Evaluating Feature Extraction in Ovarian Cancer Cell Line Co-Cultures Using Deep Neural Networks

This dataset contains images obtained from drug treatment of five different co-cultures of ovarian cancer and fibroblast cell lines. The co-cultures were seeded in 384-well plates and treated with 528 drugs at 5 different concentrations before immunofluorescence staining for each cell type. Images were acquired using Opera Phenix for each well in 4 channels (3 fluorescent and 1 brightfield) and 4 fields of view per channel. In total this image dataset consists of 245 760 raw images. See this for analysis.

Coculture Combinations

Cancer cell line	Fibroblasts cell line	Abbreviation
Kuramochi	BjhTERT	KB
Kuramochi	WI38	KW
MH	BjhTERT	MHB
OvCar3	BjhTERT	O3B
OvCar8	WI38	O8W

Directory Structure

Each coculture combination assay is organized into a folder. Within each folder, there are subfolders each corresponding to a 384 well plate.

Example:

Kuramochi_BjhTERT/
  20200703_N1A82__2020-07-03T14_57_44-Measurement 1/
    Images/
      r01c01f01p01-ch1sk1fk1fl1.tiff
      r01c01f02p01-ch1sk1fk1fl1.tiff
      ...
  20200703_N2A82__2020-07-03T14_57_44-Measurement 2/
    Images/
      ...
Kuramochi_WI38/
  20210318_N1Set25__2021-03-18T11_28_37-Measurement 1/
    Images/
      ...

Plate Naming Convention

Each plate folder follows a naming convention:

Example: `20200703_N1A82__2020-07-03T14_57_44-Measurement 1`

- `20200703`: Date of image acquisition (YYYYMMDD)
- `N1`: Plate number in the FIMM Oncology Drug Set
- `A82`: Set identifier (same for all plates in the coculture combination)
- `2020-07-03`: Date (repeated for clarity)
- `T14_57_44`: Time of acquisition (HH_MM_SS)
- `Measurement 1`: Indicates the images were acquired once

Image Naming Convention

Images within each plate folder are stored in an `Images` subfolder. Each image file name follows this format:

Example: `r01c01f01p01-ch1sk1fk1fl1.tiff`
  - `r01c01`: Row 1, Column 1 (well position on plate)
  - `f01p01`: Field of view 1, plane 1
  - `ch1sk1fk1fl1`: Channel information
    - `ch1`: Channel 1 (Vimentin - fibroblasts)
    - `ch2`: Channel 2 (CK8/18 - cancer)
    - `ch3`: Channel 3 (Brightfield)
    - `ch4`: Channel 4 (Hoechst - nuclei)

Example for Multiple Fields of View in One Well:
- `r01c01f01p01-ch1sk1fk1fl1.tiff`
- `r01c01f02p01-ch1sk1fk1fl1.tiff`
- `r01c01f03p01-ch1sk1fk1fl1.tiff`
- `r01c01f04p01-ch1sk1fk1fl1.tiff`

Channel Differences for MH_BjhTERT Combination

Note: For the MH_BjhTERT combination, the channel order is different:
- `ch1`: Vimentin
- `ch2`: Hoechst (nuclei)
- `ch3`: CK8/18 (cancer)

Image Details

Resolution: Images were acquired at 10x resolution with pixel size 2048x2048.
Total Images per Plate: Each plate has 6144 images.
Channels per Well: 4 (Vimentin, CK8/18, Brightfield, Hoechst)
Fields of View per Well: 4

Summary

This dataset provides detailed imaging data from various co-culture assays of ovarian cancer and fibroblast cell lines, treated with a wide range of drugs. The structured organization and comprehensive naming conventions allow for easy navigation and analysis of the data. The images can be used to study drug responses and interactions between cancer and fibroblast cells.