

Global Human Liver Model Market: 2026 Edition

<https://marketpublishers.com/r/GA1E34C2751CEN.html>

Date: April 2026

Pages: 148

Price: US\$ 2,250.00 (Single User License)

ID: GA1E34C2751CEN

Abstracts

The human liver model is a scientific and technological representation of the human liver that is used to study its structure, function, and behavior in various physiological and pathological conditions. These models are crucial for applications in drug discovery, toxicology testing, disease modeling, regenerative medicine, and personalized healthcare. Traditional liver research relied heavily on animal models and 2D cell cultures, but these approaches often fall short of accurately replicating human liver physiology. The global human liver model market value in 2024 stood at US\$1.64 billion, and is projected to reach US\$3.81 billion by 2030.

The global human liver model market is primarily driven by the increasing prevalence of liver diseases such as non-alcoholic fatty liver disease (NAFLD/MASLD), alcoholic liver disease (ALD), viral hepatitis, and liver cancer. This growing demand is further propelled by advancements in organ printing technologies like 3D bioprinting, organ-on-a-chip platforms, and organoids, which allow for the creation of more physiologically relevant and predictive human liver models compared to traditional 2D cell cultures or animal models. Additionally, a strong emphasis on reducing reliance on animal testing due to ethical concerns and the inherent species differences that often lead to inaccurate drug safety and efficacy predictions in humans, significantly boosts the adoption of human-derived liver models. Finally, the increasing demand for therapeutic drugs for liver cancer and other liver conditions, coupled with the high costs and failure rates associated with conventional drug discovery, incentivizes pharmaceutical and biotechnology companies to invest in these advanced models for more efficient drug screening, toxicity testing, and personalized medicine approaches. The global human liver model market value is projected to grow at a CAGR of 15.03%, during the forecast period of 2025-2030.

Market Segmentation Analysis:

By Product Type: According to the report, based on product type, the global human liver model market can be divided into two segments: 2D human liver model and 3D human liver model. 2D human liver model segment is further segmented based on product as cell lines and primary human hepatocytes and 3D human liver model segment is bifurcated as liver-on-a-chip, organoids, spheroids and 3D bio printed tissues. 2D human liver model segment acquired majority of share in the market in 2024 primarily due to its cost-effectiveness, simplicity, and well-established protocols. Many researchers still rely on 2D models for high-throughput screening and initial drug toxicity testing, where their efficiency and reliability provided a practical solution despite their limitations in fully replicating in vivo conditions. However, the 3D human liver model segment is expected to grow the fastest because these models offer significantly enhanced physiological relevance, better mimicking the complex architecture, cell-cell interactions, and metabolic functions of a real human liver compared to 2D cultures. This improved accuracy leads to more reliable predictions in drug discovery, toxicity testing, and disease modeling, reducing late-stage drug failures and the need for animal testing. As technologies like 3D bioprinting and organ-on-a-chip mature and become more accessible, their capacity for higher throughput and scalability is also increasing, making them increasingly attractive for pharmaceutical and biotechnology companies seeking more predictive and human-relevant research tools.

By Application: According to the report, based on application, the global human liver model market can be divided into four segments: ADME Studies, toxicology testing, disease modeling and others. ADME segment acquired majority of share in the market in 2024 because these studies are critical and often mandated early steps in drug development. By using human liver models for ADME studies, pharmaceutical companies can more accurately simulate human physiological conditions, allowing them to filter out unsuitable drug candidates earlier in the costly and time-consuming drug discovery pipeline, thereby saving significant resources and accelerating drug development. Meanwhile, the toxicology testing segment is expected to grow the fastest during the forecasted period, driven by rising concern about drug-induced liver injury (DILI) and other organ toxicities, leading to increased demand for robust preclinical models that can accurately predict adverse effects in humans. Secondly, stricter regulatory guidelines worldwide are pushing pharmaceutical companies to conduct more comprehensive and reliable toxicity assessments earlier in the drug development pipeline. Finally, the limitations and ethical concerns associated with traditional animal testing are driving a shift towards more human-relevant in vitro models, like the advanced 3D liver models, for more accurate and predictive toxicology screens.

