U2OS Cell Cycle Chromobody®

ChromoTek’s powerful U2OS Cell Cycle Chromobody® (U2OS CCC) is a stable cell line expressing our cell cycle marker “ready to go” for cellular screening. It enables you to screen for compounds such as cancer drugs for effects on the cell cycle and toxicity in one experiment. You can apply this High-Content Assay in early drug development and validation as well as in basic research. The U2OS CCC cell line is compatible with automated or traditional confocal and epifluorescence microscopes.

Simultaneous read out of:
- cell size and morphology
- nuclear morphology
- progression of S phase
- mitosis

U2OS Cell Cycle Chromobody® features at a glance:
- Stable U2OS cell line expressing Cell Cycle Chromobody® ready to go for cellular screening
- Trace dynamic changes during the cell cycle in real time
- Monitor the distribution of an endogenous cell cycle marker protein – in comparison to fluorescent fusion proteins no overexpression artifacts or cytotoxic effects
- No effect on function of the cell

Chromobody®-Technology

To directly visualize dynamic cellular processes in real time ChromoTek has developed Chromobodies®. Chromobodies® are a novel species of intracellular functional antibodies. Chromobodies® are based on the antigen binding domain (V<sub>H</sub>) derived from heavy chain antibodies of camelids genetically fused to TagGFP2 or TagRFP (from Evrogen).

Assay Examples

The U2OS CCC cell line enables you to perform dynamic, non-invasive, multi-parameter assays with just one fluorescent channel. This gives you the full flexibility to multiplex it with other procedures including antibody stainings.

The challenge

The understanding of cellular processes in response to external stimuli is one of the major challenges in early drug discovery, compound screening and validation. Antibodies are the key reagents for visualizing cellular components but their use is restricted to fixed cells. Furthermore, the use of antibodies is often hindered by batch-to-batch variations and laborious multi-step staining protocols.

To study protein localization and dynamics you may use live cell imaging with fluorescent fusion proteins. The main drawback of this approach is, however, that one can only visualize artificially introduced chimeric proteins. The endogenous proteins, their posttranslational modifications as well as non-protein components remain invisible.

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Tag: Chromobody® signal during the cell cycle. Confocal images were captured using the Opera High Content Screening System. To illustrate how the Chromobody® binding signal changes over time, only a subsection of images are shown. The Chromobody® signal starts as a homogeneous distribution through the nucleus and cytoplasm. Over time the nucleus begins to appear granular and forms spots, finally the granularity disappears and the cell divides. Below: The texture parameters were used to measure the Cell Cycle Chromobody® signal in the nucleus (blue). Measurement of the cytoplasmic area was used to identify cells rounding up and entering mitosis (red).

Trichostatin A (TSA): a compound that selectively inhibits the class I and II mammalian histone deacetylase (HDACs). TSA inhibits the eukaryotic cell cycle during mid/late S phase.


Aphidicolin: a reversible inhibitor of eukaryotic nuclear DNA replication (specific inhibitor of DNA polymerase A,D). Blocks the cell cycle at early S phase.