

Robotic Arms In Laboratories - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

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Report description:

The Robotic Arms in Laboratories Market was valued at USD 5.3 billion in the previous year and is expected to grow at a CAGR of 11.5% during the forecast period to reach USD 10.18 billion by the next five years. Robotic arms are rapidly being used in research laboratories for applications that need flexibility, effective space use, and seamless integration of lab peripherals. With the simplicity with which the arms may be programmed, the adoption has expanded over time. Preparing samples, running analytical equipment, and handling sample material are typical duties these robots do. As a result, lab automation is the primary driver of laboratory robotic arm use.

Key Highlights

- Robotic arms are widely used in assay development, cell biology, bioassay validation, DNA quantification, PCR setup, and cleanup. These are optimized for handling standard labware, like microplates, reservoirs, and disposable tip racks. These are also helpful for loading and unloading microplate-based lab instruments, such as readers, washers, and reagent dispensers. Further, biomedical research has employed robotic arms primarily to process samples. Their influence in the drug discovery process remained limited, which explains why the development, testing, and commercialization process takes 15 to 20 years on average. Recent improvements in laboratory automation and robotics, particularly in AI and ML, have created a new frontier in life science and pharmaceutical. Tasks can now be completed at rates and precision that exceed human competence.
- For instance, the FDA's Center for Drug Evaluation and Research (CDER) recently approved 50 brand-new pharmaceutical and biological products. 33 of the 50 novel medications and biological products approved for usage had tiny molecules, while 17 were monoclonal antibodies and other large molecules. However, the number of biological approvals has constantly risen during the past few years. Such huge approvals for drugs will drive the studied market.
- Furthermore, due to its apparent benefits, including stability, high precision, repeatability, many degrees of freedom, mobility, and remote control, collaborative robotic arms have been used with medical imaging and operations for a while. In many surgical

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procedures, robotic surgery is now a reality. According to National Health Service (United Kingdom), 43.3 million imaging tests were reported between April 2021 and March 2022 in England. 3.67 million imaging tests were said to have been performed in March 2022. The most prevalent type of imaging in March 2022 was plain radiography (X-rays), with 1.82 million cases, followed by diagnostic ultrasound (0.85 million), computerized axial tomography (CT-scan), and magnetic resonance imaging (0.56 million). -Moreover, more tests are being sent to the lab due to a higher number of patients and an increasing number of tests available. However, the need for more staff to process these samples leaves medical facilities needing help. According to the Bureau of Labor Statistics, the demand for lab workers is growing. For instance, the American Association of Medical Colleges (AAMC) predicted that by 2030 there would be a shortage of 42,600 and 121,300 clinicians by the end of the following decade. This would drive the demand for the studied market.

-Moreover, there has been increased pressure on the laboratories to increase testing labs capacity and speed even in Post-COVID. With the increase in the number of samples being tested every day, the market studied has been witnessing a growth in the developments of automation systems by vendors, which creates opportunities for the studied market growth. For instance, a robotic arm known as "AutoVac" was announced to be capable of extracting roughly 12 doses of the AstraZeneca vaccine from a single vial in under four minutes. A team of researchers at Thailand's Chulalongkorn University created this device. Typically, a medical expert can manually dispense up to 10 dosages from a single vial. Compared to the norm, this robotic arm can increase production by around 20%. The device accurately promises 20% of doses (between 10 and 12) from each vaccination vial. -Furthermore, the Russia-Ukraine war is impacting the supply chain of electronic components. The dispute has disrupted the supply chain, causing shortages and price increases for raw materials, affecting robotic arms manufacturers and potentially leading to higher costs for end-users.

Robotic Arms In Laboratories Market Trends

Genomics and Proteomics Application is Expected to Hold Significant Market Share

- Genomics refers to the study of whole genomes of organisms while incorporating elements from genetics. Scientists always look for improved accuracy, higher throughput, and reduced cost during advanced gene sequencing. Though most labs lack access, automation has often delivered all these.

