THP1-Lucia™ ISG Cells

Interferon Regulatory Factor-Inducible Reporter Monocytes

Catalog code: thpl-isg

https://www.invivogen.com/thp1-lucia-isg

For research use only

Version 21I27-MM

PRODUCT INFORMATION

Contents and Storage

- **1 vial of THP1-Lucia™ ISG cells** (3-7 x 10^6 cells) in freezing medium.
- **1 ml of Zeocin™** (100 mg/ml). Store at 4 °C or at -20 °C.*
- **1 ml Normocin™** (50 mg/ml), a formulation of three antibiotics active against mycoplasmas, bacteria and fungi. Store at -20 °C.*

*The expiry date is specified on the product label.

- **1 pouch of QUANTI-Luc™**. Store QUANTI-Luc™ pouch at -20°C for 12 months. Reconstituted QUANTI-Luc™ medium is stable for 1 week at 4°C and for 1 month at -20°C. Protect QUANTI-Luc™ from light.

Note: Data sheets for all components are available on our website.

Handling Cells Upon Arrival

Cells must be thawed **immediately** upon receipt and grown according to handling procedures to ensure the best cell viability and assay performance. If you are unable to thaw the cells immediately, frozen cells may be placed in liquid nitrogen until you are ready to thaw and propagate them, however, this may reduce cell viability.

Quality Control

- THP1-Lucia™ ISG cells produce Lucia luciferase following stimulation with cytosolic DNA sensors (CDS) ligands that trigger the interferon (IFN) signaling pathway.
- The stability of this cell line for 20 passages following thawing has been verified.
- THP1-Lucia™ ISG cells are guaranteed mycoplasma-free.

Cell Line Stability

Cells will undergo genotypic changes resulting in reduced responsiveness over time in normal cell culture conditions. Genetic instability is a biological phenomenon that occurs in all stably transfected cells. Therefore, it is critical to prepare an adequate number of frozen stocks at early passages.

USE RESTRICTIONS

These cells are distributed for research purposes only.

This product is covered by a Limited Use License. By use of this product, the buyer agrees with the terms and conditions of all applicable Limited Use Label Licenses.

For non-research use, such as screening, quality control or clinical development, contact info@invivogen.com.

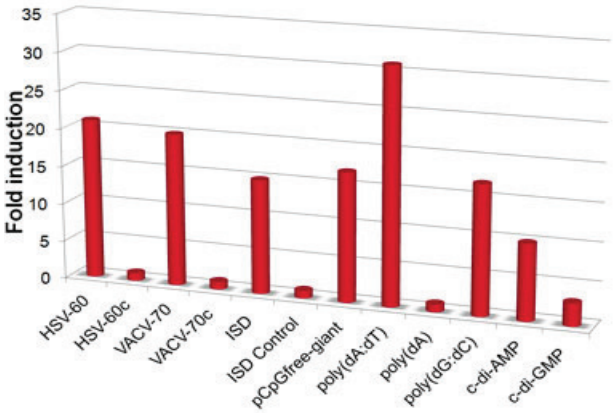

Figure 1: IRF response of THP1-Lucia™ ISG cells. Cells were transfected with CDS ligands (1 µg/ml of HSV-60, HSV-60c, VACV-70, VACV-70c, ISD, ISD Control or 0.3 µg/ml pCpGfree-giant, poly(dA:dT), poly(dA), poly(dG:dC) using LyoVec™ or directly stimulated with 10 µg/ml c-di-AMP or c-di-GMP. After 24h incubation, the levels of IRF-induced Lucia luciferase were determined using QUANTI-Luc™.

PRODUCT DESCRIPTION

THP1-Lucia™ ISG (interferon-stimulated genes) cells were derived from the human monocytic cell line THP-1, which represents a model of choice to study the activation and signaling of cytosolic DNA sensors (CDSs). Indeed, THP-1 cells have been shown to express all the CDSs identified so far[1-3], with the exception of DAI[4]. THP1-Lucia™ ISG cells express the secreted luciferase Lucia reporter gene under the control of an IRF-inducible promoter. This composite promoter is comprised of five IFN-stimulated response elements (ISRE) fused to an ISG54 minimal promoter, which is unresponsive to activators of the NF-κB or AP-1 pathways. As a result, THP1-Lucia™ ISG cells allow the monitoring of the IRF pathway by determining the activity of Lucia luciferase. The levels of IRF induced Lucia luciferase in the cell culture supernatant are readily assessed with QUANTI-Luc™, a Lucia luciferase detection reagent. THP1-Lucia™ ISG cells are highly responsive to CDS ligands, such as transfected double-stranded nucleic acids (see figure).

