For Research Use Only.
Not for use in diagnostic procedures.

T-Select MHC Tetramer

HLA-A*02:01 HIV gag Tetramer -SLYNTVATL (50 tests)

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Background

T lymphocytes play a central role in immune system. Total T cell and T cell subset counts are measured by detection of various cell surface molecules. Enumeration of $CD8^+$ antigen-specific T cells requires cognate recognition of the T cell receptor (TCR) by a class I MHC/peptide complex. This can be done using T-Select MHC class I Tetramers which are composed of four MHC class I molecules each bound to the specific peptide and conjugated with a fluorescent protein. Thus, T-Select MHC Tetramer assays allow quantitation of the total T cell population specific for a given peptide complexed with a particular MHC molecule. Furthermore, since binding does not depend on functional pathways, this population includes specific $CD8^+$ T cells regardless of functional status. Measurements may be performed in whole blood or isolated lymphocyte/mononuclear cell preparations. In some cases where frequency is low, it may be necessary to perform an *in vitro* cell expansion. Specific cell staining is accomplished by incubating the sample with the T-Select MHC Tetramer reagent, then washing away excess Tetramer. The number of Tetramer positive lymphocytes is then determined by flow cytometry.

This Tetramer reagent comprises human class I HLA-A*02:01 and epitope peptide derived from human immunodeficiency virus type 1 (HIV-1) p17 Gag protein, and it can detect HLA-A*02:01-restricted HIV Gag protein-specific $CD8^+$ T cells by flow cytometry.

HIV is an enveloped RNA virus and the cause of AIDS (acquired immunodeficiency syndrome). There are two major types of HIV. HIV-1 is the most common type found worldwide, and HIV-2 is found mostly in West Africa. HIV infection is associated with the progressive loss of $CD4^+$ T cells which results in a failure of immune control of the replication of viruses, such as EBV, CMV, and Kaposi's sarcoma-associated herpesvirus (KSHV). Highly active antiretroviral therapy (HAART) suppresses HIV-1 replication and dramatically improves the prognosis of HIV-infected individuals but cannot eradicate the virus. The contribution of cytotoxic T lymphocytes (CTLs) in controlling HIV replication and delaying disease progression has been well demonstrated. Therefore, vaccination to elicit HIV-1-specific immune responses is a potentially useful adjunctive therapy to HAART.

HLA Restriction

HLA-A*02:01

Origin and Sequence of CTL Epitope

HIV-1 Gag p17 (SL9, 77-85 aa, SLYNTVATL)

Reagents

500 μL liquid - 10 μL/test
The Tetramer is dissolved in an aqueous buffer containing 0.5 mM EDTA, 0.2% BSA, 10 mM Tris-HCl (pH 8.0), 150 mM NaCl, and 0.09% NaN_3.

Conjugates

TS-M027-1
Streptavidin-Phycoerythrin (SA-PE)
Excites at 486-580 nm
Emits at 586-590 nm

TS-M027-2
Streptavidin-Allophycocyanin (SA-APC)
Excites at 633-635 nm
Emits at 660-680 nm

TS-M027-3
Streptavidin-Fluorescein Isothiocyanate (SA-FITC)
Excites at 465-495 nm
Emits at 515-555 nm

Storage Conditions

Store at 2 to 8°C. Do not freeze. Minimize exposure to light. The expiration date is indicated on the vial label.

Evidence of Deterioration

Any change in the physical appearance of this reagent may indicate deterioration and the reagent should not be used. The normal appearance is a clear, colorless to pink (SA-PE), light blue (SA-APC), or light yellow liquid (SA-FITC).

Usage

This reagent is for use with standard flow cytometry methodologies.

MEDICAL & BIOLOGICAL LABORATORIES CO., LTD.
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References for These Products

1) Tsomides TJ, *et al*. *J Exp Med* **180**: 1283-1293 (1994)
2) Goulder PJR, *et al*. *J Exp Med* **185**: 1423-1433 (1997)
3) Ogg GS, *et al*. *Science* **279**: 2103-2106 (1998)
4) Brander C, *et al*. *J Clin Invest* **101**: 2559-2566 (1998)
5) Gray CM, *et al*. *J Immunol* **162**: 1780-1788 (1999)
6) Goulder PJR, *et al*. *J Exp Med* **193**: 181-193 (2001)
7) Ferrari G, *et al*. *J Immunol* **173**: 2126–2133 (2004)
8) Kan-Mitchell J, *et al*. *J Immunol* **176**: 6690–6701 (2006)
9) Gulley JL, *et al*. *Clin Cancer Res* **14**: 3060-3069 (2008)
10) Harari A, *et al*. *J Virol* **83**: 2862-2871 (2009)
11) Cellerai C, *et al*. *J Virol* **84**: 3868-3878 (2010)
12) Killian MS, *et al*. *J Virol* **85**: 1696-1705 (2011)
13) Najima Y, *et al*. *Blood* **127**: 722-734 (2016)