By End-use: According to the report, the global human liver model market is bifurcated

into three types of end-uses: pharmaceutical & biotechnology companies, contract research organizations, and academic and research institutes. Pharmaceutical & biotechnology companies segment acquired the majority share in the global human liver model market in 2024 because they are the primary drivers of drug discovery and development. These companies heavily rely on human liver models for crucial preclinical studies, including assessing drug metabolism (ADME), evaluating drug-drug interactions, and, most importantly, identifying potential hepatotoxicity. The ability of these models to more accurately predict human physiological responses, thereby reducing costly failures in later clinical trial stages, makes them indispensable tools for pharmaceutical and biotech firms striving for efficient and safer drug development. However, CROs are projected for the fastest growth as pharmaceutical and biotech companies increasingly outsource R&D to leverage specialized expertise, advanced technologies, and cost efficiencies. This allows them to accelerate drug development and manage resources more effectively without the need for significant in-house investment in complex human liver model platforms.

By Region: The report provides insight into the human liver model market based on the geographical operations, namely, North America, Europe, Asia Pacific and Rest of the World. North America human liver model market enjoyed the highest market share in 2024 due to its robust healthcare infrastructure, significant R&D expenditure by pharmaceutical and biotechnology companies, and a favorable regulatory environment supporting advanced preclinical testing. Meanwhile, Asia Pacific is projected for the fastest growth driven by increasing investments in medical research, a burgeoning biotech industry, rising prevalence of liver diseases, and improving healthcare infrastructure across the region.

Global Human liver model Market Dynamics:

Growth Drivers: One of the most important factors driving the growth of the global human liver model market is the increasing prevalence of liver diseases worldwide. Conditions like non-alcoholic fatty liver disease (NAFLD/MASLD), alcoholic liver disease (ALD), viral hepatitis, and liver cancer are on the rise globally due to lifestyle changes and other factors. This escalating disease burden creates an urgent and growing demand for more accurate, human-relevant research tools to better understand disease mechanisms, develop effective therapies, and conduct efficient drug discovery and toxicity testing. Other factors driving the growth of global human liver model market include growing demand for alternatives to animal testing, increasing focus on personalized medicine, growing investment in liver research, the growing need for early drug toxicity diagnosis etc.

Challenges: One significant challenge faced by the global human liver model market is the high cost and technical complexity associated with developing and maintaining advanced 3D models. While these models offer superior physiological relevance, their creation often requires specialized equipment, skilled personnel, and significant financial investment. This complexity can limit their accessibility and scalability, particularly for smaller research institutions or companies, hindering widespread adoption despite their clear advantages over traditional 2D systems.

Trends: A major trend that will further drive the growth of the global human liver model market is the advancement and increasing adoption of 3D bioprinting and organ-on-a-chip technologies. These innovations are enabling the creation of more sophisticated, physiologically relevant, and high-throughput human liver models that better mimic in-vivo conditions. This improved accuracy leads to more reliable data in drug discovery, toxicity testing, and disease modeling, ultimately accelerating the development of safer and more effective treatments while reducing reliance on traditional, less predictive methods. The market is also projected to grow at a fast pace during the forecast period, due to various other latest trends such as integration of AI and machine learning, advancements in organ printing and tissue engineering technologies, shift from 2D to advanced 3D and ex vivo models, rise of hybrid and in silico models etc.

Competitive Landscape and Recent Developments:

The global human liver model market currently presents a moderately fragmented competitive landscape, although it is showing clear signs of moving towards consolidation, particularly within its more technologically advanced segments. The fragmentation stems from rapid pace of innovation in tissue engineering, microfluidics, and stem cell biology continually giving rise to new biotech startups. Regional market differences and the significant contributions from academic research also contribute to this distributed competitive environment. However, consolidation is evident in the dominance of a few key players in the cutting-edge 3D model segments (like InSphero, CN Bio Innovations, and Emulate), who possess strong patent portfolios and are often preferred partners for large pharmaceutical companies. This trend is further driven by strategic mergers and acquisitions (M&A) and increasing partnerships, as larger entities seek to integrate specialized technologies and expertise. Key players of global human liver model market are:

Organovo Holdings

InSphero

BioIVT LLC

Emulate Inc.

