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Bio-Printing Markets: A Ten-Year Opportunities Analysis

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About Us

SmarTech Markets Publishing delivers industry analysis and market forecasts for the 3D printing/additive manufacturing industry. Our coverage provides insight for those companies offering 3D printing equipment, materials, services, and software, as well as companies who operate in industries where 3D printing will begin to play a role in the near future.

When a company purchases a report from SmarTech Markets Publishing or engages us for custom consulting, it receives:

- Comprehensive analysis that reflects today's 3D printing market realities and tomorrow's profitable possibilities
- Detailed forecasts that provide our clients with compelling evidence to support important strategic decisions and give them an edge over the competition.
- Actionable recommendations identifying where money will be made and where it will be lost.
- Candid market assessments based on today's best strategic thinking, not just data dumps from the Internet.

SmarTech offerings complement internal product planning technology road-mapping, as well as provide low-cost knowledge enhancement for firms in the 3D printing industry.

Smartech Team

Lawrence Gasman

Lawrence Gasman is the founder of SmarTech Markets Publishing and is acknowledged worldwide as an expert on technology forecasting.
He has previously founded two other industry analyst firms and has also carried out a wide range of technology assessments in areas ranging from optical networking to advanced materials to
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Forsyth is a Senior Business Analyst at SmarTech Markets Publishing, where his work covers the 3D printing, digital manufacturing and industrial automation sectors. Forsyth holds a Masters degree in Commerce from the University Of Virginia's McIntire School of Commerce, where he specialized in strategy and
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Rick McCormack

Rick McCormack has over 20 years of effective business development, sales and marketing experience in a variety of advanced technology based markets. Rick understands the importance of listening and acting on his clients wants and needs. His main focus at SmarTech is to cultivate long-lasting business relationships with firms seeking guidance in the 3D printing space.

About The Report

In this report, SmarTech identifies the opportunities in the emerging bio-printing industry. The current state of the sector is strategically analyzed, showing exactly where the business opportunities will be found in the future. This report will help executives understand how bio-printing will evolve over the next two decades and it's effect on related industries.

The scope of this report spans all major bio-printing products that will become available in the next twenty year, organized on a timeline to commercialization. Products covered include toxicology assays, localized direct bio-printing therapies, printed organ patches, and breast reconstruction therapies, along with various opportunities in tissue that include skin, cartilage, cornea, bone, pancreas, and kidney tissues.

This report splits the bio-printer category into high-end and low-end categories and provides separate forecasts for each. In addition to the bio-printer numbers themselves, this report of covers and forecasts global bio-printer labs, materials, and software to 2023. Material forecasts are further broken out into cellular materials, hydrogels, and biodegradable plastics.

This report also provides insight on other challenges the bio-printing industry faces, including material supply chains, software development, microvasculature, biological interactions over time, and regulatory clearance issues.

A Note On Forecasting Methodology

The forecasts were created from information gathered from professionals in the bio-printing industry, as well as professionals working in related medical and dental sectors. We also referenced numerous other industry reports and publicly available financial statements to come up with what we believe to be accurate forecasts available on the market.

When creating our forecasts, SmarTech strove to deliver the most detail possible, without standing on delicate assumption. Forecasts were designed from the bottom up when possible, incorporating numbers from individual 3D printing companies where this information was available. In all forecasts in this report, we strive to lay out the logical progression of our forecasts so that the reader can follow at all times how we came to our calculations.

Related Reports

3D Printing in Medical And Dental Markets: An Opportunity Analysis and Ten-Year Forecast : 2014-2023	Published December 2013
Markets For 3D Printing Materials: 2013 - 2022	Published September 2013
Personal 3D Printers: Market Forecasts and Market Share Analysis: 2013 - 2022	Published August 2013
3D Printing Markets: Hope, Hype, and Strategies	Published March 2013

Exhibit 1 10-Year Forecast of Global Bio-Printing Labs

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Labs In US	55	69	85	108	129	148	169	198	253	324	401
Labs In Europe	154	185	221	269	315	347	387	431	524	652	763
Labs In Asia	39	55	78	110	148	187	237	300	412	578	763
Bio-Tech Company Research Labs	30	35	40	46	52	60	71	83	97	113	132
Global Bio-Printing Labs	278	344	423	533	645	742	864	1011	1286	1667	2059
% Growth			23%	26%	21%	15%	17%	17%	27%	30%	24%

Content Excerpt (2/4)

First excerpt, taken from the "Biological Laser Printing" sub-section of the report:

Laser-based bio-printers are also capable of creating microbeads, microcapsules, and microstrands. These microstructures can elegantly be formed in the BioLP process itself, without additional manufacturing steps. The binder ejected from the print ribbon with the cells makes up the microstructure, while surface tension and cohesion forms them into droplets as the biomaterials moves from the print ribbon to the print surface.