High Specificity

The T cell surface CD8 enhances T cell antigen recognition by binding to HLA class I molecules. Therefore, MBL produced T-Select MHC class I human Tetramers with one point mutation at the HLA α3 domain known to alter the interaction with CD8. These mutated Tetramers showed a greatly diminished nonspecific binding but retained specific binding. Alterations of CD8 binding by mutation of the MHC greatly improved the specificity of MHC-peptide multimers, thus providing efficient tools to sort specific human T cells for immunotherapy.
(French application Number; FR9911133)

References for T-Select MHC Tetramer

Altman JD, *et al. Science* **274**: 94-96 (1996)
McMichael AJ, *et al. J Exp Med* **187**: 1367-1371 (1998)
Bodinier M, *et al. Nat Med* **6**: 707-710 (2000)

Statement of Warnings

1. This reagent contains 0.09% sodium azide. Sodium azide under acid conditions yields hydrazoic acid, an extremely toxic compound. Azide compounds should be flushed with running water while being discarded. These precautions are recommended to avoid deposits in metal piping in which explosive conditions can develop. If skin or eye contact occurs, wash excessively with water.
2. Specimens, samples and material coming in contact with them should be handled as if capable of transmitting infection and disposed of with proper precautions.
3. Never pipette by mouth and avoid contact of samples with skin and mucous membranes.
4. Minimize exposure of reagent to light during storage or incubation.
5. Avoid microbial contamination of reagent or erroneous results may occur.
6. Use Good Laboratory Practices (GLP) when handling this reagent.

Materials Required But Not Supplied

- 12 x 75 mm polypropylene test tubes
- Transfer pipettes
- Pipettors and disposable pipette tips
- Vortex mixer
- Centrifuge capable of 150 x g or 400 x g
- Aspirator
- PBS
- Red blood cell lysis reagent
- Anti-CD8-FITC, Beckman Coulter, Inc., PN 6603861
- Anti-CD8-PC5, Beckman Coulter, Inc., PN 6607011
- 7-AAD Viability Dye, Beckman Coulter, Inc., PN A07704
- Clear Back (human FcR blocking reagent), MBL, PN MTG-001

Procedure for Whole Blood

1. Collect blood by venipuncture into a blood collection tube containing an appropriate anti-coagulant.
2. Add 10 μL of T-Select MHC Tetramer to each 12 x 75 mm test tube.
3. Add 200 μL of whole blood into each test tube.
4. Vortex gently.
5. Incubate for 30-60 minutes at 2-8°C or room temperature (15-25°C) protected from light.
6. Add any additional antibodies (e.g. anti-CD8) and vortex gently.
7. Incubate for 30 minutes at 2-8°C protected from light.
8. Lyse red blood cells using commercially available reagents.
9. Prepare samples according to description of the package insert.
10. Analyze prepared samples by flow cytometry. If necessary, store the samples at 2-8°C protected from light for a maximum of 24 hours prior to analysis.

Procedure for Peripheral Blood Mononuclear Cells

1. Prepare peripheral blood mononuclear cells (PBMC) according to established procedures. Cells should be re-suspended at a concentration of 2 x 10^7 cells/mL. 50 μL of sample is required for each T-Select MHC Tetramer determination.
2. Add 10 μL of Clear Back (human FcR blocking reagent, MBL, PN MTG-001) to each 12 x 75 mm test tube.
3. Add 50 μL PBMC into each test tube (e.g. 1 x 10^6 cells per tube).
4. Incubate for 5 minutes at room temperature.
5. Add 10 μL of T-Select MHC Tetramer and vortex gently.
6. Incubate for 30-60 minutes at 2-8°C or room temperature (15-25°C) protected from light.
7. Add any additional antibodies (e.g. anti-CD8) and vortex gently.
8. Incubate for 30 minutes at 2-8°C protected from light.

