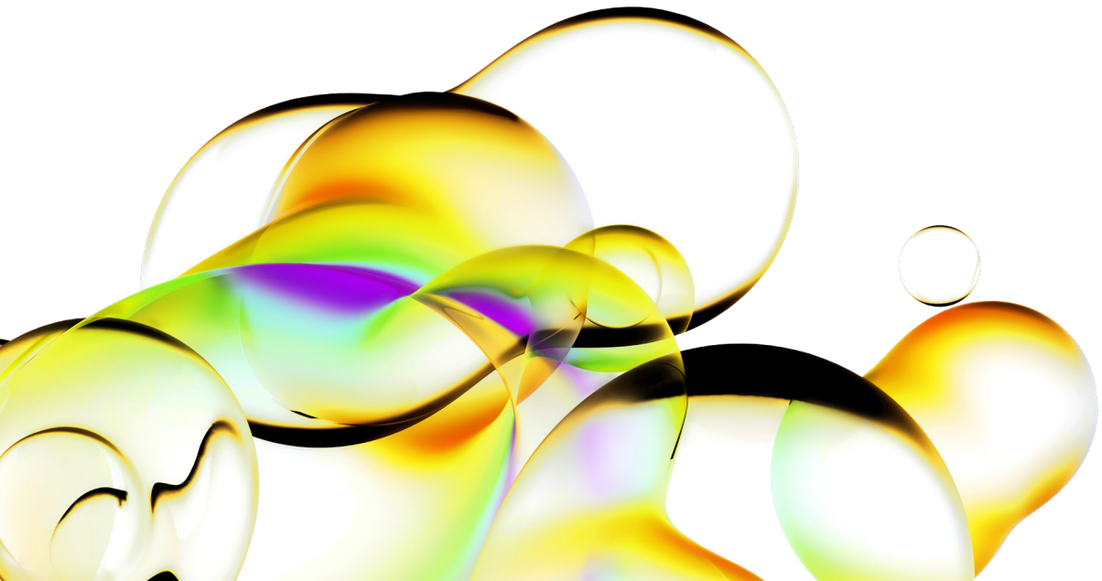
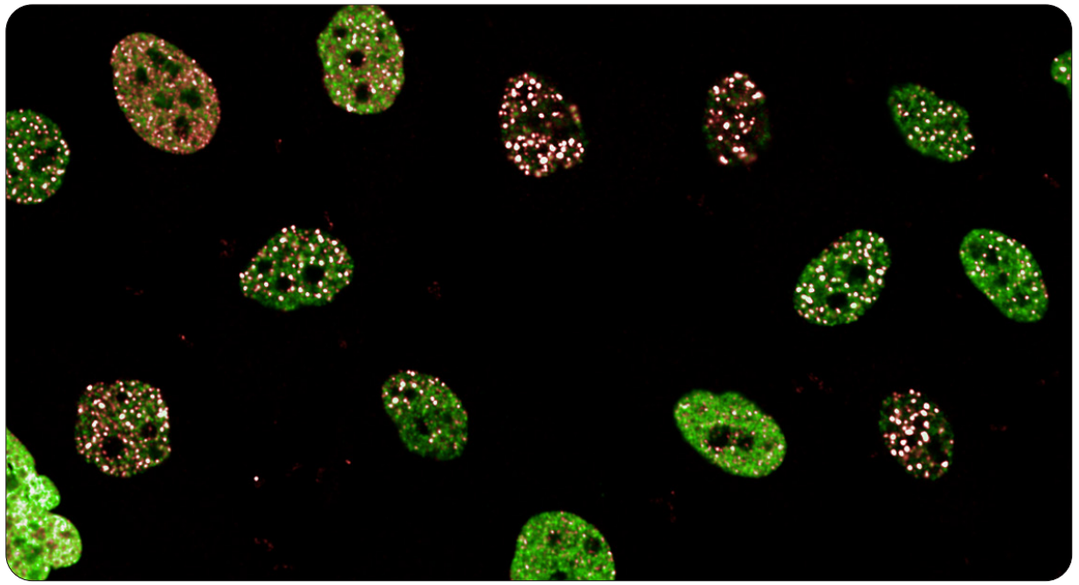
# Visualize key markers of DNA damage and repair.



