



DELFIA[®] EuTDA Cytotoxicity Reagents

For research Use Only

DELFIA[®] EuTDA Cytotoxicity Reagents AD0116 For Research Use Only

INTENDED USE

This product is intended for loading of cells to be used in short term cytotoxicity tests performed utilizing time-resolved fluorometry in the detection.

INTRODUCTION

DELFIA[®] EuTDA Cytotoxicity Reagents contain

- BATDA Reagent for loading of cells
- Lysis Buffer for lysis of cells to quantitate maximum release
- Europium Solution and microtitration plates for measuring Eu signal

The procedure is based on loading target cells with a fluorescence enhancing ligand (BATDA, bis (acetoxymethyl) 2,2':6',2"- terpyridine- 6,6"- dicarboxylate). The hydrophobic ligand penetrates the membrane quickly. Within the cell the ester bonds are hydrolyzed to form a hydrophilic ligand (TDA, i.e. 2,2':6',2"- terpyridine-6,6"- dicarboxylic acid) which no longer pass the membrane. After cytolysis the ligand is released and introduced to the DELFIA Europium Solution. The europium and the ligand form a highly fluorescent and stable chelate (EuTDA). The measured signal correlates directly with the amount of lysed cells.

PACKAGE CONTENTS

The reagents are sufficient for at least 10 x 96-wells when the suggested loading protocol is used.

Component	Quantity	Shelf life and storage
DELFIA BATDA Reagent	1 vial, 50 µL	4 °C until expiry date stated on the vial label.

Ready-for-use reagent dissolved in dimethylsulphoxide (DMSO).

Note: DMSO is absorbed through skin, is irritating to eyes and skin, causes nausea, vomiting and tiredness. Use gloves approved for chemicals. If a risk of splashing occurs, wear safety goggles. In case of contact with eyes rinse immediately with plenty of water and seek medical advice. After contact with skin wash immediately with plenty of water. Handling in fume cupboard is recommended.

DELFLIA Lysis Buffer	1 vial, 0.5 mL	4 °C until expiry date stated on the kit label.
----------------------	----------------	---

Ready-for-use solution containing 0.03 % digitonin and 19 % dimethylsulphoxide (DMSO).

Note: Digitonin is toxic by inhalation, in contact with skin and if swallowed. In contact with eyes or skin rinse immediately with plenty of water and seek medical advice in case of splashes in eyes.

DMSO is absorbed through skin, is irritating to eyes and skin, causes nausea, vomiting and tiredness. Use gloves approved for chemicals. If a risk of splashing occurs, wear safety goggles. In case of contact with eyes rinse immediately with plenty of water and seek medical advice. After contact with skin wash immediately with plenty of water. Handling in fume cupboard is recommended.

DELFLIA Europium Solution	1 bottle, 200 mL	4 °C until expiry date stated on the kit label.
---------------------------	------------------	---

Ready-for-use europium solution based on acetate buffer (pH 4).

DELFLIA Microtitration Plates	10 plates	+2 - +25 °C
-------------------------------	-----------	-------------

MATERIALS REQUIRED BUT NOT SUPPLIED WITH THE PRODUCT

1. 96-well plates (V-bottom)
2. Suitable wash solution for the cell line, balanced salt solution like PBS or the cell culture medium
3. Cell culture medium, e.g. RPMI 1640 (Gibco)
4. Time-resolved fluorometer: VICTOR™, ViewLux™, EnVision™ or Fusion™
5. Pipette for dispensing the Europium Solution - Eppendorf Multipette (prod. no. 1296-014) with 5 mL Combitips (prod. no. 1296-016), or alternatively the DELFLIA Plate Dispense (prod. no. 1296-041)
6. Automatic shaker - DELFLIA Plateshake (prod. no. 1296-003/004)

WARNINGS AND PRECAUTIONS

DELFLIA EuTDA Cytotoxicity Reagents are intended for *in vitro* research use only.

The protocols given in this insert are only guidelines and they may need optimization depending on the cell line used.

VICTOR, ViewLux, EnVision and Fusion are trademarks of PerkinElmer, Inc.

NOTE: The DELFIA BATDA Reagent is dissolved in dimethylsulphoxide (DMSO) and the Lysis Buffer contains digitonin and dimethylsulphoxide (DMSO).

