

# Scalable and automated 3D cell cultures for high-throughput and high-content screening

IN DRUG DEVELOPMENT, high-throughput screening (HTS) is a commonly used method where the objective is to identify lead compounds with biological activity. Many cell-based HTS and high-content screening (HCS) assays are still carried out using traditional two-dimensional (2D) cultures. However, the highly artificial HTS monolayer 2D cultures are thought to significantly impact the predictive value of compound screens, leading to high failure rates in drug discovery. Advanced, but simple-to-use three-dimensional (3D) cell-based assays for HTS and HCS could work as a solution to provide more physiologically-relevant cell culture models.

Animal-derived matrices present many challenges when used in HTS or HCS. Due to their origin, collagen and hydrogels derived from extracts of Engelbreth Holm-Swarm mouse tumours are complex scaffolds that contain many components, including ones that are unknown or vary based on the production lot. While these animal-based materials support the interaction of cells with extracellular matrix (ECM) proteins, due to their different composition, cells embedded into the gels can display different phenotypes.

From a technical perspective, animal-derived gels require heavy optimisation to make them compatible with HTS and HCS workflows. The user must ensure that the animal-derived hydrogel remains in liquid state during dispensing with sufficient temperature control. The need for handling animal-derived hydrogels at low temperatures makes them unsuitable for common liquid handling equipment used during HTS. The material properties of animal-derived hydrogels make setting up HTS assays technically complicated, labour intensive and expensive compared to other available solutions.

GrowDex is an animal-free, easy-to-use hydrogel that mimics the ECM and supports cell growth and differentiation with consistent results. GrowDex hydrogels are the proven solution for HTS and HCS 3D cell-based assays.

These hydrogels have the advantage of providing defined and tuneable material



properties that allow the controlled inclusion of biochemical cues. GrowDex is produced from wood-derived nanofibrillar cellulose (NFC) and water. It does not include any traces of animal DNA or RNA. Manufacturing is done according to ISO 13485.

The material properties of GrowDex enable free diffusion of small and large molecules through the matrix, making it possible to run large screens without interference. The hydrogels are shear-thinning and ready-to-use, as they do not require covalent crosslinking reactions to form the gel.

GrowDex enables reproducible dispensing and scaling up from 96- and 384- to 1,536-well plate formats. The hydrogels can also be pre-diluted and dispensed in room temperature conditions, saving time when preparing new assays.

GrowDex hydrogels are the proven solution for HTS and HCS assays for spheroids and organoids:

- Establish automated 3D HTS and HCS assays with high precision and speed at room temperature in 96-, 384- and 1,536-well formats

- No more worrying about temperature control, clogging pipette tips or unexpected polymerisation of the matrix
- Avoid challenging optimisation steps and focus on analysing your cells. End-point analysis is robust and accurate as the matrices are not auto-fluorescent.
- GrowDex hydrogels have been used to culture stem cells, patient-derived cells, primary cells, co-cultures, biopsies and cell lines with more than 180 protocols available. 📄

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Learn more at:

[www.growdex.com/hts](http://www.growdex.com/hts)

# GrowDex<sup>®</sup> hydrogels for 3D cell culture

Next generation solution for reproducible and scalable 3D cell culture applications providing convenience and consistent results.



## Animal free\*

Clean and well-defined hydrogels consisting of only nanofibrillar cellulose and purified water. No animal DNA interfering with readouts.

\*excludes GrowDex-A after addition of biotinylated ligands



## Reproducible lots

Do not add variation to your results. Our GrowDex hydrogels are manufactured to the highest standards with strict quality control criteria, so you can be sure the performance will be the same regardless of the production batch ordered.



## Ready to use

No gel preparation steps required. GrowDex hydrogels are provided ready to use, and they can be used and stored at room temperature. Just mix the hydrogel with your media and cells, dispense and incubate.



## Temperature stable

Easy and fast handling. Store and work at room temperature, no need to work on ice or at elevated temperatures.