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High-Throughput Magnetic Actuation Platform for Cancer Treatment Screening

Multi-well platform that applies biomimetic mechanical strain to 3D cell cultures for faster, more accurate therapy screening.

Researchers at Purdue University have developed a biomimetic platform using magnetic actuators for in vitro cell seeding. The setup is compatible with multi-well plates and allows for high throughput, thereby reducing the timeline to develop more targeted cancer therapy. Cancer treatment screening typically involves use of a synthetic polymer-based substrate, which leads to undesired defects in cell cultures. Traditional actuators that cause these phenomena are controlled by pressure or electromechanical forces, which do not accurately replicate natural cell environments. However, magnetic actuators as implemented in the Purdue University technique are adaptable in both amplitude and frequency to apply strain that suspends cells over a gap between actuators. The system can now capture dynamic physiological conditions in 3D.

Advantages:

-Biomimetic

-More Accurate and Effective Cancer Therapy

-High Throughput

Potential Applications:

-Cancer Screening

-Microbiology

-Tissue Engineering

Technology Validation:

Purdue researchers designed a laboratory experiment to mimic an in vivo respiratory environment and achieved a physiological strain range of 10-12%

Technology ID
2019-LEE-68700

Category
Materials Science & Nanotechnology/Materials Testing & Characterization Tools
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation
Pharmaceuticals/Research Tools & Assays

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Recent Publication:

"High-Throughput Magnetic Actuation Platform to Induce Biomimetic Mechanical Cues on 3D Cell Culture"

Engineering in Medicine and Biology

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TRL: 3

Intellectual Property:

Provisional-Patent, 2019-07-23, United States

Utility Patent, 2020-07-22, United States

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