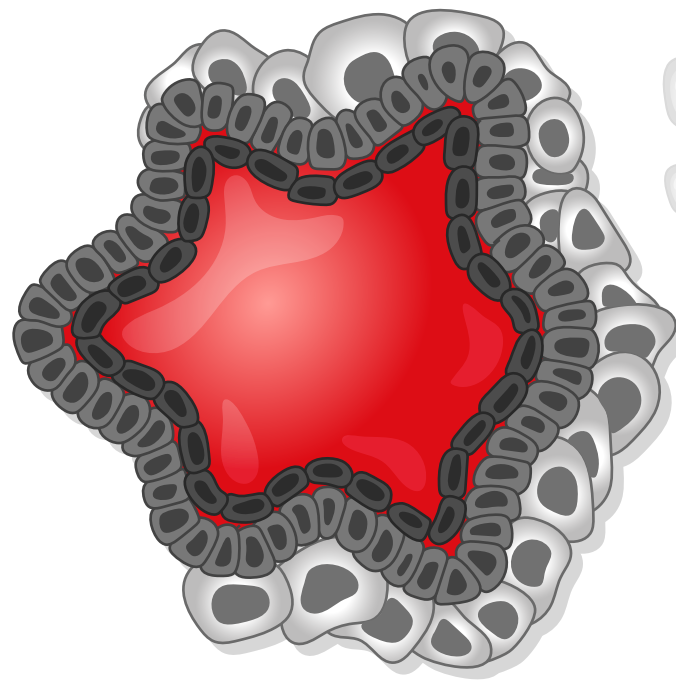


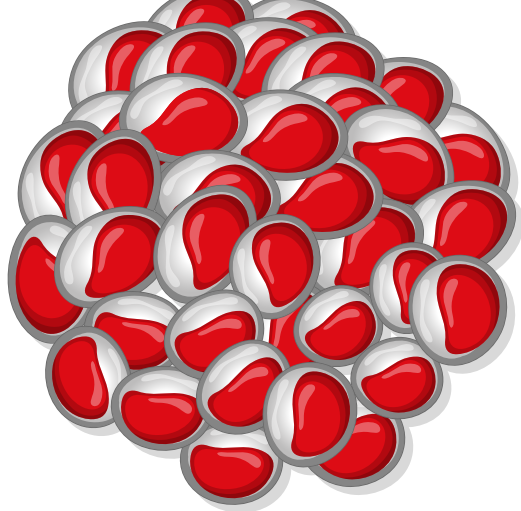
GROWING CANCER ORGANOIDS

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.

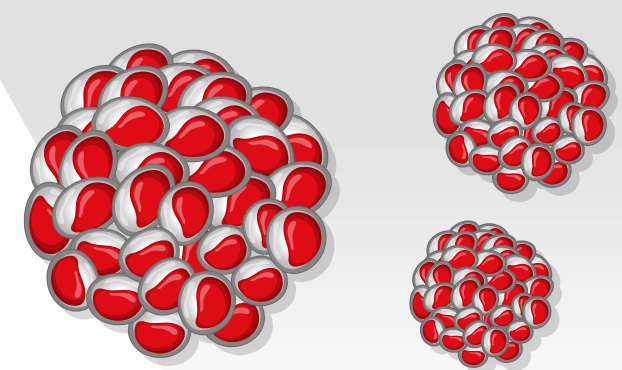


Besides cancer organoids, tumorspheres provide an alternative 3D model for cancer-cell cultivation. Tumorspheres are 3D cell aggregates initiated by cancer stem cells. They can be developed from commercially available cancer cell lines or primary cancer cells.



