DRAQ7™ in Image-Based Screening

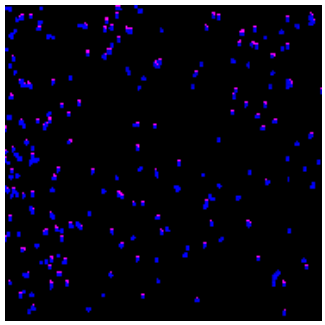
Far-Red Fluorescent Live-Cell Impermeant DNA Dye

biostatus

DR7.APPNOTE: IMAGE SCREEN 002 230323

1. DEAD/DAMAGED CELL IDENTIFICATION

BACKGROUND



In most cell-based assays for high content screening (HCS, target-based or phenotypic) fluorescence-based imaging is preferred. Several parameters can be studied simultaneously: a disease-related readout such as protein translocation can be combined with unrelated features that may reflect toxicity of the compounds (or siRNAs) being tested, whether desired (for example, with an anti-cancer agent) or not. In such live-cell end-point HCS assays it can help to estimate cell death as a measure of toxicity. In more sophisticated temporal- and dose-response assays a real-time measure of cell viability may be advantageous to gain a fuller understanding of cellular sensitivity to a compound. In principle, a simple means of achieving this would be the addition of fluorescent viability dye, typically a cell membrane-impermeant DNA probe that labels the nuclei of membrane-compromised cells.

WHAT IS THE PROBLEM?

A number of cell membrane-impermeant DNA dyes are candidates to report the presence of dead/damaged cells in HCS assays. In fluorescence-based assays it eases assay design if the viability dye is spectrally separated from most reagents likely to be used in HCS (allowing it to be chosen as a default component) and would include GFP, the spectrum of other fluorescent proteins available to tag biologically-relevant proteins and the cell permeant functional and organelle-specific probes. In this context, propidium iodide (PI) is not ideal due to its broad emission spectrum. Likewise, TOTO-3 and TOPRO-3 have orange/red emission that can occlude the valuable rhodamine-based dyes, depending on filter settings. Meanwhile, DAPI, needs equipment that is UV-enabled and due to spectral overlap with GFP and fluorescein-based probes would require duplicate scanning of samples.

Long-term or real-time monitoring has become of greater interest with the understanding of idiosyncratic toxicity. None of the viability dyes described above have been validated for long-term monitoring of cell health.

Typically these agents need to be prepared fresh from hard compound and cannot be stored long-term in a ready-to-use aqueous format, and are prone to photobleaching.

HOW DOES DRAQ7™ HELP?

As a far-red DNA-binding viability probe DRAQ7™ immediately avoids spectral overlap with visible-range and UV-excited probes allowing it to be used as a default viability probe. It has been validated for long-term, real-time use and exhibits extremely low photobleaching. DRAQ7™ only enters cell with compromised membranes and, due to its high dsDNA specificity, reports the nuclear texture of dead and dying cells.

DRAQ7™ consolidates observation of treatment effect (e.g. protein translocation) and toxicity measurement, cell-by-cell, without duplicating cell culture and reagent costs to run a separate homogeneous ATP-based method.

DRAQ7™ is stored in a ready-to-use aqueous format with a very long shelf-life.

DRAQ7™ Product Features:

- far-red fluorescing cell impermeant dsDNA probe
- rapid, clear labelling of only the permeabilized cells
- compatible with UV-/violet-excited, fluorescein and rhodamine dyes
- unifies observation of target biology and toxicity
- DMSO-free; long-term assay compatible

For a full price list and further information see **www.biostatus.com** or contact us at:
BioStatus Limited
56a Charnwood Road, Shepshed, Leicestershire LE12 9NP United Kingdom
T +44 1509 558 163 | **F** +44 1509 651 061 | **E** enquiry@biostatus.com | **W** www.biostatus.com