- With the technological advancements, increasing investments in clinical research, and computational capacities over the past few years, there has been significant improvement in knowledge of genome sequencing in terms of data analytics advances that show unknown correlations, hidden patterns, and other insights, specifically when testing data sets on a large scale. Moreover, novel medical advances are being made rapidly, mainly due to recent developments in genome analysis. DNA sequence analysis provides a clearer understanding of how genetic variation leads to disease and, thus, will lead to new cures. According to NIH, clinical research funding by the National Institute of Health was USD 18 billion.

- Furthermore, laboratory automation has made room for great flexibility, higher throughputs, and affordable solutions. It offers faster handling, and the process can be expedited without worrying about a lack of reliability and precision. Genotyping and DNA sequencing have been affordable, and the growth rate is robust. Some instruments can automate nearly every step of the large-scale sequencing process: isolating DNA, cloning or amplifying DNA, preparing enzymatic sequencing reactions, purifying DNA, and separating and detecting DNA fragments with fluorescent labels to obtain DNA sequences.

- Although genomics has the potential to increase medicine efficacy and speed up precision healthcare, one of the most promising areas is the introduction of genetic testing into clinical trials. With breakthroughs in science and growing awareness of the effect of genomics, there is a need and an opportunity to maximize the value of the gathered samples and the data generated from them. As a result, obtaining genetic samples is extensively urged at all phases and studies of clinical development.

- In April 2022, INSACOG (Indian SARS-CoV-2 Consortium on Genomics), a group of 38 genome sequencing institutes in India, published a report in which it was estimated that India sequenced 89,860 samples between January and April. There are now 240,570 sequenced samples in total. Only 0.397 percent of India's total cases have been sequenced. According to the most recent

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data from the Global Initiative on Sharing Avian Influenza Data (GISAID), the world's most extensive database of new coronavirus genome sequences, this is the case. Using genomics will enable the identification of the pattern of the virus and prevent future mutation spread. The increasing need for Genomics & Proteomics is anticipated to be a lucrative opportunity for the studied market's growth.

- Furthermore, nucleic acid isolation, RNAi screening, CRISPR analysis, PCR, and gene expression analysis are just a few of the genomics applications that use automation. Laboratory automation players/vendors are developing tools to meet these application requirements. Tecan Group, for example, recently introduced their new "Fluent Automation Workstation" platform, which incorporates various capabilities to simplify day-to-day laboratory automation and increase workflow productivity. The technique reacts dynamically during a run, making adjustments based on actual times to maintain continuous optimal throughput, visible in real time via an easy-to-understand Gantt chart.

North America is Expected to Hold the Significant Market Share

- The United States has been a pioneer in clinical research for years. This country is home to major pharmaceutical companies, like Pfizer, Novartis, GlaxoSmithKline, J&J, and Novartis. The government also has the highest concentration of contract research organizations (CROs). Some of the significant CROs in the country are Laboratory Corp. of America Holdings, IQVIA, SyneosHealth, and Parexel International Corp.

- Owing to the presence of all the major players in the industry and stringent FDA regulations, the market is very competitive in the country. Companies in the country are increasingly adopting robotics and automation in labs to gain an advantage over competitors.

- In February 2022, Auris Health and Kinova agreed to a five-year contract extension. In accordance with the deal, Kinova would keep assisting Auris in growing its Monarch Platform, which is intended for robotic-assisted surgery. An option to prolong the relationship for a further three years is part of the agreement. To define and create a purpose-built robotic arm to support substantial advancement in surgery, the team at Auris collaborated with Kinova, a Canadian business specializing in robotic arms. The Monarch Platform is intended for therapeutic and diagnostic bronchoscopic operations.

- In addition, Duke University engineers and ophthalmologists recently created robotic imaging equipment that can automatically identify and scan a patient's eyes for signs of various eye illnesses. The new device, which combines a robotic arm and an imaging scanner, can automatically track and picture a patient's eyes in less than a minute and generate images as clear as those from conventional scanners used in specialized eye clinics. Such expansion of innovative products in the country may further drive the studied market growth.

