

United States Life Science Tools Market Assessment, By Type [Instruments, Consumables, Services], By **Technology** [Genomics, Proteomics, Cell Biology Technology, Lab Supplies, Others], By Product [Cell **Culture Systems & 3D Cell Culture, Liquid** Chromatography, Mass Spectrometry, Flow Cytometry, Cloning & Genome Engineering, Microscopy, Next Generation Sequencing, PCR & **qPCR**, Nucleic Acid Preparation, Nucleic Acid Microarray, Sanger Sequencing, Transfection Device & Gene Delivery Technologies, Nuclear Magnetic Resonance, Others], By End-user [Healthcare, **Government & Academic Institutions**, **Biopharmaceutical Company, Industrial Applications, Others], By Region, Opportunities and Forecast,** 2016-2030F

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Abstracts

United States Life Science Tools market size was valued at USD 25.81 billion in 2022 which is expected to reach USD 46.96 billion in 2030 with a CAGR of 7.77% for the forecast period between 2023 and 2030. The life science tools market is experiencing substantial growth due to the increasing adoption of life sciences techniques, increasing geriatric patients, growing prevalence of chronic diseases, rapid technological



advancements in sequencing technologies, mass spectrometry, Nuclear Magnetic Resonance (NMR), etc.

Companies are investing significantly in the research and development of life science tools and services, fostering innovation and novel technologies. Moreover, the market is being fueled by an increasing number of strategic deals and developments, as well as a growing number of acquisitions in the field of life sciences and biopharmaceuticals. Earlier, only a limited number of companies had the necessary infrastructure to manage every aspect of the biological production value chain. However, the industry has undergone a transformation, and today there are numerous firms engaged in the development of biologics, making substantial contributions to the expansion of the market.

As per Pharmaceutical Research and Manufacturers Association (PhRMA), United States holds the largest share of the biopharmaceuticals market, representing one-third of its total. The United States is renowned for being a global leader in biopharmaceutical research and development (R&D). Additionally, it boasts a highly favorable domestic environment that encourages and supports the research, development, and commercialization of pharmaceuticals with minimal market obstacles. Consequently, the utilization of spectroscopic techniques in drug discovery and development is projected to increase in the United States in the coming years.

Spectroscopy is Experiencing a Surge in Popularity

The United States life sciences tools market stands out as a global leader with minimal market barriers due to its highly supportive domestic environment for pharmaceutical research, development, and commercialization. The utilization of spectroscopic techniques in drug discovery and development is anticipated to increase in the United States in the coming years. Spectroscopy offers several clinical benefits in healthcare such as accurate diagnostics, non-invasive monitoring, therapeutic drug monitoring, point-of-care testing, cancer detection and treatment. These clinical benefits contribute to improved patient care, personalized medicine, and enhanced treatment outcomes.

In January 2021, Bruker, a prominent provider of scientific instruments and analytical solutions, revealed its partnership with numares AG, a renowned company specializing in metabolomics-based diagnostics. The collaboration aims to jointly develop and introduce novel diagnostic tests that utilize nuclear magnetic resonance (NMR) spectroscopy technology to address unmet medical needs in the laboratory market.



Cell Biology Technology is Dominating the Technology Segment

The steady growth of the cell biology segment can be attributed to its significance in drug discovery and the funding provided by National Institute of Health (NIH) for cell biology research. Advancements in liquid handling and flow cytometry have played a crucial role in expanding the applications of cell-based assays in drug discovery. These technological advancements have enabled researchers to utilize cell-based assays effectively, providing a practical alternative to pre-clinical animal models that often result in late-stage failures. Cell-based assays can predict the in vivo activities of novel drug candidates, enhancing the efficiency and accuracy of drug discovery processes.

In May 2023, Deepcell, a software company specializing in single cell dimension morphology analysis, introduced an AI-driven platform for single cell analysis. This platform aims to expedite advancements in cell biology discovery. Deepcell showcased its research at the CYTO 2023 conference.

Integration of Artificial Intelligence & Machine Learning in Life Sciences

The growing maturity and progress of artificial intelligence (AI) are poised to significantly influence the life sciences sector. AI relies on complex algorithms that have the ability to make decisions and address complex problems. When AI and machine learning (ML) is combined with life sciences, it allows companies to accelerate the development of treatments in a more efficient manner. These advancements help in reducing healthcare costs and enhance accessibility for patients. AI and ML have the potential to assist companies in transforming their business models, optimizing biopharmaceutical manufacturing processes, and improving various aspects ranging from cognitive research on molecules to the flow of clinical trial data. Additionally, these technologies can be utilized to develop self-healing supply chain applications and enhance product intelligence.

