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Gene Editing Market Size and Forecasts (2020 - 2030), Global and Regional Share, Trends, and Growth Opportunity Analysis Report Coverage: By Component (Reagents and Consumables, Software and Systems, and Services), Technology (Clustered Regularly Interspaced Short Palindromic Repeats, Transcription Activator-Like Effector Nucleases, Zinc Finger Nucleases, and Other Technologies), Application (Genetic Engineering and Clinical Applications), End User (Pharmaceutical companies and Biotechnology Companies, Academics and Government Research Institutes, and Clinical Research Organizations), and Geography (North America, Europe, Asia Pacific, Middle East & Africa, and South & Central America)

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Abstracts

The gene editing market size is expected to grow from US$ 6.542 billion in 2022 to US$ 23.902 billion by 2030; it is estimated to record a CAGR of 17.6% during 2022-2030.

The growth of the gene editing market is attributed to the increase in cancer and other genetic disorders and growing investment in genetic research. However, the high cost of genomic equipment hinders the market growth.

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Personalized medicine is the field that utilizes patients' genetic and environmental data to deliver optimal healthcare. It is based on the principle that every patient is unique and requires individualistic pharmacological treatment. Since it is a rapidly evolving area, it is presently incorporated into several healthcare systems. The ability to make precise changes in the genome opens new possibilities for developing targeted therapies and personalized medicine. Gene editing is crucial in personalized medicine by tailoring medical treatments to individual patients based on their genetic information. It offers various applications in the field. Firstly, gene editing techniques like CRISPR-Cas9 enable the correction or modification of specific genes associated with genetic disorders, potentially providing treatments or cures for conditions such as cystic fibrosis and other genetic disorders. Secondly, gene editing aids in pharmacogenomics, allowing researchers to study how an individual’s genetic variation impacts their medication response. This knowledge helps in developing personalized treatment plans and optimizing drug dosage.

Gene editing has also shown promise in personalized cancer therapy, where immune cells can be edited to better target and destroy cancer cells. Furthermore, gene editing can contribute to preventing and treating infectious diseases by enhancing immune cell recognition and modifying pathogens. It also facilitates disease modeling and drug development by creating accurate disease models, enabling researchers to understand diseases better and develop personalized treatment approaches. These applications demonstrate the potential of gene editing in advancing personalized medicine, enabling tailored treatments specific to an individual genetic profile. Gene editing in personalized medicine is still advancing, and further research and clinical trials are needed to ensure safety and efficacy.

The growing need for personalized medicine is one of the main factors propelling the growth of the gene editing market. Gene editing technology makes customized therapies and treatments based on an individual's genetic composition possible. In July 2021, the US FDA authorized one patient to receive a tailored CRISPR-based gene therapy for their mutation. The Boston non-profit Cure Rare Disease initiated the clinical trial, which marked numerous milestones, including the first-ever personalized CRISPR therapy and the first clinical trial to implement any form of gene editing for muscular dystrophy treatment.

Increased patient well-being, fewer adverse effects, and better treatment outcomes are all possible with this personalized approach to medicine. The demand for targeted therapeutics and the increasing understanding of personalized medicine have been major factors in the uptake and development of gene editing technology. The growing

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number of gene therapy candidates in the development pipeline highlights the potential for transformative breakthroughs in personalized medicine and treating previously incurable diseases, favoring market growth.

The cost of production is determined by the packages of genome editing for different applications offered by different players. The costs associated with gene editing equipment can be substantial. Gene editing technologies like CRISPR-Cas9 require specialized laboratory equipment, including DNA sequencers, thermal cyclers, fluorescence microscopes, and electroporation devices. These instruments have a high price tag, ranging from thousands to millions of dollars. The US Food and Drug Administration (FDA) has authorized four gene treatments. Kymriah and Yescarta are two chimeric antigen receptor (CAR T-cell) treatments. Yescarta costs US$ 373,000 in the market, whereas Kymriah costs between US$ 373,000 and US$ 475,000, depending on the kind of cancer. The FDA licensed Luxturna in 2017 to treat a rare kind of inherited blindness that affects 1,000 to 2,000 people in the US. The cost of this procedure is US$ 425,000 per eye. Zolgensma was licensed in 2020 to treat a rare childhood condition called spinal muscular atrophy in children under the age of two. Per patient, a single intravenous injection costs US$ 2.1 million. The cost of production is increased based on the procedures added during the production.

In addition, additional challenges and costs are associated with the validation and evaluation of genome editing methods. If the validation shows negative results, repetitive procedures are performed, and hundreds and thousands of dollars are spent on the same procedures. Thus, out of the total cost incurred in the production of genome editing, two-thirds is spent on validation. Hence, the cost of production is among the primary factors restraining the market’s growth.

Components-Based Insights

Based on components, the gene editing market is segmented into reagents and consumables, software and systems, and services. The services segment dominated with the largest share of the market in 2022. However, the reagents and consumables segment is anticipated to register the highest CAGR from 2022 to 2030.

The International Agency for Research on Cancer and the World Health Organization (WHO) are among the primary and secondary sources referred to while preparing the gene editing market report.

