

# **Saudi Arabia Gene Therapy Market By Type (Gene Augmentation, Gene Silencing, Others), By Application (Oncological Diseases, Genetic Diseases, Cardiovascular Diseases, Neuromuscular Diseases, Hematological Diseases, Infectious Diseases, Others), By Region and Competition, Forecast & Opportunities, 2020-2030F**

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## **Abstracts**

Saudi Arabia Gene Therapy Market was valued at USD 60.26 Million in 2024 and is expected to reach USD 76.91 Million by 2030 with a CAGR of 4.35% during the forecast period. Saudi Arabia has a high prevalence of genetic disorders, particularly due to consanguinity, where close relatives marry. Conditions such as thalassemia, sickle cell anemia, and cystic fibrosis are more common in the region compared to global averages. The growing burden of these genetic diseases has created a demand for innovative treatments, with gene therapy offering potential cures or management options. As awareness of gene therapy increases, healthcare providers and patients are more inclined to explore these advanced treatment options.

The field of gene therapy has experienced significant technological breakthroughs over the past decade, making it more feasible and effective for treating a range of genetic diseases. Innovations in gene editing technologies, such as CRISPR-Cas9, and the development of more efficient delivery systems for gene-based therapies have paved the way for the commercialization of these treatments. As these advancements continue to progress, the accessibility and affordability of gene therapies in Saudi Arabia are expected to improve, driving market growth.

Despite the promising growth prospects, several challenges hinder the widespread

adoption of gene therapies in Saudi Arabia. One of the primary obstacles is the high cost of these treatments. Gene therapies, particularly those targeting rare genetic disorders, often come with significant financial burdens, making them less accessible to a large portion of the population. While the government is making strides in expanding healthcare access, the cost of cutting-edge treatments remains a barrier, especially for individuals without comprehensive insurance coverage.

## Key Market Drivers

### Growth in Healthcare Industry

The growth of the healthcare industry in Saudi Arabia is a significant driver of the country's expanding gene therapy market. Saudi Arabia's health legislation is designed to ensure equitable and accessible healthcare for all citizens. Represented by the Ministry of Health (MoH), the country offers a comprehensive network of healthcare services across all regions. Healthcare in government facilities is provided free of charge to citizens, guided by a new health strategy that aligns with sector needs. In collaboration with regional councils, the MoH identifies healthcare requirements, including service locations and levels, based on geographic, demographic factors, and the prevalent disease patterns in each area. As the healthcare sector continues to evolve and modernize, there is an increasing focus on cutting-edge treatments, including gene therapy, which holds the potential to revolutionize the way genetic disorders and certain types of cancers are treated. The growing demand for advanced healthcare solutions, combined with increasing government investment in the sector, is creating a conducive environment for the development and commercialization of gene therapies.

Saudi Arabia's healthcare industry is experiencing rapid growth due to factors such as population growth, rising incidences of chronic diseases, and a growing awareness of advanced medical treatments. With a significant portion of the population affected by genetic disorders, including inherited conditions such as hemophilia, cystic fibrosis, and sickle cell disease, there is a growing need for innovative therapies. Gene therapy, which aims to treat or even cure genetic diseases by modifying the genetic material within a patient's cells, offers a promising solution to address these unmet medical needs. As more healthcare providers and patients recognize the potential of gene therapy, demand for these treatments is expected to increase.

The Saudi government is playing a pivotal role in driving the growth of the healthcare industry and, by extension, the gene therapy market. Recent breakthroughs in

genomics, including whole-genome sequencing and CRISPR-Cas9 gene editing, have significantly enhanced our understanding of molecular interventions for hereditary diseases. This research focuses on the development of computational gene models tailored to the genetic profile of Saudi Arabia, with a specific focus on autosomal recessive (AR) diseases. The study aims to create a specialized hybrid Convolutional Neural Network-Gated Recurrent Unit (CNN-GRU) model for the diagnosis of genetic disorders commonly found in Saudi Arabia. As part of its Vision 2030 initiative, the government has made substantial investments in healthcare infrastructure, research, and innovation. The establishment of research centers, partnerships with global biotech companies, and the promotion of medical tourism have all contributed to the country's growing reputation as a hub for advanced medical treatments. Additionally, regulatory bodies such as the Saudi Food and Drug Authority (SFDA) are actively working to streamline the approval process for novel therapies, including gene therapies, which further boosts market growth.

