



Product Information Sheet for HRP-20041

TZM-GFP Human Cell Line (JC.53 Derived)

Catalog No. HRP-20041

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For research use only. Not for use in humans.

Contributor:

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Manufacturer:

NIH HIV Reagent Program

Product Description:

HRP-20041 is a novel human immunodeficiency virus type 1 (HIV-1) reporter cell line derived from the same parental clone JC.53, used previously to generate the widely-utilized indicator cell line TZM-bl.^{1,2} JC.53 cells are HeLa [human (*Homo sapiens*) cervical adenocarcinoma] cell derivatives overexpressing the three major HIV-1 co-receptors: CD4, CCR5 and CXCR4.^{1,3} JC.53 cells were engineered to express green fluorescent protein (GFP) under regulation of HIV Tat and Rev.¹ To produce TZM-GFP cells, parental JC.53 cells were transduced with a non-self-inactivating lentiviral reporter vector, pNL-GFP-RRE (SA), which harbors the HIV-1 long terminal repeat (LTR) and HIV-1 major donor and acceptor splice sites flanking the reporter gene hrGFP (human-optimized Renilla GFP), and cloned by limiting dilution.^{1,2}

Material Provided:

Each vial contains approximately 1.0 mL of cell culture suspension frozen in 80% Dulbecco's Modified Eagle's Medium, 10% fetal bovine serum and 10% dimethyl sulfoxide (DMSO).

Packaging/Storage:

This product was packaged aseptically, in screw-capped plastic cryovials. It should be stored at -100°C or colder, preferably in the vapor phase of a liquid nitrogen freezer. Storage at -70°C will result in loss of viability. To ensure the highest level of viability, the vial should be thawed and the culture initiated as soon as possible upon receipt. Any warming of the product during shipping and transfer must be avoided, as this will adversely affect the viability of the product after thawing. For transfer between freezers and shipping, the cells may be placed on dry ice for brief periods, although use of a portable liquid nitrogen carrier is preferred. Please read the following recommendations prior to reconstituting this material.

Safety Precautions:

When handling frozen vials, it is highly recommended that protective gloves, lab coat and full-face mask be worn. Even brief exposure to the ultra-cold temperature can cause tissue damage from frostbite. Also, some vials may slowly fill with liquid nitrogen if they have been immersed during cryogenic storage. When thawing, the liquid nitrogen may rapidly expand as it changes to gas, breaking the vial or cap with explosive force, sending debris flying with enough velocity to cause injury. Store and use in areas with adequate ventilation.

Thawing and Growth:

Prior to thawing the TZM-GFP cells, prepare growth medium (GM) for use. TZM-GFP cells are grown in Dulbecco's Modified Eagle's Medium containing 4 mM L-glutamine, 4500 milligrams per liter glucose, 1 mM sodium pyruvate and 1500 milligrams per liter sodium bicarbonate, supplemented with 10% fetal bovine serum (ATCC® 30-2020™). This GM is formulated for use with a 5% CO₂ in air atmosphere.

Rapidly thaw the vial of cells in a 37°C water bath with gentle agitation. To reduce the risk of contamination, keep the cap and O-ring of the vial out of the water and repeatedly check the cap for tightness during thawing. Remove from the water bath immediately, when thawed. Dry the vial with a sterile wiper, decontaminate using a wiper soaked with 70% isopropyl alcohol and let the vial air dry. Aseptically open the vial, remove the vial contents and add to 4 mL of GM in a centrifuge tube. Centrifuge the cell suspension at 125 to 200× for 8 to 10 minutes at 18 to 25°C. Discard the supernatant and resuspend the cell pellet in 10 mL of pre-warmed GM. Transfer the cell suspension into a 75 cm² tissue culture flask. Incubate the new culture at 37°C and 5% CO₂. Replace the GM with fresh GM every 2 to 3 days and incubate until the cell sheet is approximately 80% confluent.

Sub-culture procedure.

Aseptically remove the GM and discard. Briefly rinse the cell layer with 4 to 15 mL of Ca²⁺- and Mg²⁺-free Dulbecco's phosphate-buffered saline (PBS) to remove all traces of serum. Discard the PBS. Add 2 to 8 mL of 0.05% trypsin-EDTA to the culture flask and incubate the flask at 37°C until cell layer is dispersed (usually within 3 minutes but no longer than 15 minutes). *Note: To avoid clumping, do not agitate the cells by hitting or shaking the flask.* Add an equal volume of GM and aspirate cells by gently pipetting. Perform a cell count and add appropriate aliquots of the cell suspension to new culture vessels at a sub-cultivation ratio of 1:10. Adjust the volume of GM to 15 to 20 mL for a 75 cm² flask. Incubate cultures at 37°C and 5% CO₂. Replace the GM with fresh GM every 2 to 3 days and incubate until the cell sheet is approximately 80% confluent.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through the NIH HIV Reagent Program, NIAID, NIH: TZM-GFP Human Cell Line (JC.53 Derived), HRP-20041, contributed by David G. Russell and David W. Gludish."

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HRP-20041_11JAN2022

Page 1 of 2



Product Information Sheet for HRP-20041

Biosafety Level: 2

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories. 6th ed. Washington, DC: U.S. Government Printing Office, 2020; see www.cdc.gov/biosafety/publications/bmbl5/index.htm.

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References:

1. Gludish, D. W., et al. "TZM-gfp Cells: A Tractable Fluorescent Tool for Analysis of Rare and Early HIV-1 Infection." Sci. Rep. 10 (2020): 19900. PubMed: 33199722.
2. Russell, D. G. and D. W. Gludish, Personal Communication.
3. Platt, E. J., et al. "Effects of CCR5 and CD4 Cell Surface Concentrations on Infections by Macrophagetropic

Isolates of Human Immunodeficiency Virus Type 1." J. Virol. 72 (1998): 2855-2864. PubMed: 9525605.

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HRP-20041_11JAN2022

Page 2 of 2