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

TUMORSPHERES



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

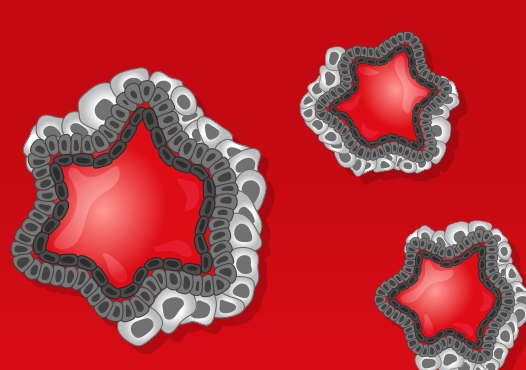
Usually composed of one cell type

Can be cultured in a homogenous and standardized way

Enable enrichment of cancer stem cells

In vitro model for metastasis

ORGANOIDS



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

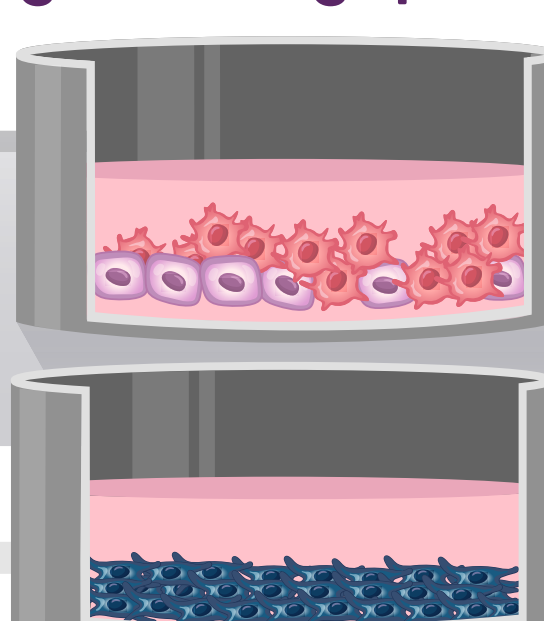
Can be developed from a wide range of commercially available cancer cell lines or primary cancer cells from tumor biopsies

Workflow:

Setting up a robust and high-throughput cancer organoid assay

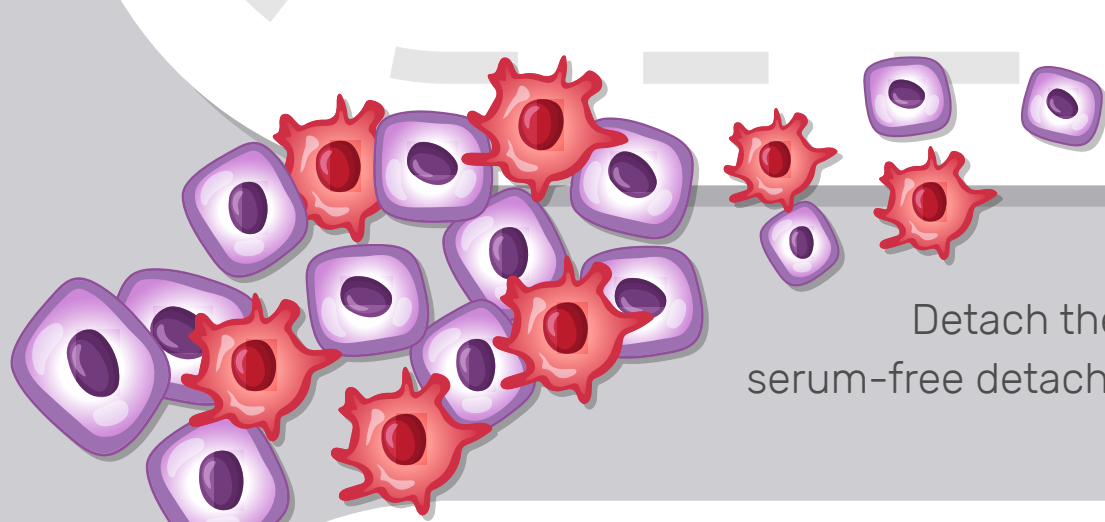
1.