MatTek

Mimetas

CN Bio Innovations Ltd.

Cyfuse Biomedical KK

Corning Incorporated

Phoenix Bio

Stemcell Technologies

Pandorum Technologies

Kirkstall Ltd

The key players are constantly investing in strategic initiatives, such as adoption of new technologies, introducing their products to emerging markets and more, to maintain a competitive edge in this market. For instance, In February 2025, CN Bio launched the PhysioMimix® DILI assay kit: Human 24, an all-in-one kit providing rapid access to their FDA-recognized human Drug-Induced Liver Injury (DILI) assay. This kit streamlines workflows and allows users to assess up to eight conditions simultaneously, leveraging their highly functional and metabolically active liver microphysiological system (MPS).

Contents

1. EXECUTIVE SUMMARY

2. INTRODUCTION

2.1 Human Liver Model: An Overview

2.1.1 Introduction to Human Liver Model

2.1.2 Benefits of Human Liver Model

2.2 Human Liver Model Segmentation: An Overview

2.2.1 Human Liver Model Segmentation

3. GLOBAL MARKET ANALYSIS

3.1 Global Human Liver Model Market: An Analysis

3.1.1 Global Human Liver Model Market: An Overview

3.1.2 Global Human Liver Model Market by Value

3.1.3 Global Human Liver Model Market by Product Type (2D Human Liver Model and 3D Human Liver Model)

3.1.4 Global Human Liver Model Market by Application (ADME Studies, Toxicology Testing, Disease Modeling and Others)

3.1.5 Global Human Liver Model Market by End-use (Pharmaceutical & Biotechnology Companies, Contract Research Organizations and Academic and Research Institutes)

3.1.6 Global Human Liver Model Market by Region (North America, Europe, Asia Pacific and Rest of the World)

3.2 Global Human Liver Model Market: Product Type Analysis

3.2.1 Global Human Liver Model Market by Product Type: An Overview

3.2.2 Global 2D Human Liver Model Market by Value

3.2.3 Global 2D Human Liver Model Market by Product Type (Cell Lines and Primary Human Hepatocytes)

3.2.4 Global Cell Lines 2D Human Liver Model Market by Value

3.2.5 Global Primary Human Hepatocytes 2D Human Liver Model Market by Value

3.2.6 Global 3D Human Liver Model Market by Value

3.2.7 Global 3D Human Liver Model Market by Product Type (Liver-on-a-chip, Organoids, Spheroids and 3D bio printed tissues)

3.2.8 Global Liver-on-a-chip 3D Human Liver Model Market by Value

3.2.9 Global Organoids 3D Human Liver Model Market by Value

3.2.10 Global Spheroids 3D Human Liver Model Market by Value

3.2.11 Global 3D Bio printed Tissues Human Liver Model Market by Value

3.3 Global Human Liver Model Market: Application Analysis

- 3.3.1 Global Human Liver Model Market by Application: An Overview
- 3.3.2 Global ADME Studies Human Liver Model Market by Value
- 3.3.3 Global Toxicology Testing Human Liver Model Market by Value
- 3.3.4 Global Disease Modeling Human Liver Model Market by Value
- 3.3.5 Global Others Human Liver Model Market by Value

3.4 Global Human Liver Model Market: End-use Analysis

- 3.4.1 Global Human Liver Model Market by End-use: An Overview
- 3.4.2 Global Pharmaceutical & Biotechnology Companies Human Liver Model Market by Value
- 3.4.3 Global Contract Research Organizations Human Liver Model Market by Value
- 3.4.4 Global Academic and Research Institutes Human Liver Model Market by Value

4. REGIONAL MARKET ANALYSIS

4.1 North America Human Liver Model Market: An Analysis

- 4.1.1 North America Human Liver Model Market: An Overview
- 4.1.2 North America Human Liver Model Market by Value
- 4.1.3 North America Human Liver Model Market by Region (The US, Canada and Mexico)
- 4.1.4 The US Human Liver Model Market by Value
- 4.1.5 Canada Human Liver Model Market by Value
- 4.1.6 Mexico Human Liver Model Market by Value

