Toxicology Drug Screening Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 120 pages | Mordor Intelligence

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Report description:

The toxicology drug screening market is expected to register a CAGR of 11.25% during the forecast period (2022-2027).

Due to the current COVID-19 situation and the need to develop vaccines and effective treatment methods, various research laboratories and biopharmaceutical industries have extensively used toxicological screening methods in drug development. According to an article published by the Science Advisory Board in July 2020, researchers are using a strain of SARS-CoV-2 that can infect mice to produce a new mouse model of infection and facilitate several in vivo tests of COVID-19 vaccine candidates and therapies. However, there is a significant decline in non-COVID-19 related research, which is likely to affect the market growth.

In vitro, in vivo, and in silico are the different techniques that are used to assess drug toxicity and confirm the safety of the drug in the drug discovery and development process, i.e., clinical and pre-clinical trials. Toxicity testing has become well-developed due to various advanced technologies aiding the process, and it is currently anticipated to take advantage of promising revolutions in the fields of biotechnology and pharmaceuticals.

The studied market is driven by three major factors: increasing research and development expenditure, technological advancements in toxicity screening, and rising demand for toxicological drug screening. In 2019, Roche incurred an R&D expense of CHF 11.7 billion, while Johnson & Johnson invested USD 11.36 billion in R&D. Additionally, the recent technological developments by the market players and researchers are contributing to the growth of the market studied. For instance, in the research study published in Biofabrication in 2020, a primary human cell- and stem cell-derived 3D organoid technology was employed to screen a panel of drugs that were recalled from the market by the US FDA. The platform comprises multiple tissue organoid types that remain viable for at least 28 days in vitro. Earlier, in August 2019, Covance launched a laboratory solution within its functional service provider (FSPx) offering, which expanded the capabilities of its clinical analytics services and clinical

operations.

The rising prevalence of various diseases is also fueling the market demand for different toxicological screening procedures. This is because the rise in disease incidence prompts companies to develop new therapeutics. As per the World Health Organization (WHO), the burden of chronic diseases is increasing. It has been observed that almost half of the total chronic disease deaths are attributable to cardiovascular diseases, obesity, and diabetes, which are showing increasing trends. The WHO 2019 Report stated that chronic diseases kill 41 million people yearly, equivalent to 71% of all deaths globally.

Cancer is the second leading cause of death globally. It was responsible for an estimated 10 million deaths in 2020, per the WHO report for 2021. Globally, about 1 in 6 deaths was due to cancer. In addition, approximately 70% of deaths from cancer occur in low- and middle-income countries. Cancer Research UK also predicted that if the recent trends in incidence of major cancers and population growth are consistent, there may be 27.5 million new cancer cases worldwide each year by 2040. Thus, the rising burden of these diseases is expected to fuel market growth.

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. In 2020, the global spending on R&D reached a record high of almost USD 1.7 trillion, according to the UNESCO Institute for Statistics. The key drivers for market growth are the increasing R&D activities, the technological advancements in toxicology drug screening, and the rise in demand for toxicology drug screening in the pharmaceutical and biotechnology industries. 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 Expected to Register Robust Growth

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.

As per the 2019 estimates of the US Food and Drug Administration (FDA), pipeline drugs experienced a growth rate of 6%, compared to 2.7% in 2018. Currently, the drug discovery process is being revolutionized by the deployment of 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.

The increasing research and development activities, technological advancements in drug screening, and rise in demand for toxicology drug screening in the pharmaceutical and biotechnology industries are the key driving factors of the in-silico segment.

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 researches to speed up and drive the discovery pipeline of the vaccine. Hence, the segment is expected to show positive growth during the forecast period.

North America Expected to Hold Significant Market Share

North America is expected to hold a significant market share in the global toxicology drug screening market due to the growing research and development activities in this region to detect toxicity levels in the human body at early stages. The research and development in this region reached a plateau, as these trials are being outsourced to other regions, like Asia. However, the increasing R&D investments and rising demand for drug development are the major factors driving the market growth. The pharmaceutical companies in North America spend more money, time, and energy on R&D than most other pharmaceutical companies in other regions. According to an article published by the National Center for Science and Engineering Statistics (2020), the 42 federally funded research and development centers (FFRDCs) in the United States spent USD 23.5 billion on research and development in FY 2020, recording an annual increase of 3.4%. 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.

Also, the R&D budgets of the pharmaceutical companies have increased in the past few years, owing to the rising burden of diseases, complex molecules, and therapy segments. According to the data from the Pharmaceutical Research and Manufacturers of America (2019), the research and development expenditure of the US pharmaceutical industry increased from 15.2 billion in 1995 to 79.6 billion in 2018.

Moreover, 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 Biotechnology Innovation Organization, in 2019, around 50 novel drugs were approved by the Center for Drug Evaluation and Research (CDER). Furthermore, technical advancements and supportive government regulations have led to the rapid development of innovative and cost-effective testing. The presence of a well-established healthcare infrastructure is also fueling the growth of the market.

Toxicology Drug Screening Market Competitor Analysis

The toxicology drug screening market is consolidated and 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.

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