

3D Bioprinting Market 2023 Global Analysis, Opportunities and Forecast to 2030 | GeSIM GmbH, Cellink AB, REGEMAT 3D

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Overview:

3D bioprinting is an advanced manufacturing technique that involves printing biomaterials, living cells, growth factors, and other compounds to print tissues and organs. It has applications in developing skin, cartilage, bones, and vascular grafts for research and medical purposes.



3D bioprinting Market registering a CAGR of 21% by 2030

According to Coherent Market Insights study, The [3D bioprinting market](#) was valued at US\$ 875.33 Mn in 2021 and is forecast to reach a value of US\$ 4,815.02 Mn by 2030 at a CAGR of 21% between 2022 and 2030.

Market Dynamics:

The factors driving the growth of the 3D bioprinting market include evolving healthcare needs owing to rising cases of organ failures and increasing demand for personalized grafts and implants. The growing geriatric population and rising prevalence of chronic diseases have increased the demand for 3D bioprinted organs for transplantation purposes. Another factor propelling the market growth includes increasing funding and government initiatives for supporting research activities in the field of regenerative medicines using 3D bioprinting technology. However, high costs associated with 3D bioprinting and lack of skilled professionals may hamper market growth during the forecast period.

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Potential for tissue engineering is a major driver for 3D bioprinting market

3D bioprinting holds huge potential for tissue engineering and regenerative medicine applications. It allows the fabrication of 3D functional living and non-living tissues for various applications in regenerative medicine and tissue engineering. 3D bioprinting technology enables precise placement of biological materials such as cells, growth factors, and biomolecules layer-by-layer to fabricate 3D tissue constructs. These constructs have applications in developing skin, bone, cartilage, liver, and other transplantable tissues. Therefore, the ability to bioprint complex 3D living tissues with precisely positioned multiple cell types is driving significant interest and research in 3D bioprinting technology.

Increasing demand for organ transplants is fueling the 3D bioprinting market

The increasing demand for organ transplants due to rising prevalence of chronic diseases and failure of existing treatments is a major factor propelling the 3D bioprinting market growth. As per the estimates of the U.S. Department of Health and Human Services, over 113,000 patients in the United States are currently on the waiting list for organ transplants and over 20 people die each day due to lack of donor organs. 3D bioprinting holds promise to address this demand-supply gap by enabling fabrication of transplantable tissues and organs. This is expected to boost adoption of 3D bioprinting technology by pharmaceutical and biotech companies engaged in developing artificially bioprinted tissues and organs.

High costs associated with 3D bioprinting technology can restrain market growth

The high costs associated with 3D bioprinting are one of the key factors that can restrain the market growth. Establishment of a 3D bioprinting laboratory requires significant investments in sophisticated 3D bioprinters, biomaterials, imaging equipment, and employment of skilled technicians. The bioinks used for 3D bioprinting of complex living tissues also involve high material costs. Additionally, costs related to product development and clinical trials further increase the overall commercialization expenses. These high costs make 3D bioprinting technology unaffordable for small firms and developing countries, thus posing a major challenge for widespread market adoption.

Growing collaborations provide opportunities for advancement of 3D bioprinting

Increasing collaborations between industry players, academic research institutes, and government organizations are offering significant opportunities for advancement of 3D bioprinting technology. Companies are collaborating with research institutes and universities to gain expertise in multidisciplinary areas of tissue engineering, materials science, biomanufacturing and conduct joint research. For instance, Organovo collaborated with Wake Forest Institute for Regenerative Medicine to advance development of 3D bioprinted functional liver tissues. Moreover, government funding through initiatives such as the U.S. Defense Advanced Research Projects Agency (DARPA), focuses on research and infrastructure development for 3D bioprinting of tissues and organs. Such collaborations provide ample

opportunities for 3D bioprinting companies to develop innovative products and technologies at a faster pace.

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Advancements toward development of vascularised tissues is a major trend in 3D bioprinting market

One of the major trends observed in the 3D bioprinting market is the increasing R&D focus on development of vascularised tissues having microvasculature similar to native tissues. This involves sophisticated bioprinting techniques to print tissue constructs along with intricate vascular networks that can anastomose or connect with host vasculature after implantation. Production of vascularised 3D tissues will address current limitations of bioprinted constructs in terms of mass transfer of nutrients, gas exchange and waste removal. Several companies are conducting extensive research to develop specialized bioinks, multi-nozzle bioprinters and computer-aided tissue design tools capable of fabricating complex vascularised tissue models. This trend reflects the evolving needs in regenerative medicine and drives technological innovation for manufacturing transplantable 3D tissues on an industrial scale.

The major players operating in the market include:

- 3D Systems Corporation
- Cyfuse Biomedical KK
- GeSIM GmbH
- 3D Bioprinting Solutions
- Aspect Biosystems Ltd.
- Organovo Holdings Inc.
- ARCAM AB (GE Company)
- Cellink AB
- RegenHU SA
- REGEMAT 3D
- EnvisionTEC GmbH and Stratasys Ltd

These companies are focusing on new product development, partnerships, collaborations, and mergers and acquisitions to increase their market share and maintain their position in the market.

Detailed Segmentation:

Global 3D Bioprinting Market, By Technology:

- Syringe/extrusion Bioprinting
- Inkjet Bioprinting

- Magnetic Levitation Bioprinting
- Laser-assisted Bioprinting
- Other Technologies

Global 3D Bioprinting Market, By Component:

- 3D Bioprinters
- Biomaterials
- Scaffolds

Global 3D Bioprinting Market, By Application:

- Drug Testing and Development
- Regenerative Medicine
- Food Testing
- Research
- Other Applications

Market segment by Region/Country including:

- North America (United States, Canada and Mexico)
- Europe (Germany, UK, France, Italy, Russia and Spain etc.)
- Asia-Pacific (China, Japan, Korea, India, Australia and Southeast Asia etc.)
- South America (Brazil, Argentina and Colombia etc.)
- Middle East & Africa (South Africa, UAE and Saudi Arabia etc.)

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Frequently Asked Questions (FAQs):

- What are the key factors hampering growth of the 3D Bioprinting market?
- What are the major factors driving the global 3D Bioprinting market growth?
- Which is the leading component segment in the 3D Bioprinting market?
- Which are the major players operating in the 3D Bioprinting market?
- Which region will lead the 3D Bioprinting market?
- What will be the CAGR of 3D Bioprinting market?
- What are the drivers of the 3D Bioprinting market?

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