

Organ-on-a-Chip Market to Worth USD 1.64 Billion by 2032 at 34.04% CAGR – SNS Insider

Government Funding and Technological Innovations Propel Organ-on-a-Chip Market as a Game-Changer in Drug Development and Toxicity Testing

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According to Research by SNS Insider, the global [Organ-on-a-Chip Market](#) size was valued at USD 117.67 million in 2023 and it's projected to reach USD 1,641.51 million by 2032, the market is expected to grow at a remarkable compound annual growth rate (CAGR) of 34.04% from 2024 to 2032.



The organ-on-a-chip market is driven by an increase in demand for advanced drug discovery platforms and a growing need for realistic human disease models. Conventional processes of drug development are expensive, time consuming, and often fail to predict human responses accurately.

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Organ-on-chip technology is revolutionizing drug discovery by offering human-mimetic models that reduce reliance on animal testing and improve predictive accuracy.”

SNS Insider

The organ-on-chip technology overcomes these challenges by mimicking human organ functions on a microfluidic chip, allowing researchers to examine drug efficacy and toxicity in a more physiologically relevant setting. Personalised medicine is another major driver of this trend. The organ-on-a-chip platforms enable researchers to make patient-specific models contributing to the rapid development of personalised treatments for complex diseases like cancer, cardiovascular, and

neurodegenerative disorders. Furthermore, the rise in demand from the pharmaceutical industry to reduce animal testing in research and development (R&D) is spurring rapid adoption of organ-on-a-chip technology. Market growth is further boosted by various governments and regulatory bodies across the globe promoting alternative testing methods.

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Segmentation Highlights

By Products & Services

In 2023, the services segment accounted for 53% of the revenue share. The market for such contract services is anticipated to rise with the likely growing demand for custom organ-on-a-chip development, consulting, and technical support services. With technology growing in complexity, firms began outsourcing these specialized tasks to experts, thus enabling them to focus on core research. Service providers also provide specialized solutions encompassing chip design, optimization, and integration with state-of-the-art sensors to specifically address the demand from pharmaceutical and biotechnology companies. This trend is expected to continue as the market expands, with services playing a critical role in enabling widespread adoption of organ-on-a-chip platforms.

By Application

In 2023, the drug discovery segment held the highest revenue share 61% of the market. Organ-on-chip technology is revolutionising drug discovery with human relevant models for preclinical testing. This enables the study of drug efficacy, toxicity, and pharmacokinetics in a more authentic way which minimizes the risks of late-stage clinical trial failures. They also allow for the creation of tailored therapies for complex illnesses such as cancer and neurodegenerative diseases. Organ-on-a-chip systems emulate human organ functions, enabling more ethical and cost-effective animal-free testing, making these systems a powerful tool for all pharmaceutical companies striving to optimize R&D time and success rate over their screening pipelines.

By End-Use

Pharmaceutical and biotechnology companies were the largest end-users in 2023, accounting for 73% of the market revenue. These firms are leveraging organ-on-a-chip technology to accelerate drug development, reduce costs, and improve the accuracy of preclinical testing. Academic, research institutions also account for a sizable share in terms of end-users, deploying such software platforms for disease modelling, basic research etc. Increasing regulatory pressure to reduce animal testing is also further spurring adoption in both sectors. As the technology matures, its applications are expanding, with end-users increasingly recognizing its potential to revolutionize drug discovery.

Regional Market Analysis

North America led the global organ-on-a-chip market with 51% of the market share by revenue in 2023. The region's leadership is attributed to the presence of major pharmaceutical and biotechnology companies, significant R&D investments, and supportive government initiatives. In the U.S., powerful institutions such as the National Institutes of Health (NIH) and the Food and Drug Administration (FDA) are vigorously encouraging the use of organ-on-a-chip technology.

Europe is another prominent market, driven by stringent regulations on animal testing and a strong focus on innovative healthcare solutions. Various organ-on-chip projects funded by the

European Union's Horizon 2020 program have also been initiated, which is anticipated to fuel the growth of the organ-on-a-chip technology market. On the other hand, Asia-Pacific is estimated to grow at the highest rate over the forecast period, owing to rising healthcare infrastructure investments, increasing pharmaceutical R&D activities and willingness for organ-on-a-chip applications.

Key Players in Organ on a chip Market

- Emulate, Inc.
- MIMETAS B.V.
- Valo Health
- Nortis, Inc.
- AxoSim
- BICO
- CN Bio Innovations Ltd
- The Charles Stark Draper Laboratory, Inc.
- SynVivo, Inc.
- AlveoliX AG

Recent Developments

- In 2023, Emulate, Inc., a leading provider of organ-on-a-chip technology, partnered with a major pharmaceutical company to develop a liver-on-a-chip platform for drug toxicity testing. This collaboration aims to enhance the accuracy of preclinical drug testing and reduce reliance on animal models.
- In 2023, the U.S. FDA announced a new initiative to promote the use of organ-on-a-chip technology in regulatory decision-making. The initiative includes funding for research projects and the establishment of guidelines for validating organ-on-a-chip platforms.

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