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Contents

1. INTRODUCTION

1.1 Scope of the Study
1.2 Market Definition, Assumptions and Limitations
1.3 Market Segmentation

2. EXECUTIVE SUMMARY

2.1 Key Insights
2.2 Market Attractiveness Analysis

3. RESEARCH METHODOLOGY

4. GENE EDITING MARKET LANDSCAPE

4.1 Overview
4.2 PEST Analysis
4.3 Ecosystem Analysis
  4.3.1 List of Vendors in the Value Chain

5. GENE EDITING MARKET - KEY MARKET DYNAMICS

5.1 Key Market Drivers
5.2 Key Market Restraints
5.3 Key Market Opportunities
5.4 Future Trends
5.5 Impact Analysis of Drivers and Restraints

6. GENE EDITING MARKET - GLOBAL MARKET ANALYSIS

6.1 Gene Editing - Global Market Overview
6.2 Gene Editing - Global Market and Forecast to 2030

7. GENE EDITING MARKET – REVENUE ANALYSIS (USD MILLION) – BY TECHNOLOGY, 2020-2030

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7.1 Overview
7.2 Clustered Regularly Interspaced Short Palindromic Repeats
7.3 Transcription Activator-Like Effector Nucleases
7.4 Zinc Finger Nucleases
7.5 Other Technologies

8. GENE EDITING MARKET – REVENUE ANALYSIS (USD MILLION) – BY COMPONENT, 2020-2030

8.1 Overview
8.2 Reagents and Consumables
8.3 Software and Systems
8.4 Services

9. GENE EDITING MARKET – REVENUE ANALYSIS (USD MILLION) – BY APPLICATION, 2020-2030

9.1 Overview
9.2 Clinical Applications
9.3 Genetic Engineering

10. GENE EDITING MARKET – REVENUE ANALYSIS (USD MILLION) – BY END USER, 2020-2030

10.1 Overview
10.2 Pharmaceutical Companies and Biotechnology Companies
10.3 Academics and Government Research Institutes
10.4 Clinical Research Organizations

11. GENE EDITING MARKET - REVENUE ANALYSIS (USD MILLION), 2020-2030 – GEOGRAPHICAL ANALYSIS

11.1 North America
  11.1.1 North America Gene Editing Market Overview
  11.1.2 North America Gene Editing Market Revenue and Forecasts to 2030
  11.1.3 North America Gene Editing Market Revenue and Forecasts and Analysis - By Technology
  11.1.4 North America Gene Editing Market Revenue and Forecasts and Analysis - By Component

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11.1.5 North America Gene Editing Market Revenue and Forecasts and Analysis - By Application
11.1.6 North America Gene Editing Market Revenue and Forecasts and Analysis - By End User
11.1.7 North America Gene Editing Market Revenue and Forecasts and Analysis - By Countries
11.1.7.1 United States Gene Editing Market
11.1.7.1.1 United States Gene Editing Market, by Technology
11.1.7.1.2 United States Gene Editing Market, by Component
11.1.7.1.3 United States Gene Editing Market, by Application
11.1.7.1.4 United States Gene Editing Market, by End User
11.1.7.2 Canada Gene Editing Market
11.1.7.2.1 Canada Gene Editing Market, by Technology
11.1.7.2.2 Canada Gene Editing Market, by Component
11.1.7.2.3 Canada Gene Editing Market, by Application
11.1.7.2.4 Canada Gene Editing Market, by End User
11.1.7.3 Mexico Gene Editing Market
11.1.7.3.1 Mexico Gene Editing Market, by Technology
11.1.7.3.2 Mexico Gene Editing Market, by Component
11.1.7.3.3 Mexico Gene Editing Market, by Application
11.1.7.3.4 Mexico Gene Editing Market, by End User
Note - Similar analysis would be provided for below mentioned regions/countries
11.2 Europe
11.2.1 Germany
11.2.2 France
11.2.3 Italy
11.2.4 Spain
11.2.5 United Kingdom
11.2.6 Rest of Europe
11.3 Asia-Pacific
11.3.1 Australia
11.3.2 China
11.3.3 India
11.3.4 Japan
11.3.5 South Korea
11.3.6 Rest of Asia-Pacific
11.4 Middle East and Africa
11.4.1 South Africa
11.4.2 Saudi Arabia

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11.4.3 U.A.E
11.4.4 Rest of Middle East and Africa
11.5 South and Central America
11.5.1 Brazil
11.5.2 Argentina
11.5.3 Rest of South and Central America

12. INDUSTRY LANDSCAPE

12.1 Mergers and Acquisitions
12.2 Agreements, Collaborations, Joint Ventures
12.3 New Product Launches
12.4 Expansions and Other Strategic Developments

13. COMPETITIVE LANDSCAPE

13.1 Heat Map Analysis by Key Players
13.2 Company Positioning and Concentration

14. GENE EDITING MARKET - KEY COMPANY PROFILES

14.1 Thermo Fisher Scientific Inc.
14.1.1 Key Facts
14.1.2 Business Description
14.1.3 Products and Services
14.1.4 Financial Overview
14.1.5 SWOT Analysis
14.1.6 Key Developments
Note - Similar information would be provided for below list of companies
14.2 Merck KGaA
14.3 Lonza
14.4 GenScript
14.5 CRISPR Therapeutics
14.6 PerkinElmer Inc.
14.7 Agilent Technologies
14.8 Precision BioSciences
14.9 Sangamo Therapeutics Inc.
14.10 New England Biolabs
14.11 Novartis

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15. APPENDIX

15.1 Glossary
15.2 About The Insight Partners
15.3 Market Intelligence Cloud

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