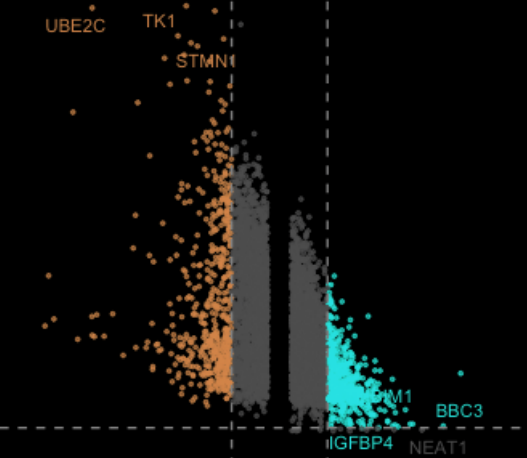


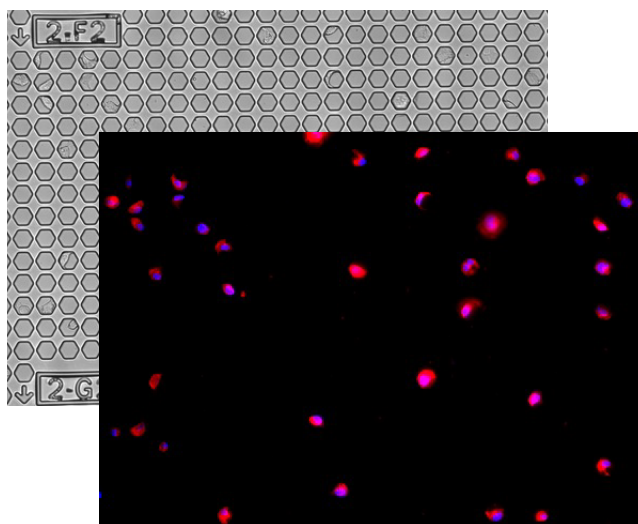


Integrating live-cell imaging and RNA-seq to resolve drug response heterogeneity in adherent cells

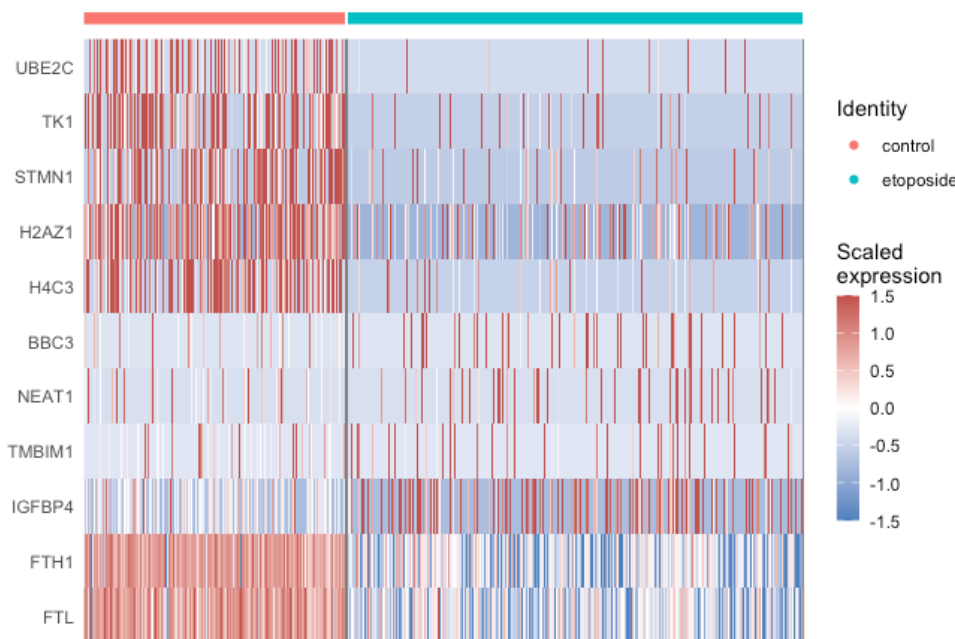
Capturing transcriptional drug responses in adherent cancer cells while preserving phenotypic context remains challenging. Here, we demonstrate an integrated live-cell imaging and single-cell RNA sequencing workflow applied to adherent A549 lung cancer cells treated with etoposide, resolving heterogeneous DNA damage responses at single-cell resolution.

Experimental Setup

- A549 lung carcinoma cells (adherent)
- Etoposide 10 μ M vs DMSO control
- Cells cultured and treated on FLEX chip
- Live-cell brightfield imaging + nuclear stain + WGA membrane stain
- Whole-transcriptome single-cell RNA-seq



Live-cell imaging of adherent A549 cells on the FLEX chip
Representative brightfield and fluorescence images showing nuclear and membrane staining of A549 cells following on-chip culture and etoposide treatment.



Transcriptional response of A549 cells to etoposide at single-cell resolution.
Log-normalized expression of selected genes across single A549 cells treated with etoposide or control, highlighting heterogeneous DNA damage responses.

Key Results

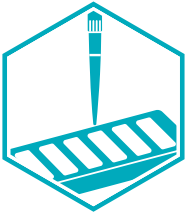
- Single-cell transcriptional responses resolved in adherent cells
- Clear drug-induced gene expression changes at single-cell resolution
- Compatible with standard adherent cell culture workflows

What this demonstrates:

This experiment demonstrates integrated live-cell imaging and single-cell RNA sequencing of adherent cancer cells following drug perturbation. The workflow captures heterogeneous transcriptional responses to etoposide while maintaining compatibility with standard adherent cell culture and imaging workflows.



Flexomics single-cell imaging + sequencing workflow



1- LOAD

- Each easy-to-use FLEX chip consumable contains a high-density array of mapped picowells
- No custom equipment required
- Two slide formats are available
 - Eight sites partitioned for concurrent analysis of multiple samples
 - Single site for large-scale analysis of a single sample



2- CULTURE

- Culture cells in standard labware OR directly on the FLEX consumable
- Cells cultured on the FLEX consumable maintain high viability for 4+ days



3- BRING YOUR OWN ASSAY (BYOA)

- Hassle-free customization of molecular and cellular workflows
- The FLEX chip supports many types of miniaturized functional assays, including:
 - Cell-cell interaction, neoantigen discovery, immunofluorescence, cytokine signaling, proliferation/survival assays, and more



4- IMAGE

- The FLEX chip is compatible with conventional inverted fluorescence microscopes
- Enables live cell image capture across multiple timepoints



5- SEQUENCE

- Each FLEX chip is combined with optically-encoded RNA capture beads for easy cell labeling and tracking
- FLEX single cell barcoding is compatible with short-read and long-read sequencing platforms
- Choose from whole transcriptome or custom targeted RNA-sequencing panels



6- ANALYSIS

- Free access to the FLXplorer analysis platform is included with each consumable purchase
- Easily view, filter, plot, and export correlated imaging and sequencing data directly from the FLXplorer platform
- Analysis-ready outputs compatible with standard single-cell analysis tools