## PhenoVue DNA damage response staining kit

DNA damage triggers a complex cellular response essential to maintaining genome integrity. The PhenoVue™ DNA damage response (DDR) staining kit provides fluorescent detection of two key DDR biomarkers - γ-H2AX and 53BP1 - enabling multiplex imaging of DNA double-strand break repair dynamics.



**Kit features:**

- **Dual-target detection:** anti-γ-H2AX and anti-53BP1 antibodies with matched secondary antibodies.
- **High specificity:** validated on human cell lines with strong signal-to-noise and minimal background.
- **Multiplex-ready:** compatible with PhenoVue™ Fluor 555 or 400LS for additional marker detection.
- **Streamlined workflow:** ready-to-use kit for high-content imaging in 384-well or 96-well plate formats.

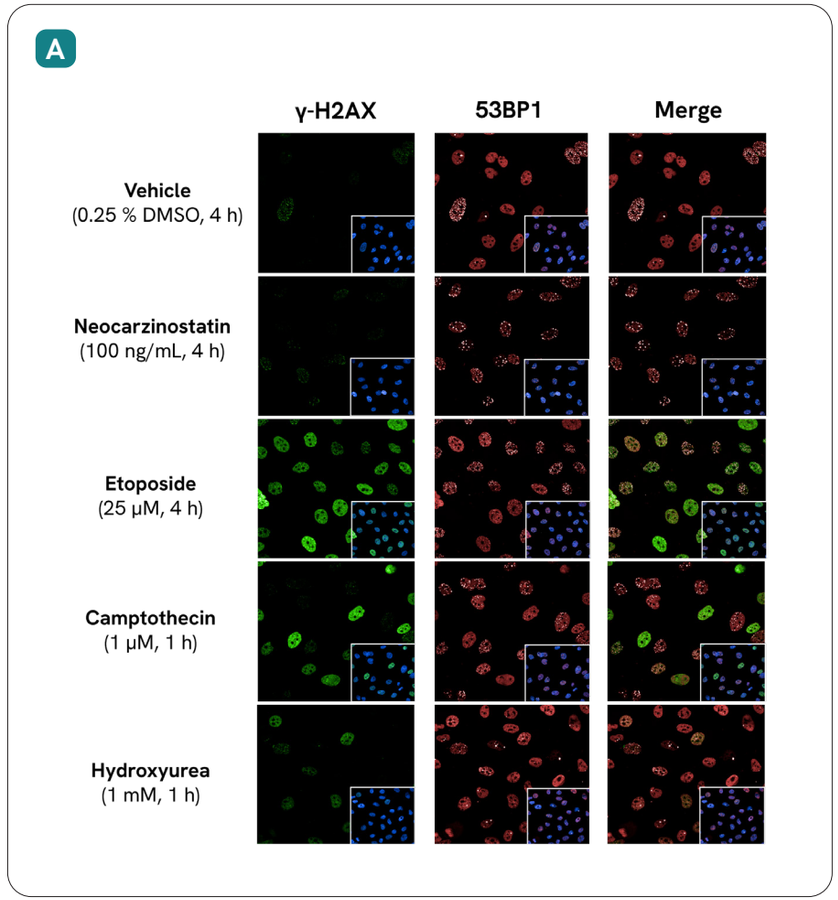
**Applications:**

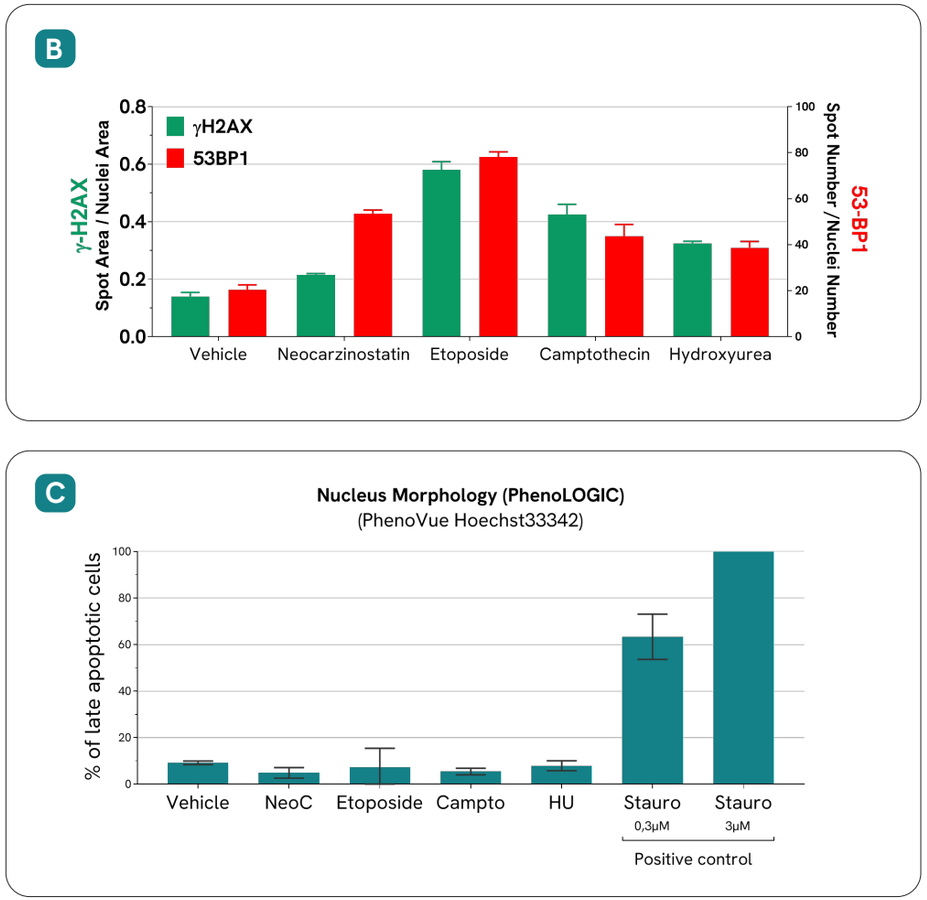
- **Cancer research:** identify and quantify DNA damage foci, assess DDR activation post-drug treatment.
- **Drug discovery & screening:** evaluate genotoxicity and efficacy of DNA-damaging agents or DDR inhibitors.
- **Genomic stability studies:** explore mechanisms underlying DNA repair, apoptosis, or chromatin remodeling.
- **Toxicology:** detect DNA damage from environmental or chemical stressors.

# Deciphering DNA damage response profiles

High-content imaging of HeLa cells treated with various compounds reveals distinct DDR signatures:

