

**H**CMV infects the majority of the human population with the virus persisting, typically asymptotically, in various tissues. In states of immunodeficiency, however, the infection can reactivate, leading to clinical complications. The immune system responds to reactivation of the CMV virus, which can be detected by ELISPOT-based immune monitoring. For transplantation purposes, it is also essential to identify donors who have not been infected with HCMV in order to avoid infecting transplant recipients.

### Three independent means of unambiguous detection of CMV exposure — detecting CMV-specific memory B cells, CD4+ T cells, and CD8+ T cells!

CMV can be detected in serum only during massive viraemia. CMV-specific serum antibodies do not provide information on the reactivation of the virus. Therefore, more and more effort is invested in monitoring CMV-specific memory lymphocytes. Traditionally, only CMV-specific CD8+ cells have been detected. We offer kits that permit the monitoring of CMV-specific CD4+ cells and B cells, in addition to CD8+ cells.

### Assay Principle

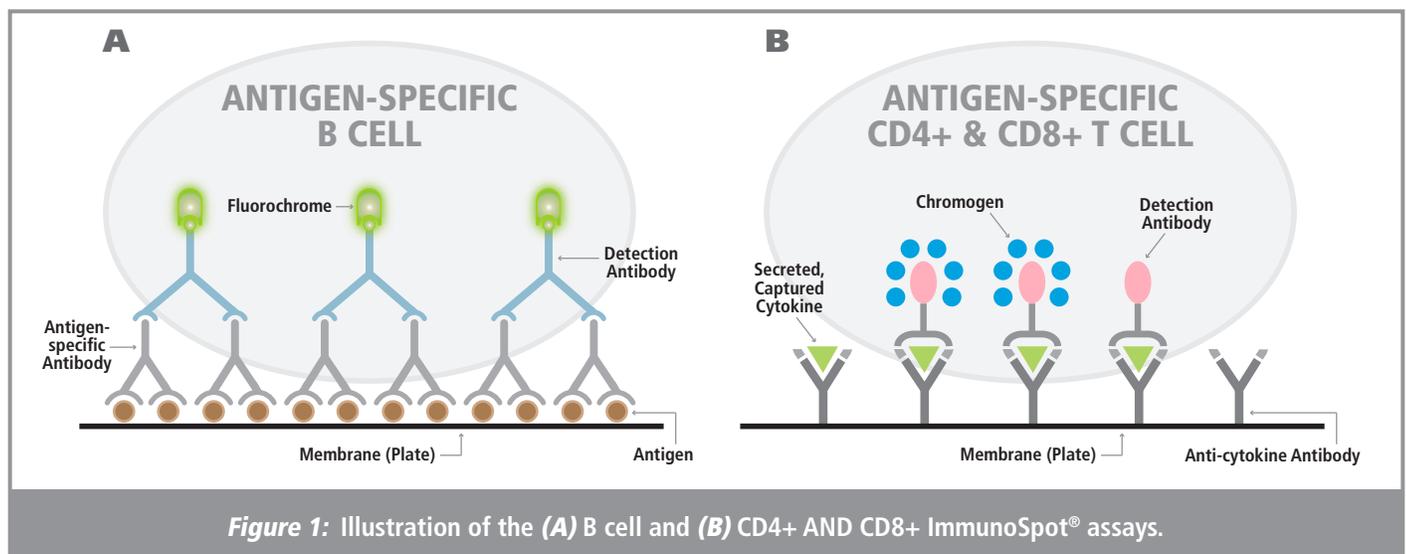
Memory B cells are detected in the ELISPOT assay format. When CMV specific B cells secrete anti-CMV antibodies, they are captured and visualized on a CMV-coated membrane. Each CMV-specific B cell is indicated by a spot forming unit in the ELISPOT assay, which is then scanned, imaged, and analyzed using the CTL ImmunoSpot® Analyzer. The spot morphology reveals the affinity of the antibody produced by the B cell. Spontaneous antibody production indicates reactivation of the virus.

The detection of memory CD4+ cells relies on exposing them to inactivated CMV virions that require antigen pro-

cessing and presentation on HLA Class II molecules. CMV-specific CD8+ cells are detected using a peptide library that contains determinants capable of binding to all human HLA Class I molecules. The numbers/frequency of CMV-specific CD4+ or CD8+ cells are detected in an IFN- $\gamma$  ELISPOT assay, where each spot indicates an activated CD4+ or CD8+ cell, depending on the antigen used.

