDS. This method enables direct, real-time monitoring of the biogenesis and transmission of HIV-1 at single cell resolution and over multiple rounds of viral replication.

Overview

It is estimated that half of new HIV infections in the U.S. are from patients who know they are HIV-positive but underestimate their transmissibility. Identifying and monitoring the latent HIV reservoir in these individuals could inform patient care and significantly reduce the incidence of new infections.

Currently, tests for measuring the latent HIV reservoir are difficult to perform, time consuming and expensive. These include the quantitative viral outgrowth assay (Q-VOA). A simple and low-cost alternative could be a gamechanger in global health.

The Invention

UW–Madison researchers have developed highly sensitive and specific reporter cell lines suitable for automated detection of HIV in a microfluidic platform. The multicolor fluorescence-based cell readouts respond robustly to HIV-1 infections, and are useful for tracking the spread of HIV-1 infection and ideal for implementation in an automated Q-VOA assay.

The reporter cells are based on coupling fluorescent markers turned ‘on’ in response to HIV infection to markers turned ‘off’ by the virus. Calculating net ‘on/off’ ratios over time, relative to standards, allows for high sensitivity and favorable signal-to-noise. The ability to amplify response signals with minimal background and without the need for chemical substrates represents a significant improvement over existing green fluorescent protein (GFP) or chemiluminescence-based single reporter lines.

Applications

- Detecting and quantifying viral reservoir
- Patient care
- Research tool

Key Benefits

- High sensitivity
- No chemical substrates
- Fast, low cost and accurate

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Stage of Development

HeLa cell and Jurkat cell constructs have been tested and other constructs are in development, including a version of the assay in a microfluidic device.

Additional Information

For More Information About the Inventors

- [Nathan Sherer](#)

Tech Fields

- [Diagnostics & Biomarkers : Diagnostics](#)
- [Research Tools : Cell lines](#)
- [Research Tools : Detection](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854

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