9. Add 3 mL of PBS or FCM buffer (2% FCS/0.09% NaN_3/PBS).
10. Centrifuge tubes at 400 x g for 5 minutes.
11. Aspirate or decant the supernatant.
12. Resuspend the pellet in 500 μL of PBS with 0.5% formaldehyde.
13. Analyze prepared samples by flow cytometry. If necessary, store the samples at 2-8°C protected from light for a maximum of 24 hours prior to analysis.

Limitations

1. For optimal results with whole blood, retain specimens in blood collection tubes at room temperature, while rocking, prior to staining and analyzing. Refrigerated specimens may give aberrant results.
2. Recommended cell viability for venous blood specimens is > 90%.
3. Prolonged exposure of cells to lytic reagents may cause white blood cell destruction and loss of cells in the population of interest.
4. All red blood cells may not lyse under the following conditions: nucleated red blood cells, abnormal protein concentration or hemoglobinopathies. This may cause falsely decreased results due to unlysed red blood cells being counted as leukocytes.

Technical Hints

A. If PBMC culture is needed, we recommend the use of heparin as an anti-coagulant.
B. Clear Back reagent (human FcR blocking reagent) may effectively block non-specific binding caused by macrophages or endocytosis, resulting in clear staining when cells are stained with MHC Tetramer and antibodies. Please refer to the data sheet (MBL, PN MTG-001) for details.
C. A Tetramer that is constructed with the same allele of interest and an irrelevant peptide may be used as a negative control.
D. We recommend the use of CD8 antibody, clone SFCI21Thy2D3 (T8, Beckman Coulter, Inc.), which does not block or interfere with the specific binding of MHC Tetramers to T cells.
E. The use of CD45 antibody and gating of the lymphocyte population are recommended in order to reduce contamination of unlysed or nucleated red blood cells in the gate.
F. Apoptotic, necrotic, and/or damaged cells are sources of interference in the analysis of viable cells by flow cytometry. Cell viability should be determined by 7-aminoactinomycin D (7-AAD) staining; intact viable cells remain unstained (negative).
G. Cells do not require fixation prior to analysis if the stained cells are analyzed by flow cytometry within several hours.