### Surge in Technological Advancements

The surge in technological advancements is a major driver of the Saudi Arabia gene therapy market, fueling its rapid growth and transformation. SaudiVax, located in the Kingdom of Saudi Arabia, is committed to expanding access to gene therapies and other critical biologics for patients across the Middle East and North Africa. In pursuit of this objective, the company has partnered with Merck to establish a state-of-the-art manufacturing facility. The region faces significant unmet medical needs, particularly for diseases that are endemic or prevalent but may not be a primary focus for multinational biotechnology companies. SaudiVax is actively working to attract top-tier talent to bridge this gap, aiming to support regional healthcare advancements by developing innovative therapeutics grounded in the latest scientific research, regulatory standards, and manufacturing technologies. As gene therapy evolves from experimental treatments to viable therapeutic options, innovations in technology have significantly enhanced the development, delivery, and efficacy of gene-based treatments. These advancements are accelerating the adoption of gene therapy in Saudi Arabia, with promising applications in treating genetic disorders, cancers, and other complex diseases.

A key technological development driving the market is the progress in gene editing technologies, such as CRISPR-Cas9, which allows for precise modifications to the DNA sequence. This breakthrough has revolutionized the potential for correcting genetic mutations that cause hereditary diseases, providing hope for patients with conditions once considered untreatable. The increasing refinement of gene editing tools ensures greater accuracy, efficiency, and safety, addressing the challenges of off-target effects

and boosting confidence in gene therapy as a therapeutic option.

Additionally, advancements in viral vector technologies, which are used to deliver therapeutic genes to target cells, have enhanced the effectiveness of gene therapies. Innovations in viral vector design, such as using modified adeno-associated viruses (AAVs) and lentiviruses, have improved the precision and safety of gene delivery, minimizing immune responses and maximizing therapeutic potential. These advancements are critical for expanding the range of conditions that gene therapy can address, from rare genetic disorders to more common chronic diseases.

## Key Market Challenges

### High Treatment Costs

The development of gene therapies involves extensive research, rigorous clinical trials, and high costs associated with the development of new drugs. The process of developing gene therapies, which often includes modifying or replacing faulty genes to treat diseases, requires advanced technologies and highly specialized expertise. These R&D activities demand considerable investment in time and resources, which are passed on to patients once the therapy is commercialized. The expensive nature of R&D for gene therapies poses a challenge to both manufacturers and healthcare systems, particularly in markets like Saudi Arabia where the overall healthcare budget can face constraints.

Gene therapy manufacturing is complex and costly, involving highly specialized facilities, sophisticated equipment, and skilled personnel. The production of gene therapies typically requires the use of viral vectors to deliver genetic material, and this process is intricate and requires strict quality controls to ensure safety and efficacy. The need for personalized therapies, which are tailored to individual patients, further escalates the cost of production. The high manufacturing costs not only impact the price of the treatment but also create barriers to scaling up production to meet increasing demand, limiting the number of patients who can access these therapies in Saudi Arabia.

Gene therapies are subject to stringent regulatory requirements to ensure patient safety and therapeutic effectiveness. In Saudi Arabia, as in other countries, the approval and regulation of gene therapies are governed by rigorous standards set by the Saudi Food and Drug Authority (SFDA) and other relevant health authorities. Meeting these regulations involves additional costs related to compliance, testing, and approval

processes, further driving up the overall price of gene therapies. These regulatory hurdles can delay the introduction of new treatments into the market, limiting their availability to patients and placing an additional financial burden on healthcare systems.

## Key Market Trends

### Increased Focus on Personalized Medicine

Personalized medicine is increasingly being recognized as a key strategy in improving patient outcomes, particularly in the treatment of complex and rare genetic disorders. GCC countries have acknowledged the significance of personalized medicine, with the King Faisal Specialist Hospital and Research Centre in Saudi Arabia pioneering genomics research. It is anticipated that other institutions will follow suit. In Saudi Arabia, the prevalence of genetic disorders, such as thalassemia, sickle cell anemia, and other hereditary conditions, has contributed to the rising demand for targeted therapies that are customized to an individual's genetic profile. Gene therapies, which aim to correct genetic mutations or introduce new genes to treat diseases, are a perfect fit for this approach. By focusing on the genetic makeup of patients, personalized gene therapies can offer more precise and effective treatment options, improving the chances of successful outcomes.

The shift towards personalized care in Saudi Arabia is aligning with global healthcare trends, where patients and healthcare providers are increasingly seeking treatments that go beyond traditional approaches. The country's growing understanding of the benefits of personalized medicine, combined with its substantial investments in healthcare infrastructure, positions it as a strong contender in the global gene therapy market.