4.2 Europe Human Liver Model Market: An Analysis

- 4.2.1 Europe Human Liver Model Market: An Overview
- 4.2.2 Europe Human Liver Model Market by Value
- 4.2.3 Europe Human Liver Model Market by Region (Germany, UK, France, Italy, Spain and Rest of Europe)
- 4.2.4 Germany Human Liver Model Market by Value
- 4.2.5 United Kingdom Human Liver Model Market by Value
- 4.2.6 France Human Liver Model Market by Value
- 4.2.7 Italy Human Liver Model Market by Value
- 4.2.8 Spain Human Liver Model Market by Value
- 4.2.9 Rest of Europe Human Liver Model Market by Value

4.3 Asia Pacific Human Liver Model Market: An Analysis

- 4.3.1 Asia Pacific Human Liver Model Market: An Overview
- 4.3.2 Asia Pacific Human Liver Model Market by Value
- 4.3.3 Asia Pacific Human Liver Model Market by Region (China, Japan, India, South Korea and Rest of Asia Pacific)

- 4.3.4 China Human Liver Model Market by Value
- 4.3.5 Japan Human Liver Model Market by Value
- 4.3.6 India Human Liver Model Market by Value
- 4.3.7 South Korea Human Liver Model Market by Value
- 4.3.8 Rest of Asia Pacific Human Liver Model Market by Value
- 4.4 Rest of the World Human Liver Model Market: An Analysis
 - 4.4.1 Rest of the World Human Liver Model Market: An Overview
 - 4.4.2 Rest of the World Human Liver Model Market by Value

5. MARKET DYNAMICS

5.1 Growth Drivers

- 5.1.1 Increasing Prevalence of Liver Diseases
- 5.1.2 Growing Demand for Alternatives to Animal Testing
- 5.1.3 Increasing Focus on Personalized Medicine
- 5.1.4 Growing Investment in Liver Research
- 5.1.5 The Growing Need for Early Drug Toxicity Diagnosis

5.2 Challenges

- 5.2.1 High Cost of Liver Models
- 5.2.2 Dearth of Skilled Professionals

5.3 Market Trends

- 5.3.1 Integration of AI and Machine Learning
- 5.3.2 Advancements in Organ Printing and Tissue Engineering Technologies
- 5.3.3 Shift from 2D to Advanced 3D and Ex Vivo Models
- 5.3.4 Rise of Hybrid and In Silico Models

6. COMPETITIVE LANDSCAPE

6.1 Global Human Liver Model Market Players: Competitive Landscape

- 6.1.1 Global Human Liver Model Market Players: An Overview

6.2 Global Human Liver Model Market Players: Recent Developments

7. COMPANY PROFILES

7.1 Corning Incorporated

- 7.1.1 Business Overview
- 7.1.2 Operating Segments
- 7.1.3 Business Strategies

7.2 Organovo Holdings Inc.

- 7.2.1 Business Overview
- 7.2.2 Business Strategies
- 7.3 InSphero AG
 - 7.3.1 Business Overview
 - 7.3.2 Business Strategies
- 7.4 BioIVT LLC
 - 7.4.1 Business Overview
 - 7.4.2 Business Strategies
- 7.5 Emulate Inc.
 - 7.5.1 Business Overview
 - 7.5.2 Business Strategies
- 7.6 MatTek (The BICO Group)
 - 7.6.1 Business Overview
 - 7.6.2 Business Strategies
- 7.7 MIMETAS
 - 7.7.1 Business Overview
 - 7.7.2 Business Strategies
- 7.8 CN Bio Innovations Ltd.
 - 7.8.1 Business Overview
 - 7.8.2 Business Strategies
- 7.9 Cyfuse Biomedical K.K.
 - 7.9.1 Business Overview
 - 7.9.2 Business Strategies
- 7.10 PhoenixBio Co., Ltd.
 - 7.10.1 Business Overview
 - 7.10.2 Business Strategies
- 7.11 STEMCELL Technologies
 - 7.11.1 Business Overview
 - 7.11.2 Business Strategies
- 7.12 Pandorum Technologies Pvt. Ltd.
 - 7.12.1 Business Overview
- 7.13 Kirkstall Ltd.
 - 7.13.1 Business Overview

