

# **3D Cell Culture Market by Scaffold Format (Scaffold Based and Scaffold Free System), Products (Hydrogel / Extracellular Matrix (ECM), 3D Bioreactor, 3D Petri Dish, Hanging Drop Plate, Microfluidic System, Micropatterned Surface, Microcarrier, Solid Scaffold, and Suspension System), Application Areas (Cancer Research, Drug Discovery and Toxicology, Stem Cell Research, Tissue Engineering and Regenerative Medicine), Purpose (Research Use and Therapeutic Use), and Key Geographical Regions (North America, Europe, Asia-Pacific, Latin America, MENA and Rest of the World): Industry Trends and Global Forecasts (4th Edition), 2022-2035**

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## **Abstracts**

The 3D cell culture market is expected to reach USD 1.2 billion by 2022 anticipated to grow at a CAGR of 16.7% during the forecast period 2022-2035.

For a long time, animal testing has been a primary method in biomedical research due to the similarities animals share with humans in genetics, anatomy, and physiology. Mice, in particular, share approximately 80% of their genome with humans, making them valuable in various studies. However, concerns about animal welfare have led to the establishment of the 3Rs principle—Replacement, Reduction, and Refinement—to minimize animal use in research. Since 1985, this initiative has reduced animal testing by 50% by 2018. Breeding and housing animals for research purposes are expensive

and require skilled labor. Moreover, differences in morphology and physiology between animal cell cultures and cells cultured in monolayers limit the faithful replication of the natural in vivo environment. To overcome these challenges, there's a growing trend towards transitioning from animal-based testing to 3D cell models. Advances in biotechnology and materials science have enabled the creation of various 3D cell culture systems, proving invaluable in cancer research, drug discovery, and tissue engineering. Over 140 companies now offer these systems in scaffold-based, scaffold-free, and 3D bioreactor formats. These systems simulate tissue microenvironments better, enhance cell interactions, accurately assess drug toxicity and cellular responses, and enable co-culture of multiple cell types. Complex 3D cell models are becoming viable replacements for animal models, providing reproducible results and serving as more effective in vivo models across various applications. This shift has drawn considerable attention from venture capital firms and investors, driving research into formats like organoids and organ-on-a-chip technology. Collaborations and scientific literature on 3D cell culture systems, bioreactors, and cell culture products are increasing, indicating growing interest and progress in this field. The ongoing innovation and transition from traditional 2D cell cultures and animal testing to 3D cell models are expected to significantly boost the 3D cell culture industry in the coming years.

## Report Coverage

The report conducts an analysis of the 3D cell culture market based on scaffold format, products, application areas, purpose, and key geographical regions

It evaluates factors influencing market growth such as drivers, restraints, opportunities, and challenges.

The report examines potential advantages and barriers within the market and provides insights into the competitive landscape for top market players.

Revenue forecasts for market segments are provided concerning four major regions.

A comprehensive analysis categorizes 3D cell culture systems into scaffold-based systems (including hydrogels/ECMs, solid scaffolds, micropatterned surfaces, and microcarriers), scaffold-free systems (comprising attachment-resistant surfaces, suspension systems, and microfluidic systems), and 3D bioreactors.

An extensive review of fabrication techniques used for creating 3D matrices and scaffolds is conducted, highlighting materials, fabrication processes, merits, drawbacks, and diverse applications across different methods.

A thorough examination of companies offering varied 3D cell culture systems includes parameters such as establishment year, employee base, global presence, cell culture format, product types, services, and associated reagents/consumables.

Detailed evaluations of scaffold-based and scaffold-free products consider developmental status, product types, sources, materials used, and profiles of companies involved in their development.

A comprehensive analysis of 3D bioreactors includes types, developmental status, working volume, scale of operation, manufacturing processes, application areas, and companies involved.

Key application areas like cancer research, drug discovery, toxicology, stem cell research, tissue engineering, and regenerative medicine utilizing various 3D cell culture products are extensively reviewed.

Elaborate profiles of leading companies engaged in scaffold-based, scaffold-free cell culture systems, and 3D bioreactors are provided, including company overview, financial details (if available), product portfolio, recent developments, and future outlook.

Analysis of investments made (2016-2022) in small and mid-sized companies engaged in 3D cell culture product development across various financing stages is included.

In-depth analysis of partnerships established since 2015 related to 3D cell culture products considering agreement types, cell culture formats, product types, and active players is conducted.

A thorough examination of patents filed/granted (2016-2021) and scientific articles published (since 2019) related to 3D cell culture products considering focus areas, contributors, and geographic distribution is provided.

Detailed assessment of 3D bioreactor competitiveness is conducted,

considering factors such as supplier power, key features, supported molecules, cell cultures, and application areas.

A case study on 3D cell culture products for organoids and organ-on-chips, covering developmental status, application areas, and developer company details is presented.

Insights from an industry-wide survey featuring inputs from experts involved in 3D cell culture product development across various aspects like product focus, development status, fabrication methods, application areas, services offered, and market opportunities are analyzed.

## Key Market Companies

3D Biotek

Advanced BioMatrix

Alphabioregen

Corning Life Sciences

REPROCELL

CN Bio Innovations

Emulate

InSphero

MIMETAS

TissUse

BISS TGT

Celartia

Cell Culture

EBERS

Flexcell International

PBS Biotech

Synthecon

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