DMSO is absorbed through skin, is irritating to eyes and skin, causes nausea, vomiting and tiredness. Use gloves approved for chemicals. If a risk of splashing occurs, wear safety goggles. In case of contact with eyes rinse immediately with plenty of water and seek medical advice. After contact with skin wash immediately with plenty of water. Handling in fume cupboard is recommended.

Digitonin is toxic by inhalation, in contact with skin and if swallowed. In contact with eyes or skin rinse immediately with plenty of water and seek medical advice in case of splashes in eyes.

Discard as hazardous waste, in accordance with local regulations.

PROCEDURAL NOTES

Take care that water is not introduced to the fluorescence enhancing ligand (DELFLIA BATDA Reagent) vial when pipetting the reagent to avoid hydrolysis of the ligand. Make sure that the reagent is thawed and mixed before use. The reagent should be frozen at +4 °C. If the reagent is melted, it may be inactive. Repeated opening of the vial may cause hydrolysis of the reagent.

Europium solution contains very high europium levels. Thus, the handling should be well separated from BATDA reagent handling. Due to the very low detection limit of europium ($10E-18$ mol), a dedicated pipette for Europium Solution is required to prevent contamination problems. The contamination of BATDA Reagent will result in high fluorescent background. This should be kept in mind also with other DELFIA assays performed in the laboratory.

Depending on the cell line the following parameters may have to be adjusted before loading:

Loading temperature:

+4 - +37 °C, use the temperature your cell line stands best. High temperature correlates to faster loading and may be more gentle to sensitive cell lines.

Loading time:

5 - 30 minutes, usually a very sensitive cell line should not be loaded longer than 5 - 10 minutes. The loading time needs to be optimized for each cell line and for each type of experiment separately.

Loading concentration:

Sometimes it may be necessary to increase the amount of BATDA to achieve sufficiently high fluorescence. However, it is recommended to use as low concentrations as possible to avoid

unnecessary washing. Accumulation of large amounts of the hydrolysis product formaldehyde in target cells may be toxic to cells.

Wash steps:

When washing the cells, suspend the cells very carefully and try to wash fast. If necessary, add 1 - 10 mmol/L Probenecid (Sigma P8761) or Sulfinpyrazone (Sigma S9509) into the wash solution to lower the spontaneous release. Check that the pH of the wash buffer is not affected by addition of probenecid or sulfinpyrazone.

Assay optimizations:

The amount of target cells per well in an assay is normally around 5000 - 10000.

The assay incubation time in step 4 ("CYTOTOXICITY ASSAY PROTOCOL") should not exceed 4 hours in order to get acceptable level of spontaneous release.

The monitoring of the assay kinetics is possible in step 6 ("CYTOTOXICITY ASSAY PROTOCOL"). The samples and the controls (20 μ L) can be transferred at the time points of interest (5 min. - 4 h).

PREPARATION OF REAGENTS

1. Heat up the Lysis Buffer on a water bath (+37 °C) prior to use. Digitonin in the Lysis Buffer may precipitate during storage. Should precipitation occur, warm the Lysis Buffer to +50 - +60 °C to completely dissolve the digitonin.
2. Let the reagents reach room temperature (+20 - +25 °C) before use.
3. Check that the DELFIA BATDA Reagent is thoroughly thawed and mixed before use.

LOADING PROTOCOL

1. Wash the cells once with a balanced salt solution (eg. PBS) or medium.
2. Adjust the number of cells to about 1×10^6 cells/mL with the culture medium. Add 2 - 4 mL of cells to 5 μ L of the fluorescence enhancing ligand. Incubate for 5 - 30 minutes at +37 °C.
3. Spin down the cells and resuspend in wash buffer.
4. Wash the cells 3 - 5 times. Resuspend the pellet carefully. Avoid contamination from one wash step to the following.
5. After the final wash resuspend the pellet in culture medium and adjust to about 5×10^4 cells/mL.

NOTE: Do not incubate or leave the cells waiting at this point, proceed immediately to the next step in the assay.