List Of Figures

LIST OF FIGURES

Figure 1: Benefits of Human Liver Model

Figure 2: Human Liver Model Segmentation

Figure 3: Global Human Liver Model Market by Value; 2020-2024 (US\$ Billion)

Figure 4: Global Human Liver Model Market by Value; 2025-2030 (US\$ Billion)

Figure 5: Global Human Liver Model Market by Product Type; 2024 (Percentage, %)

Figure 6: Global Human Liver Model Market by Application; 2024 (Percentage, %)

Figure 7: Global Human Liver Model Market by End-use; 2024 (Percentage, %)

Figure 8: Global Human Liver Model Market by Region; 2024 (Percentage, %)

Figure 9: Global 2D Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 10: Global 2D Human Liver Model Market by Value; 2025-2030 (US\$ Billion)

Figure 11: Global 2D Human Liver Model Market by Product Type; 2024 (Percentage, %)

Figure 12: Global Cell Lines 2D Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 13: Global Cell Lines 2D Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 14: Global Primary Human Hepatocytes 2D Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 15: Global Primary Human Hepatocytes 2D Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 16: Global 3D Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 17: Global 3D Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 18: Global Human Liver Model Market by Product Type; 2024 (Percentage, %)

Figure 19: Global Liver-on-a-chip 3D Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 20: Global Liver-on-a-chip 3D Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 21: Global Organoids 3D Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 22: Global Organoids 3D Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 23: Global Spheroids 3D Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 24: Global Spheroids 3D Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 25: Global 3D Bio printed Tissues Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 26: Global 3D Bio printed Tissues Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 27: Global ADME Studies Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 28: Global ADME Studies Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 29: Global Toxicology Testing Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 30: Global Toxicology Testing Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 31: Global Disease Modeling Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 32: Global Disease Modeling Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 33: Global Others Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 34: Global Others Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 35: Global Pharmaceutical & Biotechnology Companies Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 36: Global Pharmaceutical & Biotechnology Companies Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 37: Global Contract Research Organizations Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 38: Global Contract Research Organizations Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 39: Global Academic and Research Institutes Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 40: Global Academic and Research Institutes Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 41: North America Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 42: North America Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 43: North America Human Liver Model Market by Region; 2024 (Percentage, %)

Figure 44: The US Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 45: The US Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 46: Canada Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 47: Canada Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 48: Mexico Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 49: Mexico Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 50: Europe Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 51: Europe Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 52: Europe Human Liver Model Market by Region; 2024 (Percentage, %)

Figure 53: Germany Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 54: Germany Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 55: United Kingdom Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 56: United Kingdom Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 57: France Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 58: France Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 59: Italy Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 60: Italy Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 61: Spain Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 62: Spain Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 63: Rest of Europe Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 64: Rest of Europe Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 65: Asia Pacific Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 66: Asia Pacific Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 67: Asia Pacific Human Liver Model Market by Region; 2024 (Percentage, %)

Figure 68: China Human Liver Model Market by Value, 2020-2024 (US\$ Million)

Figure 69: China Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 70: Japan Human Liver Model Market by Value, 2020-2024 (US\$ Million)

Figure 71: Japan Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 72: India Human Liver Model Market by Value, 2020-2024 (US\$ Million)

Figure 73: India Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 74: South Korea Human Liver Model Market by Value, 2020-2024 (US\$ Million)

Figure 75: South Korea Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 76: Rest of Asia Pacific Human Liver Model Market by Value, 2020-2024 (US\$ Million)

Figure 77: Rest of Asia Pacific Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 78: Rest of the World Human Liver Model Market by Value; 2020-2024 (US\$ Million)

Figure 79: Rest of the World Human Liver Model Market by Value; 2025-2030 (US\$ Million)

Figure 80: Global Artificial Intelligence (AI) in Healthcare Market; 2021-2030 (US\$

Billion)

Figure 81: Corning Incorporated Net Sales by Segments; 2024 (Percentage, %)

I would like to order

Product name: Global Human Liver Model Market: 2026 Edition

Product link: <https://marketpublishers.com/r/GA1E34C2751CEN.html>

Price: US\$ 2,250.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/GA1E34C2751CEN.html>