NUCLEAR-ID® Red cell cycle kit (GFP-CERTIFIED®)

Convenient kit for studying cell cycle progression by various applications

Enzo Life Sciences' GFP-CERTIFIED® NUCLEAR-ID® Red Cell Cycle Analysis Kit provides a convenient approach for studying the induction and inhibition of cell cycle progression by flow cytometry. The kit is suitable for (1) determining the percentage of cells in a given sample that are in G_0/G_1, S and G_2/M phases, as well as to quantify cells in the sub-G_1 phase, and (2) DNA studies in live, permeabilized and fixed cells for normal cell lines and cell lines exhibiting multiple ploidy levels. A control cell cycle perturbation agent, Nocodazole, is provided for monitoring changes in cell cycle dynamics. Potential applications for live-cell studies are in the determination of cellular DNA content and cell cycle distribution for the detection of variations in growth patterns, for monitoring apoptosis, and for evaluating tumor cell behavior and suppressor gene mechanisms.

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Ordering Information

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ENZ-51008-100	1Kit

Manuals, SDS & CofA

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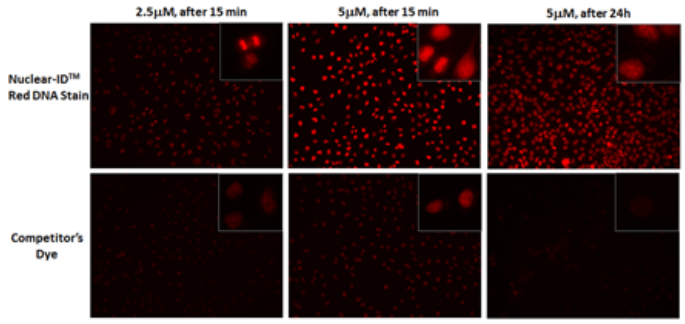
- Complete kit provides DNA content information in live, permeabilized or fixed cells
- Stable and high purity far-red fluorescent dye
- Performance validated using a wide range of cell densities.
- Does not require RNase treatment.
- Monitors changes in cell cycle dynamics arising from drug treatment or other perturbations
- UV laser source is not required for excitation.
- No photobleaching effect.
- True multiplexed capability with additional probes and dyes
- Stringently manufactured to control and eliminate non-specific assay artifacts
- GFP and FITC compatible.
- Easy to use!

Nuclear-ID® Red DNA Stain is more Economical than Competitor Dye

	Imaging # of Assays (A)	Cost of Assay	Nucleated Cell Gating # of Assays (B)	Cost of Assay	Live Cell Cycle Analysis # of Assays (C)	Cost of Assay
Nuclear-ID® Red DNA Stain	8,000	$0.036 Savings >75%	800	$0.368 Savings 55%	200	$1.48 Savings >50%
Competitor Dye	2,000	$0.163	400	$0.818	100	$3.27

Relative costs of using Nuclear ID® Red DNA in comparison to competitor dye in various applications: (A) Imaging (visualization), (B) Nucleated Cell Gating (flow cytometry) and (C) Live Cell Cycle analysis using flow cytometry. Dilutions can vary depending on cell strain and cell concentration.
Notes:
Assumes staining of a 100µl staining volume
Assumes staining of a 500µl cell suspension volume
Assumes a staining of 500µl cell suspension volume



NUCLEAR-ID® Red DNA Stain requires lower concentration than competitor's dye to visualize dsDNA. HeLa cells were grown to ~60% confluency. Cells were stained with NUCLEAR-ID® Red DNA Stain or a competitor's dye at a final concentration of 2.5 or 5µM for 15 min at 37°C and gently washed post-staining. Cells were imaged at 15 min and 24h. Results show that 2.5µM NUCLEAR-ID® Red DNA Stain was required for visualization of the dsDNA, while 5.0µM was required for the competitor's dye. At 24h, the competitor's dye intensity and cell growth were dramatically reduced at the 5µM final concentration. At the same time point, 5µM of NUCLEAR-ID® Red DNA Stain did not affect cell growth or fluorescent intensity. The NUCLEAR-ID® Red DNA Stain shows lower cytotoxicity and requires lower concentration in live cell studies, resulting in lower costs.