CYTOTOXICITY ASSAY PROTOCOL

1. Set up wells for detection of background, spontaneous release and maximum release (see below for the definition).
2. Pipette 100 μL of loaded target cells (5000 cells) to a V-bottom plate.
3. Add 100 μL of effector cells of varying cell concentrations. Effector to target ratio ranges from 6:1 to 100:1 are commonly used for natural killer cells.
4. Incubate for 2 hours in a humidified 5 % CO_2 atmosphere at +37°C.
5. Centrifugation for 5 minutes at 500x g is recommended. This is not compulsory if in step 6 the supernatant is transferred carefully (avoiding cells) from the V-bottom plate.
6. Transfer 20 μL of the supernatant to a flat-bottom plate (included in the kit).
7. Add 200 μL of Europium Solution.
8. Incubate for 15 minutes at room temperature using the DELFIA Plateshake.
9. Measure the fluorescence in the time-resolved fluorometer.

Definitions of background, spontaneous release and maximum release

Background (= media without cells): Take an aliquot of the loaded target cells immediately after dilution in culture medium. Do not incubate the cells. Centrifuge the cells down and pipette 100 μL of the supernatant into the wells and add 100 μL of the cell culture medium. Transfer the same way as the samples.

Spontaneous release (= target cells without effector cells): Incubate the target cells (100 μL) with 100 μL of cell culture medium instead of effector cells during the assay. Transfer the same way as the samples.

Maximum release (= lysed target cells): Incubate the target cells (100 μL) with 100 μL of cell culture medium supplemented with 10 μL of Lysis Buffer. Transfer the same way as the samples.

Formulas for calculating

$$\% \text{ Specific release} = \frac{\text{Experimental release (counts)} - \text{Spontaneous release (counts)}}{\text{Maximum release (counts)} - \text{Spontaneous release (counts)}} \times 100$$

$$\% \text{ Spontaneous release} = \frac{\text{Spontaneous release (counts)} - \text{background (counts)}}{\text{Maximum release (counts)} - \text{background (counts)}} \times 100$$

Note that in some cases the effector cells are more effective for lysing the target cells than is the Lysis Buffer. In that case, the experimental release may be higher than the maximum release and these formulas can not be applied.

LITERATURE

1. Blomberg, K., Hautala, R., Lövgren, J., Mukkala, V-M., Lindqvist, C. and Åkerman, K. (1996): Time-resolved fluorometric assay for natural killer activity using target cells labelled with a fluorescence enhancing ligand. *J. Immunol. Methods* **193**, 199-206.
2. Ding, Yuan-Ding, Smith, K.J., Garboczi, D.N., Utz, U., Biddison, W.E. and Wiley, D.C. (1998): Two human T cell receptors bind in a similar diagonal mode to the HLA-A2/Tax peptide complex using different TCR amino acids. *Immunity* **8**, 409-411.
3. Leino, L., Saarinen, K., Kivistö, K., Blomberg, K. and Punnonen, K. (1998): Time-resolved fluorometric assay for leukocyte adhesion using a fluorescence enhancing ligand. *Scand. J. Clin. Lab. Invest.* **58**, S228.
4. Tandon, N.N., Nakamura, T. and Kambayashi, J. (1997): A new simplified, gentle cell labelling method for non-radioactive platelet adhesion assay based on time resolved fluorometry. 16th International Society for Thrombosis & Haemostasis, Florence, Italy, June 6-12, 1997.

LIMITED WARRANTY

PerkinElmer Life and Analytical Sciences warrants that, at the time of shipment, the products sold by it are free from defects in material and workmanship and conform to specifications that accompany the product.

PerkinElmer Life and Analytical Sciences makes no other warranty, express or implied with respect to the products, including any warranty of merchantability or fitness for any particular purpose. Notification of any breach of warranty must be made within 30 days of receipt unless provided in writing by PerkinElmer Life and Analytical Sciences. No claim shall be honored if the customer fails to notify PerkinElmer Life and Analytical Sciences within the period specified.

The sole and exclusive remedy of the customer for any liability of PerkinElmer Life and Analytical Sciences of any kind including liability based upon warranty (express or implied whether contained herein or elsewhere), strict liability contract or otherwise is limited to the replacement of the goods or the refunds of the invoice price of goods. PerkinElmer Life and Analytical Sciences shall not in any case be liable for special, incidental or consequential damages of any kind.

PerkinElmer Life and Analytical Sciences
549 Albany Street, Boston
MA, 02118
<http://www.perkinelmer.com>
August 06



