

Single-step reporter-cell assay for antigen-specific T cell responses

A rapid, single-step assay that measures cellular (T cell) immunity directly from as little as 50 μ L of whole blood — collapsing the multi-step, large-volume flow-cytometry/ELISPOT workflow into one incubation, read on a standard luminometer.

// TECHNOLOGY OVERVIEW

Cellular immunity is a critical indicator of long-term protection, persisting even as antibody levels wane. Yet T cell response is rarely included in routine immune monitoring: flow cytometry and ELISPOT have long turnaround times, require multiple processing steps, and consume large sample volumes (3–5 mL of blood, 100,000–300,000 cells) — ruling out finger-prick collection and decentralised testing.

This technology provides **a method, an engineered reporter cell line**, and a **ready-to-use kit** for detecting antigen-specific T cell responses in whole blood or PBMC samples, meeting the demand for minimal sample volume, few processing steps, and read-out on standard instruments.

// OUR INNOVATION

- ✓ **Single-step co-incubation**
Sample, antigen and reporter cell line together in one step, simplifying the conventional two-stage stimulate-then-transfer process.
- ✓ **Optional co-stimulation boost**
cuts incubation from roughly 19 to roughly 12 hours while preserving signal, via co-incubation with monoclonal antibodies to co-stimulatory molecules.
- ✓ **In-house engineered reporter line**
Generates a clean, quantifiable signal on a luminometer or flow cytometer in response to antigen-specific T cells secreting IFN- γ .

// OUR VALUE PROPOSITION

Finger-prick compatible

Detects a response from as little as 50 μ L of blood, versus 3–5 mL for conventional assays, enabling decentralised and paediatric testing

More sensitive than the standards

In head-to-head testing, more stimulated samples cleared the detection threshold than with flow cytometry or ELISPOT.

Faster and simpler

One incubation reduces hands-on time to about 2 hours or less, with total turnaround of roughly 12.5–24.5 hours.

Easy to adopt

Delivered as a complete kit and read on standard luminometers, requiring minimal new infrastructure or training.

POTENTIAL APPLICATIONS:

VACCINE IMMUNOGENICITY & EFFICACY MONITORING

POINT-OF-CARE & DECENTRALISED IMMUNE TESTING

INFECTIOUS DISEASE IMMUNE SURVEILLANCE

CELLULAR IMMUNITY RESEARCH TOOLS

// TECHNOLOGY DEVELOPMENT STATUS

TRL

3

Early-stage validation

BASIC RESEARCH

DEPLOYMENT

- Method, engineered reporter cell line and vector, and kit format established
- Performance validated head-to-head against flow cytometry and ELISPOT on finger-prick-volume blood samples

PATENT

PCT/SG2025/050730 (2025) — PCT application filed (WO2026106555A1); priority SG 10202403596X (18 Nov 2024).

CATEGORIES

Healthcare · Diagnostics · Immune Monitoring
· Vaccine Development · Point-of-Care · Infectious Diseases

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