### Superior sensitivity and specificity relative to sero-diagnostic or RT-PCR.

Figure 2 shows test results for an individual who was CMV-infected (Donor 1), and one who was not (Donor 2). As expected, PBMC of Donor 1 were



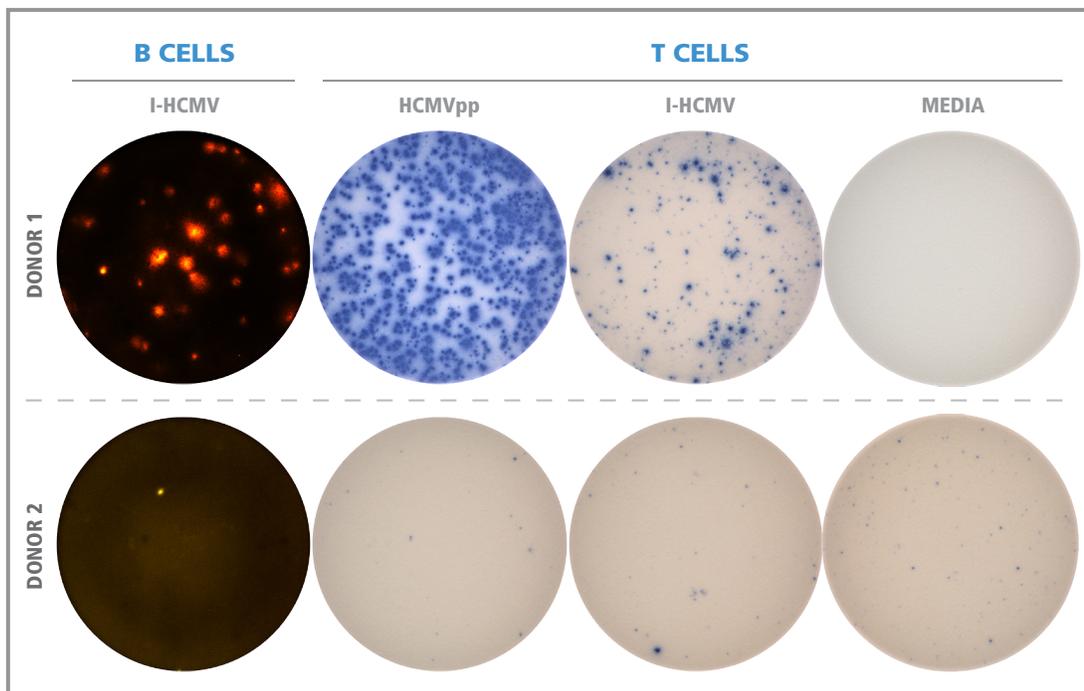
# IMMUNOSPOT® CMV Test Kits

found to contain CMV-specific memory B cells, as well as CD4+ and CD8+ memory cells. This donor therefore, exhibited three independent lines of evidence for having been infected with CMV and having developed immunity to CMV. Strikingly, Donor 1 was sero-negative for CMV! We tested an additional 67 donors who were sero-negative for CMV, as well as RT-PCR negative. Of these 67 donors, 37 showed HCMV-specific memory lymphocytes in all three lineages: B cells, CD4 cells, and CD8 cells. Detection of HCMV-specific memory cells therefore, appears to be a far more sensitive and reliable means for

identifying CMV exposure of a subject than measuring serum antibodies, or RT-PCR.

## ImmunoSpot® CMV Test Kits Portfolio

Permitting the detection of CMV-specific memory B cells, as well as memory CD4+ and CD8+ cells, ImmunoSpot® CMV Test Kits offer a COMPLETE solution for monitoring immunity of CMV in humans. The kits contain antigens, capture and detection antibodies, detection reagents, diluent buffers, serum-free assay medium, and PVDF-membrane plates.



**Figure 2:** HCMV exposure is detected by recalling memory B cells, CD8+ T cells, and CD4+ T cells in ImmunoSpot® assays. Donor 1 exhibits three independent lines of evidence for being infected with CMV, whereas Donor 2 is unambiguously negative.

## ImmunoSpot® CMV Test Kits available:

- CMV-IFN- $\gamma$
- CMV-GzB
- CMV-IL-2
- CMV-IL-4
- CMV-IL-5
- CMV-IL-10
- CMV-BE

**Contact us today for more information.**

**Unambiguous detection of CMV exposure and monitoring of anti-CMV immunity is now easier than ever before. Join the community of researchers using ImmuoSpot® CMV Test Kits today!**

# CTL.

**Cellular Technology Limited**

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