

# Cholesterol Detection Kit (cell-based)

11/14

(Catalog # K587-100; 100 assays; Store at -20°C)

## I. Introduction:

Cholesterol is an essential structural component of animal cell membranes. It is required to maintain membrane structural integrity and fluidity. Cholesterol also serves as a precursor for the biosynthesis of several hormones, bile acid and vitamin D. Plasma membrane contains majority of the cellular cholesterol (80-90%) whereas little cholesterol resides in endoplasmic reticulum and in mitochondrial membrane. Transport of intracellular cholesterol within the cells to different compartments is through vesicular and non-vesicular pathways. Defects in these transport processes can alter cellular cholesterol metabolism resulting in pathological conditions. Filipin III is widely used as a probe for sterol localization in membranes. Interaction with cholesterol alters Filipin absorption and fluorescence spectra. This assay provides a simple, easy to perform, histochemical method of identification of unesterified cholesterol.

## II. Application:

- Screen/study/characterize stimulators/inhibitors that affect cholesterol transport and localization

## III. Sample Type:

- Cells

## IV. Kit Contents:

Components	K587-100	Cap Code	Part Number
Fixative Solution	10 ml	WM	K587-100-1
Assay Buffer	100 ml	NM	K587-100-2
Staining Dye	10 µl	Red	K587-100-3
Inhibitor (U-18666A, 2.5 mM)	10 µl	Blue	K587-100-4

## V. User Supplied Reagents & Equipment:

- 6-well, 12-well, 24-well or 96-well plate
- 100% Ethanol
- 37°C Incubator with 5% CO<sub>2</sub>
- Light and fluorescence microscope with UV filter set Ex/Em = 340-380/385-470 nm.

## VI. Storage Conditions and Reagent Preparation:

Store kit at -20°C. Read entire protocol before performing the assay. Open all reagents under sterile conditions (e.g. cell culture hood).

- **Fixative Solution:** Store at room temperature.
- **Assay Buffer:** Store at -20°C. Warm to 37°C before use.
- **Staining Dye:** Light sensitive, do not expose to intense light. Add 200 µl of 100% ethanol (not provided) to the vial. Aliquot and store at -80°C for long-term storage.
- **Inhibitor (U-18666A):** Store at -20°C. Dilute in Assay Buffer as per the assay requirement.

## VII. Cholesterol Detection Protocol:

This protocol is for a 96-well plate. Adjust the volume according to the plate size.

1. **Cell Culture:** Seed 2-3 x 10<sup>4</sup> cells/well in a 96-well plate in desired media. Grow cells overnight in 37°C incubator containing 5% CO<sub>2</sub>. Next day, treat cells with compounds of interest in 100 µl media. As a control, we recommend treating cells with vehicle alone. For inhibitor control, treat cells with diluted Inhibitor (U-18666A, a cholesterol transport inhibitor). Grow cells for 48-72 hrs or for desired time period.

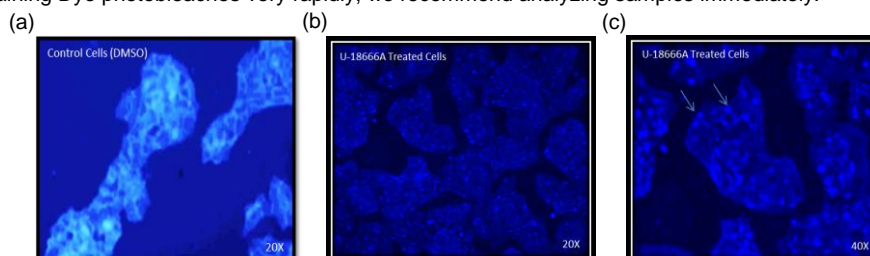
**Note:** Treatment with Inhibitor (U-18666A) will vary depending on the cell type. For HepG2 cell line we recommend using 1.25 µM.

2. **Cell Staining:** Remove culture media from wells. Wash cells with 100 µl Assay Buffer. Add 50-100 µl of Fixative Solution and incubate for 10 min. Wash cells with 100 µl Assay Buffer 2-3 times. Dilute Staining Dye 1:100 in Assay Buffer just before use and add 100 µl/well. Incubate in dark for 30-60 min at 37°C. Carefully remove the Assay Buffer containing dye using a pipette without disturbing the cells. Gently wash the cells 2-3 times with 100 µl Assay Buffer.

**Note:** Cells can be stained directly with the Staining Dye without adding Fixative Solution (fixing of cells).

3. **Detection:** Examine cells using light and fluorescence microscope (Ex/Em = 340-380/385-470 nm). Acquire several images per well for analysis.

**Note:** Since Staining Dye photobleaches very rapidly, we recommend analyzing samples immediately.



**Figure: Liver cells (HepG2) cholesterol staining:** HepG2 cells were cultured overnight and next day treated with U-18666A (1.25 µM) or vehicle control (DMSO) for 48 hrs. (a) Cells treated with DMSO alone demonstrated majority of the cholesterol is localized in Plasma membrane. (b) Treatment with U-18666A for 48 hrs resulted in intracellular accumulation of cholesterol. (c) Higher magnification of image B. Images were taken using Nikon TiE microscope.



**VIII. RELATED PRODUCTS:**

Total Cholesterol and Cholesteryl Ester Colorimetric Assay Kit II (K623)  
Total Cholesterol and Cholesteryl Ester Colorimetric/Fluorometric Assay Kit (K603)  
HDL and LDL/VLDL Quantitation Colorimetric/Fluorometric Kit (K613)  
CETP Activity Fluorometric Assay Kit II (K595)  
CETP Inhibitor Screening Kit II (Fluorometric) (K594)  
PLTP Activity Fluorometric Assay Kit II (K593)  
VisionBlue™ Quick Cell Viability Fluorometric Assay Kit (K303)  
Cholesterol Efflux Assay (Cell based) (K582)  
Vinblastine Sulphate (1959)

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