Related Products

Human Tetramers

Cancer

TS-M141-1	HLA-A*24:02 ACC-1 Tetramer-DYLQYVLQI-PE
TS-M137-1	HLA-A*01:01 AIM-2 Tetramer-RSDSGQQARY-PE
TS-M112-1	HLA-A*24:02 $CA9_{219-227}$ Tetramer-EYRALQLHL-PE
TS-M103-1	HLA-A*02:01 CEA Tetramer-YLSGANLNL-PE
TS-M080-1	HLA-A*02:01 CEA (N6D) Tetramer-YLSGADLNL-PE
TS-M101-1	HLA-A*02:01 CD33 Tetramer-AIISGDSPV-PE
TS-M102-1	HLA-A*02:01 CD33 A65Y Tetramer-YIISGDSPV-PE
TS-M084-1	HLA-A*02:01 EphA2 Tetramer-TLADFDPRV-PE
TS-0014-1C	HLA-A*02:01 gp100 (wild) Tetramer-ITDQVPFSV-PE
TS-0013-1C	HLA-A*02:01 gp100 (mutant) Tetramer-IMDQVPFSV-PE
TS-0035-1C	HLA-A*02:01 $gp100_{154-162}$ Tetramer-KTWGQYWQV-PE
TS-M082-1	HLA-A*02:01 gp100 Tetramer-YLEPGPVTA-PE
TS-M089-1	HLA-A*24:02 gp100-intron 4 Tetramer-VYFFLPDHL-PE
TS-0016-1	HLA-A*02:01 Her-2/neu Tetramer-RLLQETELV-PE
TS-0015-1C	HLA-A*02:01 Her-2/neu E75 Tetramer-KIFGSLAFL-PE
TS-M083-1	HLA-A*02:01 HM1.24 Tetramer-KLQDASAEV-PE
TS-M010-1	HLA-A*24:02 hTERT Tetramer-VYGFVRACL-PE
TS-M115-1	HLA-A*02:01 hTERT Tetramer-ILAKFLHWL-PE
TS-M086-1	HLA-A*02:01 IDO Tetramer-ALLEIASCL-PE
TS-M114-1	HLA-A*01:01 MAGE-A1 Tetramer-EADPTGHSY-PE
TS-M070-1	HLA-A*02:01 MAGE-A1 Tetramer-KVLEYVIKV-PE
TS-M071-1	HLA-B*07:02 MAGE-A1 Tetramer-RVRFFFPSL-PE
TS-M072-1	HLA-A*02:01 MAGE-A2 Tetramer-YLQLVFGIEV-PE
TS-M073-1	HLA-A*24:02 MAGE-A2 Tetramer-EYLQLVFGI-PE
TS-M074-1	HLA-A*01:01 MAGE-A3 Tetramer-EVDPIGHLY-PE
TS-M075-1	HLA-A*02:01 $MAGE-A3_{112-120}$ Tetramer-KVAELVHFL-PE
TS-M076-1	HLA-A*02:01 $MAGE-A3_{271-279}$ Tetramer-FLWGPRALV-PE
TS-M077-1	HLA-A*24:02 MAGE-A3 Tetramer-IMPKAGLLI-PE
TS-M078-1	HLA-A*02:01 MAGE-A10 Tetramer-GLYDGMEHL-PE
TS-M138-1	HLA-A*02:01 MAGE-C1 Tetramer-ILFGISLREV-PE
TS-0009-1C	HLA-A*02:01 Mart-1 Tetramer-ELAGIGILTV-PE
TS-M091-1	HLA-A*24:02 MCPyV large T Ag Tetramer-EWWRSGGFSF-PE
TB-M088-1	HLA-A*02:01 MUC1 Tetramer-LLLLTVLTV-PE
TS-M011-1	HLA-A*02:01 NY-ESO-1 Tetramer-SLLMWITQC-PE
TS-M105-1	HLA-A*02:01 NY-ESO-1 C9V Tetramer-SLLMWITQV-PE
TS-M109-1	HLA-B*07:02 P2X5 Tetramer-TPNQRQNVC-PE
TS-M081-1	HLA-A*02:01 p53 Tetramer-LLGRNSFEV-PE
TS-M107-1	HLA-A*02:01 $PAP_{299-307}$ Tetramer-ALDVYNGLL-PE
TS-M136-1	HLA-A*24:02 PBF A24.2 Tetramer-AYRPVSRNI-PE
TS-M117-1	HLA-A*02:01 $PRAME_{100-108}$ Tetramer-VLDGLDVLL-PE
TS-M119-1	HLA-A*02:01 $PRAME_{142-151}$ Tetramer-SLYSFPEPEA-PE
TS-M116-1	HLA-A*02:01 $PRAME_{300-309}$ Tetramer-ALYVDSLFFL-PE
TS-M118-1	HLA-A*02:01 $PRAME_{425-433}$ Tetramer-SLLQHLIGL-PE
TS-M120-1	HLA-A*02:01 $PSA_{141-150}$ Tetramer-FLTPKKLQCV-PE
TS-0017-1	HLA-A*02:01 PR-1 Tetramer-VLQELNVTV-PE
TS-M087-1	HLA-A*02:01 PSA Tetramer-KLQCVDLHV-PE
TS-M104-1	HLA-A*02:01 RHAMM Tetramer-ILSLELMKL-PE
TS-M095-1	HLA-A*02:01 PP2A Tetramer-SLLPAIVEL-PE
TS-M079-1	HLA-A*02:01 SSX-2 Tetramer-KASEKIFYV-PE
TS-M025-1	HLA-A*24:02 survivin-2B Tetramer-AYACNTSTL-PE
TS-M085-1	HLA-A*02:01 Survivin (T2M) Tetramer-LMLGEFLKL-PE
TS-0019-1C	HLA-A*02:01 Tyrosinase Tetramer-YMDGTMSQV-PE
TS-M090-1	HLA-A*24:02 Tyrosinase Tetramer-AFLPWHRLF-PE
TS-M016-1	HLA-A*02:01 $WT1_{126-134}$ Tetramer-RMFPNAPYL-PE
TS-M140-1	HLA-A*02:01 $WT1_{37-45}$ Tetramer-VLDFAPPGA-PE
TS-M014-1	HLA-A*24:02 modified WT1 Tetramer-CYTWNQMNL-PE

Adenovirus

TS-M058-1 HLA-A*02:01 Adv11 Hexon$_{913-921}$ Tetramer-YLLFEVFDV-PE
TS-M059-1 HLA-A*02:01 Adv11 Hexon$_{914-922}$ Tetramer-LLFEVFDVV-PE
TS-M061-1 HLA-A*02:01 AdV Hexon$_{917-925}$ Tetramer-YVLFEVFDV-PE

