PURDUE INNOVATES | Office of Technology Commercialization

Deterministic Culturing of Single Cells in 3D

A novel method generates highly controlled, nanoscale carbohydrate patterns on hydrogel surfaces for advanced drug screening, cell interaction studies, and medical diagnostics.

Researcher at Purdue University have developed a new material and method for deterministic culturing of single cells in 3D. There is a growing need to create in vitro representations of cells for tissue research, such as for cancer detection. Purdue researchers meet this challenge by isolating and extracting single cells in cell cultures and seeding them into unique matrix gel islands tailored to their specific physiological conditions. In testing in vitro with breast cancer cells, researchers observed that intratumor heterogeneity increased over time and found a positive relationship between the size and heterogeneity of the nuclei of tumor cells and how quickly tumors grow. This technique can be implemented in a variety of biomedical applications including personalized medicine, drug discovery, and tumor management.

Advantages:

-Cell Isolation

-Enhanced Seeding

Potential Applications:

-Tumor Management

-Drug Discovery

-Personalized Medicine

Technology Validation:

Cancer cells including those of breast and colon cancers have been tested using the new apparatus and approach and once isolated patterns in tumor growth could be analyzed.

Recent Publication:

Technology ID

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Category

Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics

Biotechnology & Life Sciences/Cell & Gene Therapy Platforms

Materials Science & Nanotechnology/Biomedical & Bioinspired Materials

Pharmaceuticals/Research Tools & Assays

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