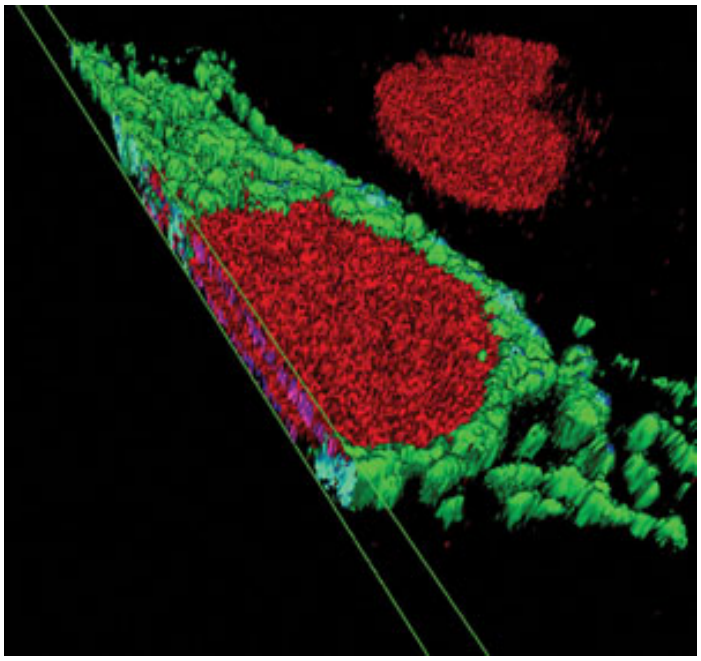


Figure 1: Three-dimensional reconstruction of the spatial relationship between the green fluorescent protein-expressing (GFP-expressing) mitochondria and the nucleus using a structured illumination method, as implemented with the ApoTome from Carl Zeiss, Inc. This imaging method enabled creation of optical sections through the nucleus using a conventional fluorescence microscope, for improved resolution along the optical axis. The optical sections were then used to create a 3-D reconstruction of the nucleus, enabling the GFP-expressing mitochondria to be displayed in their proper spatial context.

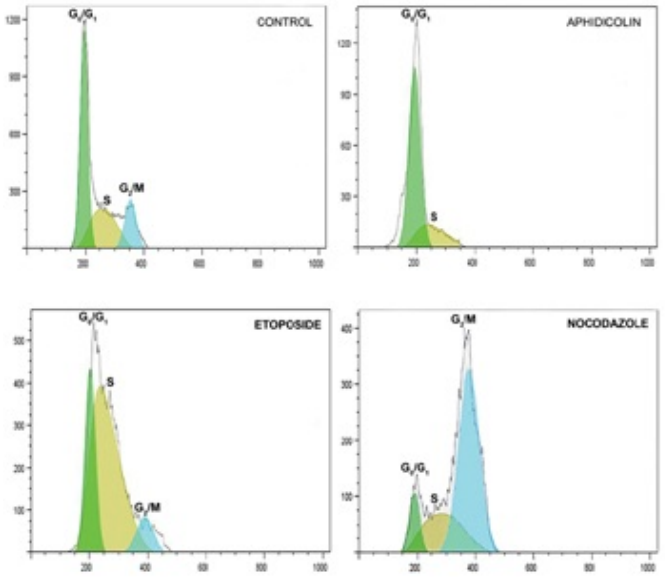


Figure 2: Live cells treated with different drugs show inhibition of cell cycle progression at different phases.

Handling & Storage

Use/Stability	With proper storage, the kit components are stable up to the date noted on the product label. Store kit at -20°C in a non-frost free freezer, or -80°C for longer term storage.
Handling	Protect from light. Avoid freeze/thaw cycles.
Short Term Storage	-20°C
Long Term Storage	-80°C
Shipping	Dry Ice

Regulatory Status

RUO - Research Use Only

Product Details

Application	Flow Cytometry, Fluorescence microscopy
Application Notes	Suitable for DNA studies in live, permeabilized and fixed cells for normal cell lines and cell lines exhibiting multiple ploidy levels.
Contents	NUCLEAR-ID® Red Cell Cycle Detection Reagent, 200 µL Nocodazole Control, 10 µL 10X Assay Buffer, 15 mL
Quality Control	1. Absorption peak of NUCLEAR-ID® Red dye: λ_{max} = 566 ± 4 nm 2. % purity of NUCLEAR-ID® Red dye by HPLC: ≥93% 3. A sample from each lot of GFP-CERTIFIED® NUCLEAR-ID® Red Cell Cycle Analysis Kit is used to analyze Jurkat cells using the procedures described in the user manual. Cells with Nocodazole gave $\%G_2$ value of >60%. Untreated cells gave the following results: (a) G_0/G_1 peak CV < 15%; (b) $\%G_1$ > 35%; (c) $\%G_2$ < 15%; and (d) G_2/G_1 ratio > 1.8.
Quantity	100 assays
Technical Info / Product Notes	The GFP-CERTIFIED® NUCLEAR-ID® Red Cell Cycle Analysis Kit is a member of the CELLESTIAL® product line, reagents and assay kits comprising fluorescent molecular probes that have been extensively benchmarked for live cell analysis applications. CELLESTIAL® reagents and kits are optimal for use in demanding imaging applications, such as confocal microscopy, flow cytometry and HCS, where consistency and reproducibility are required.

ENZO LIFE SCIENCES, INC.
Phone: 800.942.0430
info-usa@enzolifesciences.com

European Sales Office
ENZO LIFE SCIENCES (ELS) AG
Phone: +41 61 926 8989
info-eu@enzolifesciences.com

Belgium, The Netherlands & Luxembourg
Phone: +32 3 466 0420
info-be@enzolifesciences.com

France
Phone: +33 472 440 655
info-fr@enzolifesciences.com

Germany
Phone: +49 7621 5500 526
info-de@enzolifesciences.com

UK & Ireland
Phone (UK customers): 0845 601 1488
Phone: +44 1392 825900
info-uk@enzolifesciences.com