**Description**

B2M HLA-A*02:01 Lentivirus are replication incompetent, HIV-based, VSV-G pseudotyped lentiviral particles ready to transduce most mammalian cells, including primary and non-dividing cells. These viruses result in the expression of B2M (beta-2 microglobulin) HLA (human leukocyte antigen)-A*02:01 driven by an EF1a promoter. The lentiviruses also contain a puromycin selection marker (Figure 1).

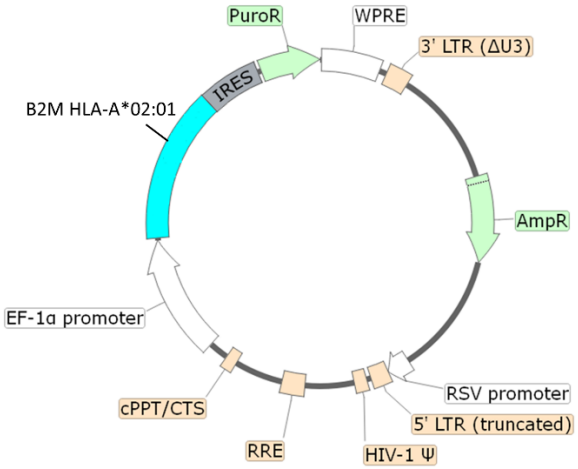


*Figure 1. Schematic of the lenti-vector used to generate B2M HLA-A*02:01 Lentivirus.*

**Background**

Human Leukocyte Antigen-A (HLA-A) is an MHC-I (major histocompatibility complex) heavy chain receptor, composed of HLA-A and β2-microglobulin (B2M). There are over 200 genes encoding HLA variants and this variability plays a critical role in adaptive immunity. HLA-A*02 is one of the most common class I types, with more than 300 variants HLA class I involved in presenting peptides that are typically between 8 to 11 amino acids. HLA-A*02:01 can bind 15-mer peptides, which can then be recognized by T cells. Studies in SCLC (small cell lung cancer) patients has shown that an ATAD2 (ATPase family AAA domain-containing protein 2) immunopeptide can be used in HLA-A*02-01-restricted patients with high reactivity. HLA-A*02:01 abilities can be exploited in cancer therapy.

**Application(s)**

- Expression of human B2M HLA-A*02:01 in cells of interest.
- Generate B2M HLA-A*02:01 expressing cell pools or stable cell lines by puromycin selection.

**Formulation**

The lentivirus particles were produced in HEK293T cells. They are supplied in medium containing 90% DMEM + 10% FBS. Virus particles can be packaged in custom formulations and produced at higher titers by special request, for an additional fee.

**Size and Titer**

Two vials (500 µl x 2) of lentivirus at a titer ≥$10^7$ TU/ml. The titer will vary with each lot; the exact value is provided with each shipment.

**Storage**

Lentiviruses are shipped with dry ice. For long-term storage, it is recommended to store the lentiviruses at -80°C for up to 12 months from date of receipt. Avoid repeated freeze-thaw cycles. Titers can drop significantly with each freeze-thaw cycle.





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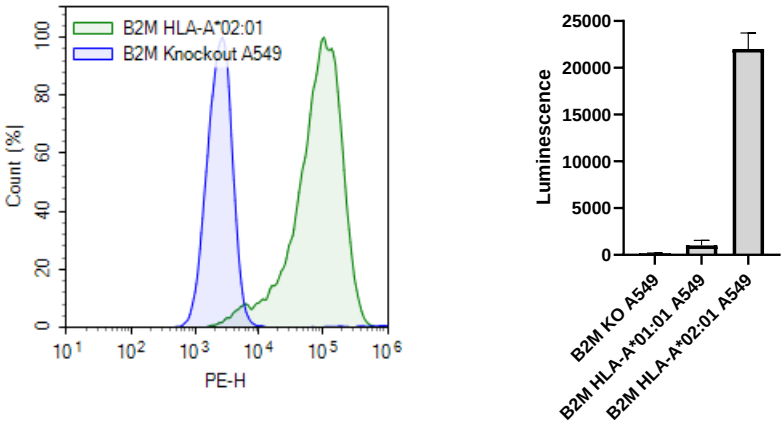
**Biosafety**

The lentiviruses are produced with a SIN (self-inactivation) lentivector which ensures self-inactivation of the lentiviral construct after transduction and after integration into the genomic DNA of the target cells. None of the HIV genes (gag, pol, rev) will be expressed in the transduced cells, as they are expressed from packaging plasmids lacking the packing signal and are not present in the lentivirus particle. Although the pseudotyped lentiviruses are replication-incompetent, they require the use of a Biosafety Level 2 facility. BPS Bioscience recommends following all local federal, state, and institutional regulations and using all appropriate safety precautions.

**Notes**

To generate an HLA-A*02:01 stable cell line, remove the growth medium 48 hours after transduction and replace it with fresh growth medium containing the appropriate amount of puromycin (as pre-determined from a killing curve, https://bpsbioscience.com/kill-curve-protocol), for antibiotic selection of transduced cells, followed by clonal selection.

**Validation Data**




A B

*Figure 2. Expression and function of HLA-A*02:01 in B2M Knockout A549 cells transduced with HLA-A*02:01 Lentivirus.*

**A.** Approximately 100,000 B2M Knockout A549 cells (#82871) were transduced with 1 x $10^6$ TU (100 µl of $10^7$ TU/ml) of HLA-A*02:01 Lentivirus via spinoculation (800 x *g* at 32°C for 30 minutes) in the presence of 5 µg/ml of Lenti-Fuse™ Polybrene Viral Transduction Enhancer (#78939). 48 hours post- transduction, the cells were stained with PE anti-human HLA-A, B, C Antibody (Biolegend #311406) and analyzed by flow cytometry. The y-axis represents the cell % and the x-axis indicates PE intensity.

**B.** B2M Knockout A549 cells (#82871) were transduced with B2M HLA-A*02:01 Lentivirus or B2M HLA-A*01:01 Lentivirus (#82423) and were loaded with 10 nM NY-ESO-1 peptide (p157-165; #78758), and co-cultured with NY-ESO-1 TCR (1G4) $CD8^+$ NFAT Luciferase Reporter Jurkat Cell Line (#78769) overnight. Luciferase activity was measured with ONE-Step™ Luciferase Assay System (#60690). The results are shown as raw luminescence readings. The NY-ESO-1 TCR (1G4) is a specific T cell receptor that recognizes the NY-ESO-1 epitope presented by the HLA-A*02:01 molecule. B2M knockout A549 cells were run in parallel as a negative control.

*Data is representative.*

**References**

Hassan C., *et al.*, 2014 *J Biol Chem* 290(5):2593-2603.
Yuan L., *et al.*, 2025 *eBioMedicine* 112: 105515.

**Troubleshooting Guide**

Visit bpsbioscience.com/lentivirus-faq for detailed troubleshooting instructions. For lot-specific information and all other questions, please visit https://bpsbioscience.com/contact.

**Related Products**

| *Products* | *Catalog #* | *Size* |
|---|---|---|
| HLA-A*01:01 Lentivirus | 82423 | 500 µl x 2 |
| B2M Knockout A549 Cell Line | 82871 | 2 vials |
| HLA-C*08:02 K562 Cell Line | 78974 | 2 vials |
| HLA-C*08:02 Lentivirus | 78930 | 500 µl x 2 |
| HLA-A/B/C Knockout Electroporation Kit | 82395 | 1 Kit |
| HLA-A/B/C Knockout HEK293T Cell Line | 82943 | 2 vials |

*Version 061625*