THP1-Lucia™ ISG cells are resistant to Zeocin™.

1. Zhang Z. *et al.*, 2011. The helicase DDX41 senses intracellular DNA mediated by the adaptor STING in dendritic cells. Nat Immunol.12(10):959-65. **2. Veeranki S. *et al.*, 2011.** IFI16 protein mediates the anti-inflammatory actions of the type-I interferons through suppression of activation of caspase-1 by inflammasomes. PLoS One. 6(10):e27040. **3. Arakawa R. *et al.*, 2010.** Characterization of LRRFIP1. Biochem Cell Biol. 88(6):899-906. **4. Lippmann J. *et al.*, 2010.** IFNbeta responses induced by intracellular bacteria or cytosolic DNA in different human cells do not require ZBP1 (DLM-1/DAI). Cell Microbiol. 10(12):2579-88.

TECHNICAL SUPPORT
InvivoGen USA (Toll-Free): 888-457-5873
InvivoGen USA (International): +1 (858) 457-5873
InvivoGen Europe: +33 (0) 5-62-71-69-39
InvivoGen Asia: +852 3622-3480
E-mail: info@invivogen.com

FAQ Any questions about our cell lines? Visit our FAQ page.

InvivoGen
www.invivogen.com

SAFETY CONSIDERATIONS

Biosafety Level 1

HANDLING PROCEDURES

Required Cell Culture Medium

- **Growth Medium:** RPMI 1640, 2 mM L-glutamine, 25 mM HEPES, 10% heat-inactivated fetal bovine serum (30 min at 56°C), 100 µg/ml Normocin™, Pen-Strep (100 U/ml-100 µg/ml)

Initial culture of all THP-1 derived cells must be performed in growth medium containing 20% heat-inactivated FBS.

Note: The use of Normocin™ together with Pen-Strep is required to keep the cells free of microbial contaminants. Contamination of this cell line may activate TLRs resulting in differentiation of the monocytes and activation of the reporter gene.

- **Freezing Medium:** 90% fetal bovine serum (FBS), 10% DMSO
- **Test Medium:** RPMI 1640, 2 mM L-glutamine, 25 mM HEPES, 10% heat-inactivated fetal bovine serum, Pen-Strep (100 U/ml-100 µg/ml)

Required Selective Antibiotic

Zeocin™

Initial Culture Procedure

The first propagation of cells should be for generating stocks for future use. This ensures the stability and performance of the cells for subsequent experiments.

1. Thaw the vial by gentle agitation in a 37°C water bath. To reduce the possibility of contamination, keep the O-ring and cap out of the water. Thawing should be rapid.
2. Remove the vial from the water bath as soon as the contents are thawed, and decontaminate by dipping in or spraying with 70% ethanol.

Note: All steps from this point should be carried out under strict aseptic conditions.

3. Transfer cells in a vial containing 15 ml of pre-warmed growth medium.
4. Centrifuge vial at 150 x g (RCF) for 10 minutes.
5. Remove supernatant containing the cryoprotective agent and resuspend cells with 1 ml of growth medium. **Do not add selective antibiotics until the cells have been passaged twice.**
6. Transfer the vial contents to a 25 cm^2 tissue culture flask containing 5 ml of growth medium.
7. Place the culture at 37°C in 5% CO_2.

Frozen Stock Preparation

1. Resuspend cells at a density of 5-7 x 10^6 cells/ml in freezing medium prepared extemporaneously with cold FBS.
2. Aliquot 1 ml cells into cryogenic vials.
3. Place vials in a freezing container and store at -80°C overnight.
4. Transfer vials to liquid nitrogen for long term storage.

Note: If properly stored, cells should remain stable for years.