CMV

TS-M057-1 HLA-A*02:01 CMV IE1$_{316-324}$ Tetramer-VLEETSVML-PE
TS-0010-1C HLA-A*02:01 CMV pp65 Tetramer-NLVPMVATV-PE

EBV

TS-0011-1C HLA-A*02:01 EBV BMLF1 Tetramer-GLCTLVAML-PE
TS-M006-1 HLA-A*02:01 EBV LMP1 Tetramer-YLQQNWWTL-PE
TS-M030-1 HLA-A*02:01 EBV LMP2$_{243-251}$ Tetramer-TVCGGIMFL-PE
TS-M031-1 HLA-A*02:01 EBV LMP2$_{329-337}$ Tetramer-LLWTLVVLL-PE
TS-M069-1 HLA-A*02:01 EBV LMP2$_{356-364}$ Tetramer-FLYALALLL-PE
TS-M032-1 HLA-A*02:01 EBV LMP2$_{426-434}$ Tetramer-CLGGLLTMV-PE

HBV

TS-0018-1C HLA-A*02:01 HBV core Tetramer-FLPSDFFPSV-PE
TS-M051-1 HLA-A*02:01 HBV env335-343 Tetramer-WLSLLVPFV-PE
TS-M052-1 HLA-A*02:01 HBV env$_{348-357}$ Tetramer-GLSPTVWLSV-PE
TS-M053-1 HLA-A*02:01 HBV pol Tetramer-FLLSLGIHL-PE

HCV

TS-M039-1 HLA-A*02:01 HCV NS3$_{1073-1081}$ Tetramer-CINGVCWTV-PE
TS-M040-1 HLA-A*02:01 HCV NS3$_{1406-1415}$ Tetramer-KLVALGINAV-PE
TS-M041-1 HLA-A*02:01 HCV NS4B$_{1992-2000}$ Tetramer-VLSDFKTWL-PE
TS-M042-1 HLA-A*02:01 HCV NS5B$_{2594-2602}$ Tetramer-ALYDVVTKL-PE
TS-M043-1 HLA-A*02:01 HCV NS5B$_{2594-2602}$ Tetramer-ALYDVVSKL-PE

HIV

TS-M027-1 HLA-A*02:01 HIV gag$_{77-85}$ Tetramer-SLYNTVATL-PE
TS-M139-1 HLA-A*02:01 HIV gag$_{19-27}$ Tetramer-TLNAWVKVV-PE
TS-0008-1C HLA-A*02:01 HIV pol Tetramer-ILKEPVHGV-PE

HPV

TS-0031-1 HLA-A*02:01 HPV16 E7 Tetramer-YMLDLQPET-PE
TS-M047-1 HLA-A*02:01 HPV16 E6 Tetramer-KLPQLCTEL-PE
TS-M048-1 HLA-A*02:01 HPV16 E7 Tetramer-YMLDLQPETT-PE

Virus

TS-M143-1 HLA-A*02:01 HHV-6B U54 Tetramer-ILYGPLTRI-PE
TS-M017-1 HLA-A*02:01 HTLV-1 Tax$_{11-19}$ Tetramer-LLFGYPVYV-PE
TS-0012-1C HLA-A*02:01 Influenza M1 Tetramer-GILGFVFTL-PE
TS-M092-1 HLA-A*02:01 measles virus HA Tetramer-KLWCRHFCV-PE
TS-M122-1 HLA-A*02:01 VZV IE62 Tetramer-ALWALPHAA-PE

Mycobacterium tuberculosis

TS-M026-1 HLA-A*02:01 Mtb MPT51 Tetramer-TLAGKGISVV-PE
TS-M128-1 HLA-A*02:01 Mtb Ag85A$_{48-56}$ Tetramer-GLPVEYLQV-PE
TS-M129-1 HLA-A*02:01 Mtb Ag85A$_{242-250}$ Tetramer-KLIANNTRV-PE
TS-M131-1 HLA-A*02:01 Mtb Ag85B Tetramer-KLVANNTRL-PE
TS-M125-1 HLA-A*02:01 Mtb ESAT-6 Tetramer-AMASTEGNV-PE
TS-M127-1 HLA-A*02:01 Mtb Rv1614 Tetramer-FLYELIWNV-PE
TS-M130-1 HLA-A*02:01 Mtb Hsp65 Tetramer-KLQERLAKL-PE
TS-M132-1 HLA-A*02:01 Mtb 16 kDa Tetramer-GILTVSVAV-PE
TS-M133-1 HLA-A*02:01 Mtb 19 kDa Tetramer-VLTDGNPPEV-PE

