Toxicology Drug Screening - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

The Toxicology Drug Screening Market size is estimated at USD 15.78 billion in 2025, and is expected to reach USD 24.03 billion by 2030, at a CAGR of 8.77% during the forecast period (2025-2030).

The emergence of the COVID-19 pandemic had a significant impact on the market studied. Due to the onset of COVID-19, the need for vaccines and effective treatment development increased. This further increased the extensive use of toxicological screening methods in drug development. According to an article published in the PMC journal in July 2022, various government authorities recommended nonclinical safety studies such as efficacy, biodistribution, and toxicology studies prior to proceeding to First-in-human (FIH) clinical trials for COVID-19 vaccine candidate consisting of a novel product type for which no prior nonclinical and clinical data were available prior. Such instances show that the demand for toxicology testing increased during the pandemic, fueling the market growth, and the studied market is likely to witness growth during the forecast period.

The studied market is driven by three major factors such as increasing research and development (R&D) expenditure, technological advancements in toxicity screening, and rising demand for toxicological drug screening.

Chronic diseases are major factors that are fueling the demand for drug discovery and increase in R&D expenditure. Cancer and heart diseases are the major cause of healthcare burden globally. According to the 2022 update by 'Cancer Research UK,' if the recent trends in the incidence of major cancers and population growth are consistent, the new cancer cases will reach 27.5 million worldwide by 2040. With the rise in disease incidence, the major companies are concentrating on developing new drugs and therapeutics, followed by a demand generation for toxicology drug screenings for the same. Hence, the studied market is expected to witness growth over the forecast period.

The applications of toxicity testing are set to increase with advances in biotechnology and pharmaceuticals, resulting in a demand for the same. Several emerging fields and techniques are providing new insights into understanding biological responses to chemicals in human tissues. Furthermore, there is an increase in pharmaceutical R&D spending globally. According to the IFPMA's 2021 report, the annual R&D spending by the biopharmaceutical industry is 7.3 times higher than that of the aerospace and defense industries, 6.5 times more than the chemicals industry, and 1.5 times more than the software and computer services industry. The source above also mentioned that the biopharmaceutical industry spent USD 196,000 million in 2021, and it is expected to increase to USD 213,000 million by 2024. Thus, the increasing R&D in the biopharmaceutical industry for pharmaceutical product development is garnering the toxicology screening of the drug products, fueling the studied market growth.

Additionally, the recent technological developments by the market players and researchers are contributing to the growth of the market studied. For instance, in April 2022, CN Bio, an organ-on-a-chip (OOC) company, launched PhysioMimix 'in-a-box' reagent kit for non-alcoholic steatohepatitis (NASH), a disease that has no regulatory-approved therapeutics for treatment till date. The NASH-in-a-box (NIAB) kit works in conjunction with CN Bio's PhysioMimix micro-physiological systems (MPS) to provide researchers with in-house capabilities to gain physiologically relevant insights into the mechanism of disease, human drug efficacy, and safety toxicology. Such developments are anticipated to fuel the studied market growth.

Therefore, the increasing R&D activities and the rise in demand for toxicology drug screening in the pharmaceutical and biotechnology industries are expected to contribute to the market growth during the analysis period. However, the long duration of sample testing and stringent government regulations on the toxicological testing of human drug molecules are expected to hinder market growth over the forecast period.

Toxicology Drug Screening Market Trends

In Silico Segment is Expected to Witness Significant Growth Over the Forecast Period

The in-silico segment holds a significant market share in the toxicology drug screening market and is anticipated to show robust growth over the forecast period. In silico methods help identify drug targets via bioinformatics tools. They are also used to analyze the target structures to generate candidate molecules, find possible binding/active sites, check their drug-likeness, and further optimize the molecules to improve their binding characteristics.

The in-silico platform is considered a potential tool in various COVID-19-related research in predicting the immune responses of potential candidate vaccines. The Universal Immune System Simulator (UISS) in silico platform has a strong potential to predict the outcome of a vaccination strategy against the COVID-19 virus. It has been frequently employed in various research to speed up and drive the discovery pipeline of the vaccine. Hence, the segment is expected to show growth.

Drug discovery is currently growing at a rapid pace. There has been an upsurge in the pipeline of novel drugs in recent years. But a handful of them is approved by the FDA. The drug discovery process is being revolutionized by deploying various proteomics, genomics, bioinformatics, and efficient technologies like in silico ADMET screening and structure-based drug design, virtual screening, and de novo design, which help in the detection of drug toxicology. Hence, in silico screening is adopted nowadays to improve the screening safety and efficacy of drugs. For instance, according to a research article published in NLM in March 2022, in silico screening make use of computer modeling and simulation to assess the efficacy and safety of a drug product or a medicinal advanced therapeutic product. Thus, in-silico toxicity screenings provide better efficiency and better knowledge of the safety and efficacy of a drug. Thus, the segment is expected to grow over the analysis period.

North America is Expected to Hold a Major Market Share During the Forecast Period

North America is expected to hold a significant market share in the global toxicology drug screening market. Factors such as growing research and development (R&D) activities in this region to detect toxicity levels in the human body at early stages and the rise in demand for toxicology drug screening in pharmaceuticals and biotechnology in the region are fueling the market growth in the country.

The presence of a well-established pharmaceutical industry in the region, the high R&D expenditure, the strong presence of major service providers, and the growing trend of outsourcing analytical testing by pharmaceutical and biopharmaceutical companies in the region are several major factors that contribute to the overall market growth. For instance, according to the October 2022 update by OECD, pharmaceutical spending in the United States, Canada, and Mexico was 2.08, 1.72, and 1.34 (% of gross domestic product (GDP)), respectively, in 2020. This shows the high involvement of major players and manufacturers, along with government organizations, in product development. This increase in expenditure is primarily driven by the focus on having the edge over their competitors and the high returns gained on newly developed products.

In addition, due to the presence of established market players and the focused R&D of new drugs, the market for clinical trials in the United States has been growing, which is also impacting the toxicology drug screening market positively. According to the January 2022 update by Regulatory Affairs Professionals Society (RAPS), 50 novel drugs were approved by CDER in 2021, among which 38 drugs were approved in the United States. Thus, such investments and drug development activities led to the rapid development of innovative and cost-effective screening, fueling market growth. This is expected to contribute to the market growth in the region.

Toxicology Drug Screening Industry Overview

The toxicology drug screening market is moderately competitive, with the presence of a few key players. Some companies currently dominating the market are Agilent Technologies Inc., Bio-Rad Laboratories Inc., Eurofins Scientific, Danaher, Laboratory Corporation of America Holdings, BioReliance Inc., Thermo Fisher Scientific Inc., and Enzo Life Sciences Inc.

Additional Benefits:

  The market estimate (ME) sheet in Excel format
 3 months of analyst support

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