- **γ-H2AX phosphorylation** varies by compound, showing nuclear foci or diffuse staining.
- **53BP1 relocalizes** from diffuse distribution to foci co-localized with γ-H2AX.
- **Nuclear morphology changes** indicative of apoptosis were quantified using PhenoLOGIC™ image analysis software.







*HeLa cells seeded in PhenoPlate 96-well microplates at 10,000 cells/well. Incubated overnight at 37 °C with 5% $CO_2$. Cells then treated with compounds as shown, followed by fixation, permeabilization, blocking, then staining using the PhenoVue DNA damage response staining kit. Imaged with the Opera Phenix Plus high-content imaging system (63x water immersion objective, confocal mode). Different compounds triggered distinct DNA damage response profiles.* ***A and B:*** *Phosphorylation of H2AX (S139) increased to varying degrees, leading to either discrete nuclear foci (e.g., neocarzinostatin), diffuse nuclear staining, or a combination of both (e.g., etoposide, camptothecin, hydroxyurea). 53BP1 relocalization was observed, shifting from a diffuse nucleoplasmic distribution to foci that largely colocalized with γH2AX at DNA damage sites.*
***C:*** *Nuclear morphology changes, assessed using the PhenoVue Hoechst 33342 channel, were analyzed with PhenoLOGIC™ (in Harmony™ or Signals Image Artist™) to quantify late apoptotic cells characterized by nuclear shrinkage and/or DNA fragmentation.*

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