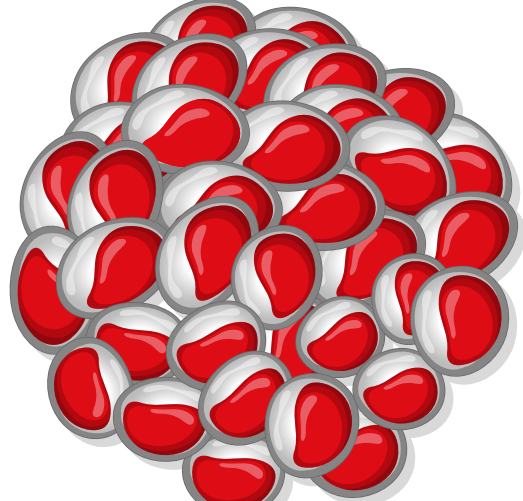
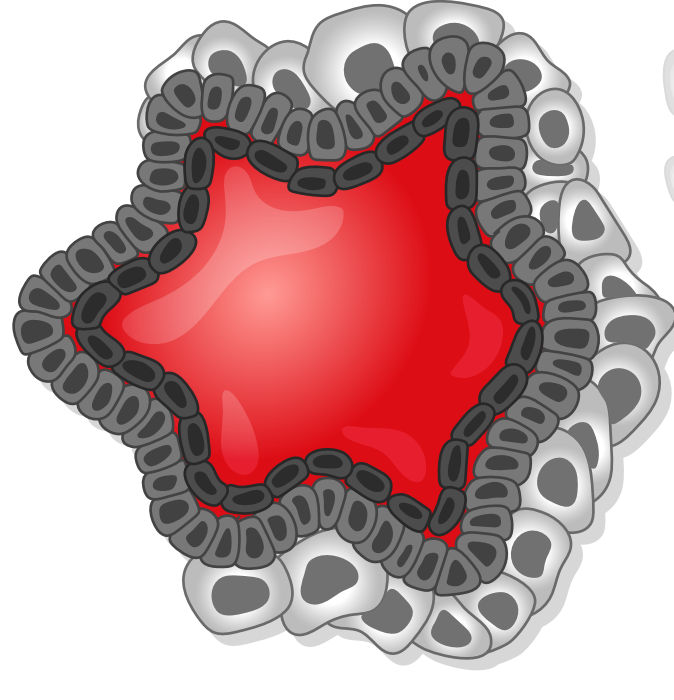


GROWING CANCER ORGANOIDS

Cancer organoids or tumorspheres?

Cancer organoids are 3D cell cultures that can be developed from cancer stem cells, or from the genetic modification of non-cancerous organoids, to mimic a wide range of different cancers and tumor types. They play a vital role in the investigation of cancer biology, drug design, and diagnostics. During their genesis, the founding stem cells can be stimulated with signal and growth factors to differentiate and self assemble into structures that contain a cellular composition and arrangement that is representative of a corresponding organ, tissue or tumor.

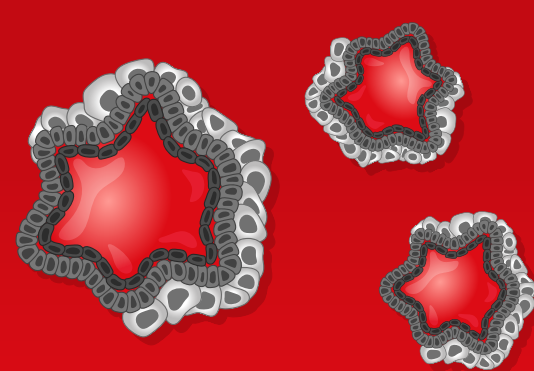
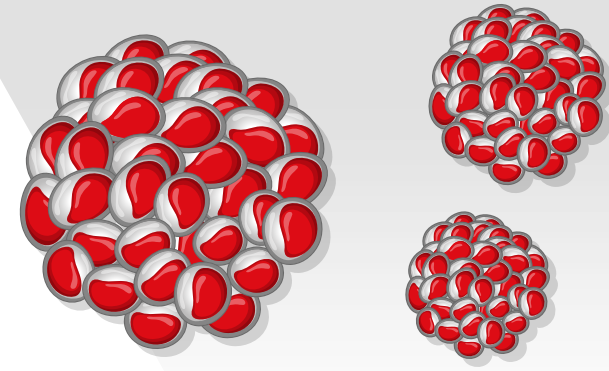


Besides cancer organoids, tumorspheres provide an alternative 3D model for cancer-cell cultivation. Tumorspheres are 3D cell aggregates initiated by cancer stem cells. They can be developed from commercially available cancer cell lines or primary cancer cells.