Cell Maintenance

1. After cells have recovered and are growing well (after at least one passage), maintain and subculture the cells in growth medium. To maintain selection pressure, add 100 µg/ml of Zeocin™ to the growth medium every other passage.
2. Pass the cells every 3 days by inoculating 5 x 10^5 cells/ml. Do not allow the cell concentration to exceed 2 x 10^6 cells/ml.

Note: To ensure the best results:

- Use THP1-Lucia™ ISG cells with less than 20 passages.
- *Handling of cells should be as short as possible to prevent any damage resulting from the prolonged stay at room temperature without 5% CO_2.*

PMA-INDUCED DIFFERENTIATION (OPTIONAL)

Following Phorbol 12-myristate 13-acetate (PMA) treatment, THP1-Lucia™ ISG cells are more sensitive to IFN-inducers, such as transfected Poly(dA:dT), while the response to TLR ligands, such as Pam3CSK4, is diminished.

Day 1

1. Add 180 µl of THP1-Lucia™ ISG cell suspension per well of a 96-well plate (1 x 10^5 cells/well).
2. Treat THP1-Lucia™ ISG cells with 20 µl of PMA (final concentration 20-50 ng/ml) for 3 hours at 37°C in 5% CO_2.
3. Wash cells gently with pre-warmed and add 200 µl pre-warmed growth medium.

Day 4

4. Wash cells with pre-warmed PBS and add 180 µl growth medium.
5. Add 20 µl of an IFN inducer, such as Poly(dA:dT)/LyoVec™.
6. Incubate overnight at 37°C in 5% CO_2.

DETECTION OF IFN INDUCTION

Sample Preparation

1. Resuspend all powdered samples in endotoxin-free water to avoid activation of TLR4 of the THP1-Lucia™ ISG cell line.
2. Warm the samples at 37°C before use.

Notes:

- *Avoid testing of pure samples soluble only in ethanol or DMSO: these solutions are toxic to the cell line and can result in false negative results.*
- *Samples containing a phosphatase activity cannot be tested as they can result in false positive results (like serum not previously heat-inactivated).*

IFN Induction

1. Centrifuge cells at 150 x g (RCF) for 10 minutes or 300 x g (RCF) for 5 minutes.
2. Remove supernatant and resuspend THP1-Lucia™ ISG cells at 5 x 10^5 cells/ml in fresh, pre-warmed growth medium.
3. Add 20 µl of sample per well including Poly(dA:dT)/LyoVec™ as the positive control and endotoxin free water as a negative control (use new tips for each well to avoid cross-contamination).
4. Add 180 µl of cell suspension (1 x 10^5 cells) per well of a flat-bottom 96-well plate.
5. Incubate the plate at 37°C in a CO_2 incubator for 18-24 h.
6. Prepare QUANTI-Luc™ following the instructions on the pouch.
7. Set the luminometer with the following parameters: 50 µl of injection, end-point measurement with a 4 second start time and 0.1 second reading time.
8. Pipet 10 µl of THP1-Lucia™ ISG cell culture supernatant per well in a 96-well white (opaque) or black plate, or a luminometer tube.
9. Prime the injector with the QUANTI-Luc™ assay solution and proceed with the measurement.

RELATED PRODUCTS

Product	Description	Cat. Code
c-di-GMP	CDS ligand	tlrl-nacdg
LyoVec™	Transfection reagent	lyec-12
Normocin™	Antimicrobial agent	ant-nr-1
Pam3CSK4	TLR2 ligand	tlrl-pms
Poly(dA:dT)/LyoVec™	RIG-I & CDS ligand	tlrl-patc
PMA	Phorbol 12-myrisate 13-acetate	tlrl-pma
QUANTI-Luc™	Lucia detection reagent	rep-qlc1
Zeocin™	Selective antibiotic	ant-zn-1

TECHNICAL SUPPORT
InvivoGen USA (Toll-Free): 888-457-5873
InvivoGen USA (International): +1 (858) 457-5873
InvivoGen Europe: +33 (0) 5-62-71-69-39
InvivoGen Asia: +852 3622-3480
E-mail: info@invivogen.com

QUANTI-Luc™

A coelenterazine-based luminescence assay reagent

Catalog code: rep-qlc1, rep-qlc2

https://www.invivogen.com/quanti-luc

For research use only

Version 19A04-MM

PRODUCT INFORMATION

Contents

QUANTI-Luc™ is provided as packs of individually sealed pouches.