Others

TS-M097-1 HLA-A*02:01 BTG1 Tetramer-TLWVDPYEV-PE
TS-M093-1 HLA-A*02:01 HA-1 Tetramer-VLHDDLLEA-PE
TS-M108-1 HLA-A*02:01 HA-2 Tetramer-YIGEVLVSV-PE
TS-M098-1 HLA-A*02:01 HA-8 Tetramer-RTLDKVLEV-PE
TS-M094-1 HLA-A*02:01 H-Y Tetramer-FIDSYICQV-PE
TS-M096-1 HLA-A*02:01 RNA helicase Tetramer-YLLPAIVHI-PE
TS-0029-1C HLA-A*02:01 Negative Tetramer-PE

HLA-E Tetramer

TS-ME01-1 HLA-E*01:03 HLA-A leader$_{3-11}$ Tetramer-VMAPRTLVL-PE
TS-ME02-1 HLA-E*01:03 Negative Tetramer-VMAPKTLVL-PE
TS-ME03-1 HLA-E*01:01 HLA-A leader$_{3-11}$ Tetramer-VMAPRTLVL-PE
TS-ME04-1 HLA-E*01:01 Negative Tetramer-VMAPKTLVL-PE

CD1d Tetramer

TS-HCD-1 Human CD1d Tetramer-PE

Class II Tetramer

TS-M801-1 HLA-DRB1*01:01 human CLIP$_{103-117}$ Tetramer-PE
TS-M802-1 HLA-DRB1*01:01 HIV gag$_{295-307}$ Tetramer-PE
TS-M803-1 HLA-DRB1*01:01 EBNA1$_{515-527}$ Tetramer-PE
TS-M804-1 HLA-DRB1*01:01 Influenza HA$_{306-318}$ Tetramer-PE
TS-M805-1 HLA-DRB1*04:05 human CLIP$_{103-117}$ Tetramer-PE
TS-M806-1 HLA-DRB1*04:05 Influenza HA$_{306-318}$ Tetramer-PE
TS-M809-1 HLA-DRB1*04:01 human CLIP$_{103-117}$ Tetramer-PE
TS-M810-1 HLA-DRB1*04:01 Influenza HA$_{306-318}$ Tetramer-PE
TS-M815-1 HLA-DRB1*01:01 HTLV-1 Tax$_{155-167}$ Tetramer-PE

T-Select PEPTIDEs

TS-0010-P HLA-A*02:01 CMV pp65 peptide
TS-0011-P HLA-A*02:01 EBV BMLF1 peptide
TS-M069-P HLA-A*02:01 EBV LMP2$_{356-364}$ peptide
TS-0018-P HLA-A*02:01 HBV core peptide
TS-M040-P HLA-A*02:01 HCV NS3$_{1406-1415}$ peptide
TS-M027-P HLA-A*02:01 HIV gag peptide
TS-M048-P HLA-A*02:01 HPV16 E7 peptide
TS-M017-P HLA-A*02:01 HTLV-1 Tax$_{11-19}$ peptide
TS-0012-P HLA-A*02:01 Influenza M1 peptide
TS-0009-P HLA-A*02:01 Mart-1 peptide
TS-M026-P HLA-A*02:01 MPT51 peptide
TS-M088-P HLA-A*02:01 MUC1 peptide
TS-M011-P HLA-A*02:01 NY-ESO-1 peptide
TS-M140-P HLA-A*02:01 WT1$_{37-45}$ peptide
TS-0029-P HLA-A*02:01 Negative peptide
TS-M801-P HLA-DRB1*01:01 human CLIP$_{103-117}$ peptide
TS-M802-P HLA-DRB1*01:01 HIV gag$_{295-307}$ peptide

Kits

4844 IMMUNOCYTO CD107a Detection Kit
AM-1005M IMMUNOCYTO Cytotoxicity Detection Kit

Please check our web site (http://ruo.mbl.co.jp) for up-to-date information on products and custom MHC Tetramers.