

U.S. Organ-on-a-Chip Market Size, Share & Trends Analysis Report By Product & Service, By Application (Drug Discovery, Toxicology Research), By End-use (Academic & Research Institutes, Pharmaceutical & Biotechnology Companies), And Segment Forecasts, 2025 - 2033

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Abstracts

U.S. Organ-on-a-Chip Market Summary

The U.S. organ-on-a-chip market size was estimated at USD 71.7 million in 2024 and is projected to reach USD 940.4 million by 2033, growing at a CAGR of 33.14% from 2025 to 2033. This growth is driven by increasing demand for more predictive preclinical testing models, a shift from animal testing, and rapid advancements in microfluidics, tissue engineering, and personalized medicine.

As pharmaceutical companies, biotech firms, and research institutions seek more accurate, ethical, and cost-effective ways to study human physiology and disease, organ-on-a-chip technologies are gaining traction as a transformative solution across the biomedical landscape.

Advancements in Microfluidics & Tissue Engineering

Advancements in microfluidics and tissue engineering have become a foundational driver of growth in the U.S. organ-on-a-chip industry. Microfluidic technologies enable precise control over the flow of nutrients, drugs, and mechanical stimuli at a microscale, closely mimicking the dynamic conditions of the human body. Tissue engineering complements this by enabling the creation of 3D cellular structures using human-

derived cells, which can be designed to functionally resemble specific organs like the liver, lung, heart, or gut. These innovations have significantly improved the physiological relevance of preclinical testing, offering researchers more predictive and ethically responsible tools for studying disease and drug response.

The integration of stem cell technology, particularly induced pluripotent stem cells (iPSCs), further enhances the value of OOC platforms by allowing the development of patient-specific models. These personalized chips can reflect genetic variations and disease phenotypes unique to individuals, supporting precision medicine approaches. Moreover, recent innovations have allowed multiple organ systems to be connected on a single chip, enabling researchers to study how drugs or diseases affect the body rather than in isolation. This convergence of engineering and biology fuels sustained demand across the pharmaceutical, biotech, and academic research.

U.S. Organ-on-a-Chip Market Report Segmentation

This report forecasts revenue growth and provides an analysis on the latest trends in each of the sub-segments from 2021 to 2033. For the purpose of this report, Grand View Research has segmented the U.S. organ-on-a-chip market report based on the product & service, application, and end-use:

Product & Service Outlook (Revenue, USD Million, 2021 - 2033)

Products

Instrument

Devices

Liver-on-a-Chip

Lung-on-a-Chip

Intestine-on-a-Chip

Kidney-on-a-Chip

Heart-on-a-Chip

Others

Services

Application Outlook (Revenue, USD Million, 2021 - 2033)

Drug Discovery

Toxicology Research

Others

End-use Outlook (Revenue, USD Million, 2021 - 2033)

Academic & Research Institutes

Pharmaceutical & Biotechnology Companies

Others

This report can be delivered to the clients within 2 Business Days

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