In November 2022, Mayo Clinic and Numares Health announced their partnership for incorporating AI to aid in diagnostic testing for patients with chronic diseases. As per the agreement, the two companies collaborated on the creation of clinical diagnostic tests that utilize nuclear magnetic resonance (NMR) technology to measure groups of risk factors rather than individual biomarkers. The primary focus of the partnership encompassed cardiovascular disease, kidney disease, liver cancer, and several other related conditions.

Growing Investments in Research and Development



The biopharmaceutical sector in the United States has witnessed notable growth, encompassing novel product categories like synthetic vaccines, nanoantibodies, rDNA, fusion proteins, immunoconjugates, soluble receptors, and immunotherapeutics. The increased research and development (R&D) investment by the pharmaceutical and biopharmaceutical industries in life science tools, research, and academic pursuits is anticipated to propel market growth. Private capital funding has propelled the expansion of the life sciences industry in the last 10 years, with substantial financial investments contributing to its growth. Despite the challenges faced in the funding landscape during 2022, securing billion-dollar investments was not a problem for biopharmaceutical companies.

For instance, the United States holds a prominent position as a global leader in new drug development, as stated by the Pharmaceutical Research and Manufacturers of America (PhRMA). In 2021, the combined biopharmaceutical and pharmaceutical industry invested an estimated USD 91.1 billion in research and development (R&D), surpassing the approximately USD 83 billion invested in R&D the previous year.

Technological Advancements

Technological advancements in life sciences tools have been driving significant progress in various areas of research and development. The country has witnessed substantial innovation and development in fields such as genomics, proteomics, imaging technologies, automation and analytics. In genomics, the advent of next-generation sequencing (NGS) has revolutionized the field by enabling faster, more cost-effective DNA sequencing. This has paved the way for large-scale genomic studies, personalized medicine, and precision therapeutics. Proteomics has also seen significant advancements, with the development of high-throughput mass spectrometry platforms that allow for comprehensive protein analysis and characterization. These advancements have contributed to a better understanding of disease mechanisms and the identification of potential therapeutic targets.

For example, Thermo Fisher Scientific obtained premarket approval from FDA for its companion diagnostic, designed to assist in identifying patients with non-small cell lung cancer whose tumors bear the epidermal growth factor receptor. This test is the first and sole FDA-approved next-generation sequencing (NGS) companion diagnostic (CDx) for formalin-fixed, paraffin-embedded (FFPE) tissue. It is utilized to determine eligibility for RYBREVANT treatment in patients whose condition has worsened following platinum-based chemotherapy.



Impact of COVID-19

The COVID-19 pandemic has had a significant impact on life science tools industry and their respective supply chains in the United States. This disruption can be attributed to several factors, including the scarcity of raw materials and labor, as well as interruptions in the transportation of these materials across regions. As a result, there has been a shortage of critical medical supplies, including molecular and immunoassay kits, digital solutions, life-support machines, and drugs. Numerous life sciences companies were engaging in collaborations to create remedies for COVID-19. Biopharmaceutical companies had prioritized vaccines and treatments in their product pipeline during the pandemic.

Additionally, the pandemic had a favorable impact on the market due to the intensified competition to develop rapid diagnostics for the SARS-CoV-2 virus. These tests comprised of various techniques such as PCR, nucleic acid hybridization, serological assays, and immunological assays to detect the presence of the virus or the antibodies produced in response to it. For instance, in December 2021, Siemens Healthineers obtained emergency use authorization from the U.S. FDA for its CLINITEST Rapid COVID-19 antigen self-test, a self-testing option for individuals aged 14 and above.

Key Players Landscape and Outlook

The United States life sciences tools market has witnessed substantial growth, encompassing emerging product categories such as synthetic vaccines, nanoantibodies, rDNA, fusion proteins, immunoconjugates, soluble receptors, and immunotherapeutics. This expansion has been accompanied by research and development (R&D), investments by pharmaceutical and biopharmaceutical companies in life science tools, research, and academic collaborations. These investments are anticipated to propel the market forward.

Furthermore, there will be increased investment in genomics research, leading to a higher utilization of NGS-based devices and fostering market expansion. A notable illustration is an announcement made by the National Institutes of Health (NIH) in May 2022, stating that spending on cancer genomics in the United States is expected to increase from USD 1,160 million in 2021 to USD 1,220 million in 2022.



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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work

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