- In addition, the country has the most significant number of contract research organizations (CROs). Syneos Health, IQVIA, Laboratory Corp. of America Holdings, and Parexel International Corp. are among the country's largest CROs. The market in the nation is exceptionally competitive, thanks to the presence of all of the main competitors in the business and strict FDA rules. Companies in the country are rapidly using robots and automation in labs to get a competitive advantage over competitors. According to ClinicalTrials.gov, incorporating robots and automation has been a critical component assisting the development of the clinical research sector, with more than 129,005 clinical trials filed in the United States recently. Furthermore, due to the growing adoption of robots and automation, there has been a considerable increase in FDA approvals in recent years.

Robotic Arms In Laboratories Industry Overview

The Robotic Arms in Laboratories is moderately fragmented with the presence of major players like Thermo Fisher Scientific Inc., Hamilton Company, Hudson Robotics, Inc., Tecan Group, and Anton Paar GmbH. Players in the market are adopting strategies such as partnerships and acquisitions to enhance their product offerings and gain sustainable competitive advantage.

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- March 2022- Robot arms will help with cancer procedures in Wales. The hospital's initial equipment is part of plans to create an all-Wales robotic-assisted surgery network, with more technology to be rolled out across the county. The NHS will use robotic arms to treat some prostate and gynecological cancers and surgeries on the digestive system, kidneys, and bladder.
- February 2022- Automata expanded its lab automation ambitions with USD 50 million. Due to the growing biotech and drug development sectors, the company started making a robotic arm for handling individual tasks, tests, and processing materials.

Additional Benefits:

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

Table of Contents:

1 INTRODUCTION

- 1.1 Study Assumptions and Market Definition
- 1.2 Scope of the Study

2 RESEARCH METHODOLOGY

3 EXECUTIVE SUMMARY

4 MARKET INSIGHTS

- 4.1 Market Overview
- 4.2 Value Chain Analysis
- 4.3 Industry Attractiveness - Porter's Five Forces Analysis
 - 4.3.1 Threat of New Entrants
 - 4.3.2 Bargaining Power of Buyers
 - 4.3.3 Bargaining Power of Suppliers
 - 4.3.4 Threat of Substitute Products
 - 4.3.5 Intensity of Competitive Rivalry
- 4.4 Assessment of Impact of Macroeconomic Trends on the Market

5 MARKET DYNAMICS

- 5.1 Market Drivers
 - 5.1.1 Growing Trend of Lab automation
 - 5.1.2 Increasing Focus Towards Work-safety in Laboratories
- 5.2 Market Restraints
 - 5.2.1 Expensive Initial Setup

6 MARKET SEGMENTATION

- 6.1 By Type
 - 6.1.1 Articulated Arm
 - 6.1.2 Dual Arm
 - 6.1.3 Parallel Link Arm
 - 6.1.4 Others
- 6.2 By Application

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- 6.2.1 Drug Discovery
- 6.2.2 Digital Imaging
- 6.2.3 Genomics & Proteomics
- 6.2.4 Clinical Diagnostics,
- 6.2.5 System Biology
- 6.2.6 Others
- 6.3 By Geography
 - 6.3.1 North America
 - 6.3.2 Europe
 - 6.3.3 Asia Pacific
 - 6.3.4 Rest of the World

7 COMPETITIVE LANDSCAPE

- 7.1 Company Profiles
 - 7.1.1 Thermo Fisher Scientific Inc.
 - 7.1.2 Hamilton Company
 - 7.1.3 Hudson Robotics, Inc.
 - 7.1.4 Tecan Group
 - 7.1.5 Anton Paar GmbH
 - 7.1.6 Biomérieux SA
 - 7.1.7 Siemens Healthineers AG
 - 7.1.8 Beckman Coulter Inc.
 - 7.1.9 PerkinElmer Inc.
 - 7.1.10 QIAGEN NV
 - 7.1.11 Abbott Laboratories

8 INVESTMENT ANALYSIS

9 FUTURE OF THE MARKET

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