- rep-qlc1: 2 pouches of QUANTI-Luc™
- rep-qlc2: 5 pouches of QUANTI-Luc™

Each pouch contains everything needed to prepare 25 ml of reagent allowing the preparation of 500 wells of a 96-well plate.

Storage and Stability

- Store QUANTI-Luc™ pouches at -20°C for 12 months.
- Reconstituted QUANTI-Luc™ is stable for 1 week at 4°C and for 1 month at -20°C. Prepare aliquots to avoid repeated freeze-thaw cycles.

Note: *This product is photosensitive and should be protected from light.*

DESCRIPTION

QUANTI-Luc™ is an assay reagent containing all the components required to quantitively measure the activity of Lucia luciferase and other coelenterazine-utilizing luciferases. QUANTI-Luc™ contains the coelenterazine substrate and stabilizing agents for the luciferase reaction. The light signal produced is quantified using a luminometer and expressed as relative light units (RLU). The signal produced correlates to the amount of luciferase protein expressed, indicating promoter activity in the reporter assay.

QUANTI-Luc™ is optimized for use with Lucia luciferase reporter cell lines. Lucia luciferase is a secreted coelenterazine luciferase encoded by a synthetic gene. As Lucia luciferase is secreted, it can be directly measured in the cell culture medium using bioluminescent assays.

InvivoGen provides a recombinant Lucia luciferase protein (see Related Products) which is a positive control for QUANTI-Luc™. A dilution series of the recombinant Lucia luciferase protein can also be used to determine the linear range of the assay.

METHODS

Preparation of QUANTI-Luc™

1. Pour the pouch contents into a 50 ml screw cap tube.
2. Add 25 ml of sterile water.
3. Swirl product gently until powder is completely dissolved.
4. Use QUANTI-Luc™ assay solution immediately or store until required for use. Reconstituted QUANTI-Luc™ can be stored for 1 week at 4°C and for 1 month at -20°C. Prepare aliquots to avoid repeated freeze-thaw cycles.

Note: *This product is photosensitive and should be protected from light.*

Detection of luciferase activity from cell culture medium

To obtain **end-point readings** using a luminometer **with an injector**.

1. Set the luminometer with the following parameters: 50 µl of injection, end-point measurement with a 4 second start time and 0.1 second reading time.
2. Pipet 10-20 µl of sample per well into a 96-well white (opaque) or black plate, or a luminometer tube.
3. Prime the injector with the QUANTI-Luc™ assay solution and proceed **immediately** with the measurement.

To obtain **end-point readings** using a luminometer **without injectors**.

1. Set the luminometer with a 0.1 second reading time.
2. Pipet 10-20 µl of sample per well into a 96-well white (opaque) or black plate, or a luminometer tube.
3. Add 50 µl of QUANTI-Luc™ assay solution to each well or tube.
4. Gently tap the plate several times to mix (do **not** vortex).
5. Proceed **immediately** with the measurement.

RELATED PRODUCTS

Product	Catalog Code
QUANTI-Luc™ Gold (For standard and HTS assays)	rep-qlcg1
pSelect-zeo-Lucia™ (expression plasmid)	psetz-lucia
Recombinant Lucia luciferase protein	rec-lucia
Reporter Cells	
THP1-Dual™ (IRF-Lucia/NF-κB-SEAP) Cells	thpd-nfis
THP1-Lucia™ NF-κB Cells	thp1-nfkb

For a complete list of InvivoGen's Lucia luciferase Reporter Cell Lines visit https://www.invivogen.com/lucia-reporter-cells.

TECHNICAL SUPPORT
InvivoGen USA (Toll-Free): 888-457-5873
InvivoGen USA (International): +1 (858) 457-5873
InvivoGen Europe: +33 (0) 5-62-71-69-39
InvivoGen Asia: +852 3622-3480
E-mail: info@invivogen.com