Microstructures can be also be used by other bio-printing processes, however they must be manufactured by alternative processes such as electrostatic bead generation. External microstructure manufacturing faces two big problems. First, cell survivability rates are only about half of what BioLP's are able to attain (85% and 37% respectfully). Also, the extra step in manufacturing increases the costs for any product printed on another type of bio-printer that contains microstructures.
For these reasons, the future of microstructures seems to reside in BioLP. As microstructures become more important to tissue design, the ability of BioLP bio-printers to manufacture microstructures could become a source of major competitive advantage.

Content Excerpt (3/4)

Continued . . .

These encapsulating structures could prove to be invaluable to future development of the bio-printing sector. Below is a discussion of the usefulness and potential applications of these microstructures in the bio-printing industry, organized by micro-structure.

Microbeads- 3D-printed microenvironments created directly from printing from a ribbon with alginate content on to a surface loaded with $CaCl_2$. The alginate crosslinks with $Ca^{2+}$to preserve the droplets. Microbeads allow for a greater complexity of tissue design by creating pockets of different types of cells that mimic real tissue. Furthermore, the 3D geometry of microbeads could help encourage communication across printed layers of cells, or even be used to print 3D arrays of cells.

Microbeads can be loaded with any number of useful components, including cells, drugs, soluble factors, and proteins. One potential application of microbeads is drug screening, where known concentration of drugs could be locally dispersed amongst specific types of cells to observe the effects. Currently, BioLP's are capable of printing microbeads with an 85% survivability rate.

The section goes on to discuss microcapsules, microstrands, and spheroid structures and their potential commercial applications.

Content Excerpt (4/4)

Exhibit 2-2 Bio-Printing Commercialization Timeline

Toxicology Assays 1-2 years
Bio-Printed Skin and Cartilage Tissues 5-10 years
Breast Reconstruction Scaffolds 5-7 years
Partial Organ Therapies (pancreas, bone, heart muscle patches) 10-15 years
Total Organ Therapies 20+ years

As seen in Exhibit 2-2, there is a potential for consistent commercialization in bio-printing applications. This bodes well for the industry as a whole, as regular product releases will allow bio-printing companies to become a self-sustaining industry within 5 to 10 years. This also means that there is potentially for sustained healthy growth in this sector for 20 years.

It is important to recognize that this timeline only includes the apparent opportunities for bio-printing technologies. There is no doubt that, as research advances and materials drastically drop in value, that new opportunities will reveal themselves that we currently can't see. While it isn't certain, these opportunities are estimated to make up about 20% of the eventual value of the bio-printing industry.

Information in these slides is taken from:

Bio-Printing Markets: A Ten-Year Opportunity Forecast

For more details of this report and any questions about other reports on the 3D printing industry, please contact Rick McCormack at:

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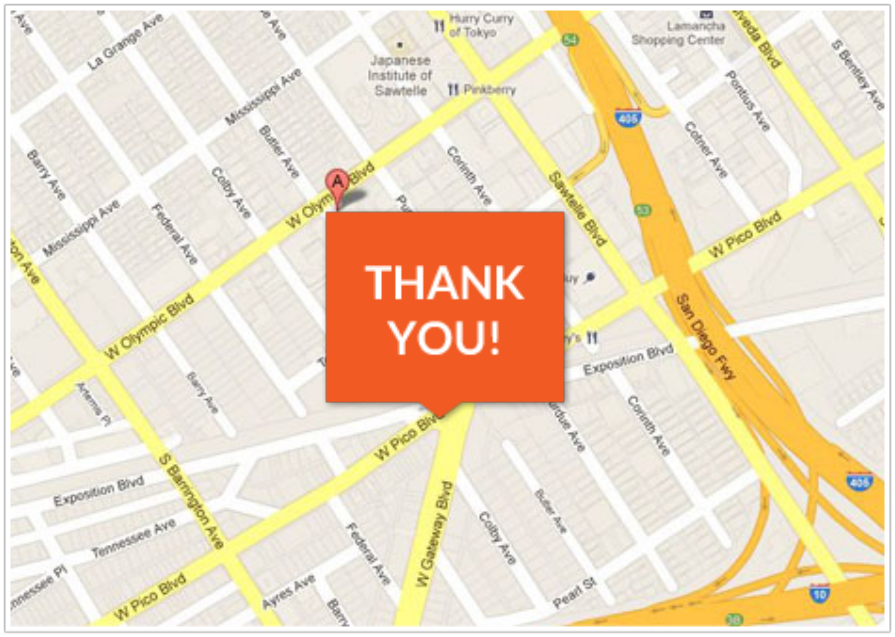
Contact Us

Please contact us during normal business hours of 8:30-5:30 East Coast time (US). You can also fill out our contact form at any time and we will follow up with you promptly.



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