Each model has its own advantages and limitations. Find out which model works best for your approach below.

TUMORSPHERES

ORGANOIDS



Differences

- Most commonly used 3D model for cancer research
- Easy and cost-efficient setup
- Typically created in a matrix-free environment
- Long-term culturing over several passages possible
- Usually composed of one cell type
- Can be cultured in a homogenous and standardized way
- Enable enrichment of cancer stem cells
- In vitro* model for metastasis

- More advanced and *in vivo*-like model which exhibits self-organizing structures
- Usually more complex setup
- Require extracellular matrix
- Long-term culture possible depending on the cell type
- Composed of different cell types - enable *ex vivo* assays with both cancer cells and cells of the tumor microenvironment
- Less uniform and, therefore, more difficult to standardize
- Normal cells can easily overgrow cancer cells; therefore, the composition of the cells must be carefully considered
- Allow more complex studies on cell-cell interactions and enables studies on invasive behavior of the cancer cells

Commonalities

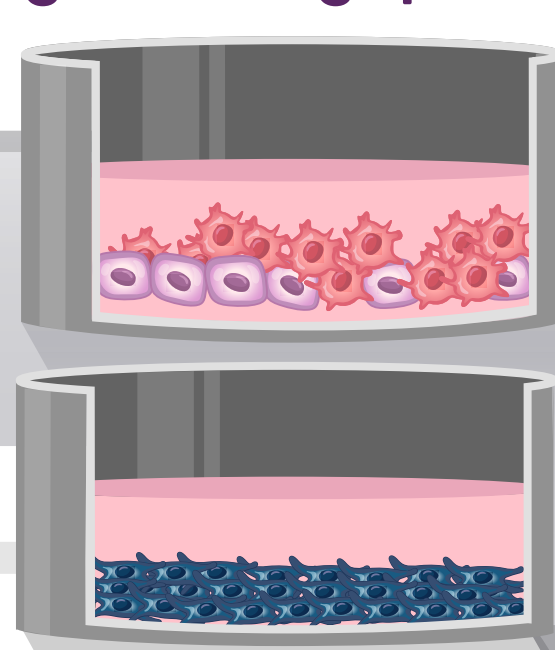
- Reproducible and scalable
- High-throughput screening capability
- Can be developed from a wide range of commercially available cancer cell lines or primary cancer cells from tumor biopsies

Workflow:

Setting up a robust and high-throughput cancer organoid assay

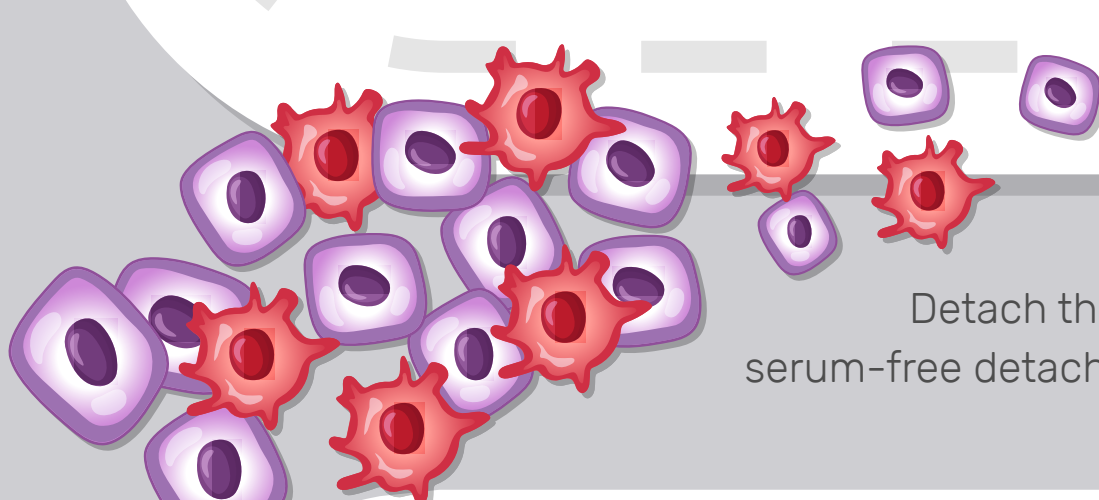
1.