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



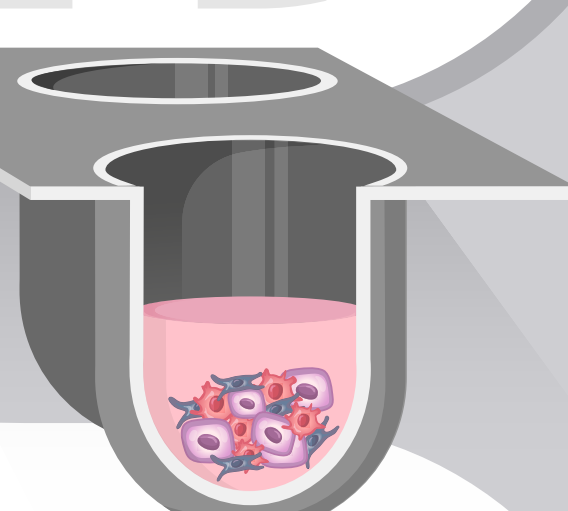
2.

Detach the cells using a serum-free detachment method



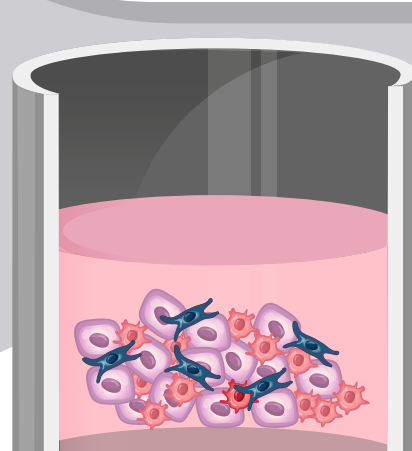
3.

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



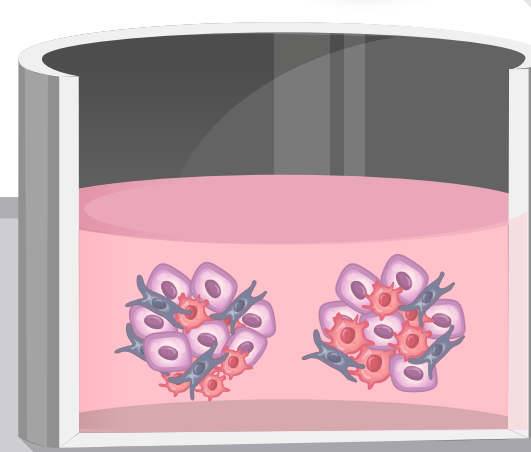
4.

Mix organoids with collagen suspension and let the collagen gel polymerize

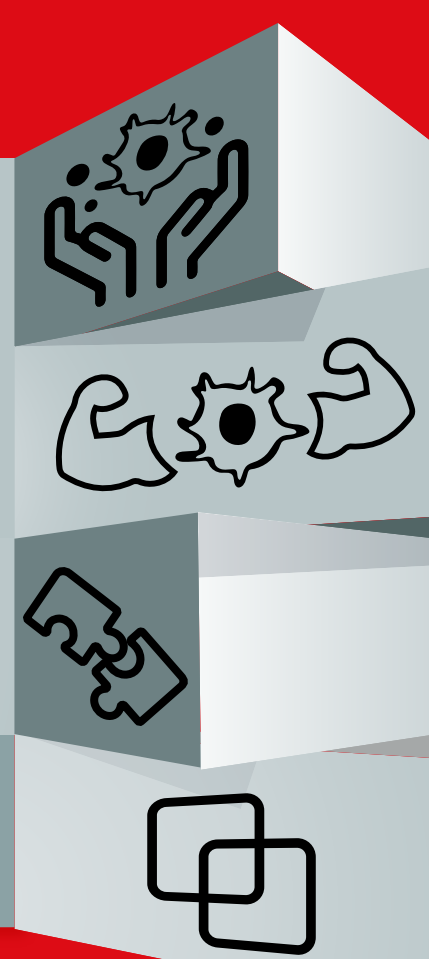


5.

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