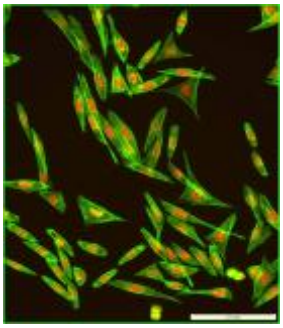
DRAQ9™ in Long-Term Cell Tracking

Far-Red Fluorescent Live-Cell Cytoplasmic Dye

DR9.APPNOTE: TRACKING 001 070617

1. LONGITUDINAL CELL-BASED ASSAYS

BACKGROUND



Imaging technologies and cell culture techniques have advanced to the extent that we are getting close to recapitulating normal and disease biology *in vitro* enabling 2-D and 3-D models and complex systems with, for example, tumour, stromal and immune cells. As a next step these can now be challenged with a new parameter of time to better reflect physiological conditions and realistic therapeutic doses of potential treatments. With the addition of time as a parameter cells then potentially may be tracked for a change in behaviour such as invasiveness, motility, proliferative capacity, or basic individual cellular morphology. In the case of transduced cells it may be possible to aid this with a constitutively expressed fluorescence reporter or a small molecule probe that can label a cellular compartment or structure.

WHAT IS THE PROBLEM?

To maintain the best surrogacy for *in vivo* behaviour it would be preferable to use cells with the least perturbance. Hence, for example, GFP tagged cells may have a different phenotype to the native cells and may not reflect their behaviour under treatment or other stimuli, rendering this tracking option less preferable. (However, it should be added that such transformed cell lines are still useful in this context.) One early option attempted was the use of cell-permeant DNA probes. Their binding target almost immediately invalidates their use as cells either experience rapid changes at the chromatin level or expend ATP in trying to clear these molecules. Alternately, the "dilution" dyes which give information on proliferation such as CFSE and its analogues (which work by chemically combining with cytoplasmic proteins) are of limited use as the signal will vary significantly from cell to cell. Photo-bleaching and chemical instability are all potential issues in longitudinal time-lapse experiments along with the risk of UV-induced DNA damage which therefore excludes the use of UV-excited probes. When a probe meets criteria required it should also have spectral properties that permit combination with other organelle- or target- specific fluorescent probes, most importantly for detailed end-point determinations.

HOW DOES DRAQ9™ HELP?

DRAQ9™ is compatible with time-lapse experiments to follow cells over several days due to its cell permeance, ultra-low toxicity and cytoplasmic labeling. Further, DRAQ9™ cells can be fixed to capture information and combine with other end-point analyses. The far-red cell permeant cytoplasmic probe DRAQ9™ rapidly and stably enters live cells to label structures around the cell nucleus. DRAQ9™ can be retained in the culture medium to maintain the staining. DRAQ9's red excitation limits the risk of DNA damage and its far-red emission ensures that it is widely compatible with visible-range chromophores such as CFP, GFP and RFP. DRAQ9 is not photo-bleached or chemically unstable in culture media.

DRAQ9™ Product Features:

- far-red fluorescing cell permeant cytoplasmic probe
- non-toxic to cells over several days continuous exposure
- optimally excited by red laser lines, no DNA UV-exposure
- compatible with UV-excited and visible range chromophores
- water-soluble; ready-to-use from the fridge

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