Expand cancer and non-cancer cells in a 2D environment using a suitable medium, e.g., PromoCell's serum- and xeno-free Cancer Cell Line Medium XF



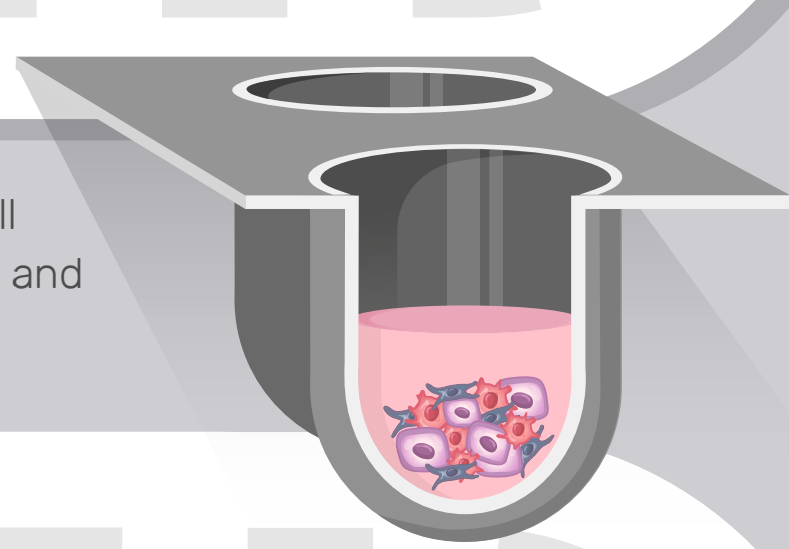
2.

Detach the cells using a serum-free detachment method



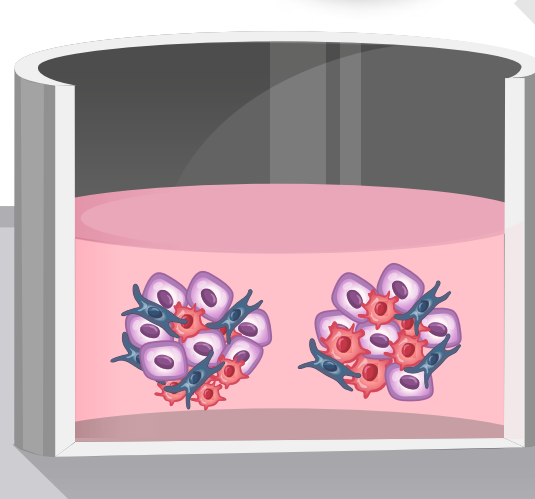
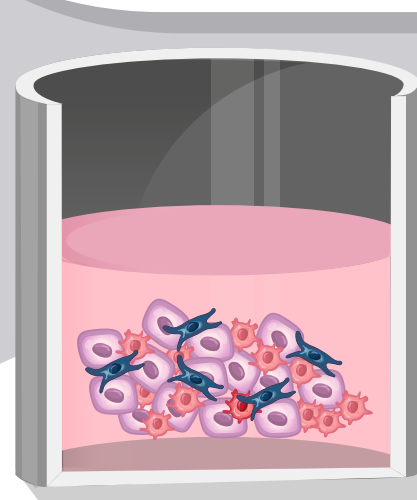
3.

Pool the cells in a 96-well suspension culture plate and let organoids aggregate



4.

Mix organoids with collagen suspension and let the collagen gel polymerize



5.

Incubate the organoids until they show the characteristic self-organization

Key advantages of PromoCell's organoid model

- PromoCell Cancer Cell Line Medium XF allows and supports the presence of cancer and non-cancer cell types together in one culture system
- Their environment supports cancer stem cells as the critical driver of tumor formation and metastasis
- The media can be combined with attachment matrices, i.e. collagen, to build an extracellular matrix
- PromoCell cancer toolbox media can be used in a wide range of assays from drug discovery to complex 3D models such as bioprinting