The rise of personalized medicine in Saudi Arabia's gene therapy market is driven by significant advancements in genomic research and biotechnology. With the increasing availability of genomic sequencing technologies, such as next-generation sequencing (NGS), healthcare providers are now able to identify genetic mutations more quickly and accurately. This allows for a deeper understanding of the underlying causes of diseases at the molecular level, making it easier to develop personalized treatment plans.

## Segmental Insights

### Type Insights

Based on Type, Gene Augmentation have emerged as the fastest growing segment in the Saudi Arabia Gene Therapy Market in 2024. One of the primary drivers of the gene augmentation segment's growth is the rise in the number of genetic disorders in Saudi Arabia. The country has a higher-than-average prevalence of inherited genetic conditions, such as sickle cell disease, thalassemia, and other hemoglobinopathies, many of which are treatable or manageable through gene augmentation techniques. These conditions, which often require long-term management or even lifelong treatments, create a compelling need for more permanent, curative solutions like gene augmentation. The potential to offer life-changing or life-saving treatments for patients with these genetic diseases has accelerated the adoption of gene augmentation therapies.

Moreover, Saudi Arabia's commitment to advancing its healthcare system under Vision 2030 has led to significant investments in medical research, biotechnology, and the development of cutting-edge therapies. This includes support for gene therapy initiatives, where gene augmentation is at the forefront of innovation. As the healthcare infrastructure in the kingdom continues to improve, more specialized treatment centers and facilities are being established to offer these advanced therapies, making gene augmentation more accessible to patients.

### Application Insights

Based on Application, Oncological Diseases have emerged as the fastest growing segment in the Saudi Arabia Gene Therapy Market during the forecast period. One of the primary reasons for the growth of oncological diseases within the gene therapy market is the limitations of traditional cancer treatments, such as chemotherapy, radiation, and surgery. While these methods remain essential, they often come with significant side effects and limited effectiveness, especially in advanced stages of cancer. Gene therapy provides a potential alternative by targeting the genetic mutations that drive cancer, offering a more precise and potentially less toxic treatment approach. By modifying the genetic makeup of cancer cells or boosting the body's immune system to better fight cancer, gene therapy aims to address the root causes of cancer at a molecular level.

Advancements in gene editing technologies, particularly CRISPR-Cas9, have significantly improved the ability to target cancer cells and correct genetic mutations that cause or promote tumor growth. These innovations have made it possible to develop gene therapies that can be tailored to individual patients, increasing the effectiveness of treatments and minimizing side effects. The ability to personalize cancer treatments



based on a patient's genetic profile has created new opportunities for gene therapy in oncology, contributing to its growth in Saudi Arabia.

## Regional Insights

Based on Region, Northern & Central have emerged as the dominating region in the Saudi Arabia Gene Therapy Market in 2024. The Northern and Central regions are home to some of Saudi Arabia's largest and most advanced healthcare institutions, particularly in cities like Riyadh, the capital. Riyadh is a central hub for medical research, clinical trials, and the implementation of advanced therapies. The concentration of specialized hospitals, medical universities, and research centers in this region has fostered a conducive environment for the development and adoption of gene therapies.

The Northern and Central regions have a higher concentration of healthcare professionals, researchers, and specialists in gene therapy and molecular medicine. This skilled workforce is essential for advancing the adoption of gene therapy technologies, as it facilitates the development, clinical testing, and administration of gene therapies. The region's robust educational and training systems also contribute to an increasing talent pool in the field of gene therapy.

## Key Market Players

Vertex Pharmaceuticals (Europe) Limited

CRISPR Therapeutics AG

Merck Limited

Medical Business Center Co.

Salehiya Medical

## Report Scope

In this report, the Saudi Arabia Gene Therapy Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

### Saudi Arabia Gene Therapy Market, By Type:

Gene Augmentation

Gene Silencing

Others

### Saudi Arabia Gene Therapy Market, By Application:

Oncological Diseases

Genetic Diseases

Cardiovascular Diseases

Neuromuscular Diseases

Hematological Diseases

Infectious Diseases

Others

### Saudi Arabia Gene Therapy Market, By Region:

Eastern

Western

Northern & Central

Southern

### Competitive Landscape



**Company Profiles:** Detailed analysis of the major companies present in the Saudi Arabia Gene Therapy Market.

**Available Customizations:**

Saudi Arabia Gene Therapy Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

**Company Information**

Detailed analysis and profiling of additional market players (up to five).

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