RNA-Based Therapeutics Market: Promising Potential for Targeted and Personalized Medicine | CAGR of 17.6% (2021 to 2030)

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RNA Based Therapeutic Market Research

According to the report, the global RNA based therapeutics industry was estimated at $4.93 billion in 2021, and is anticipated to hit $25.12 billion by 2030,

CAGR: 17.6%

Current Market Size: USD 4.93 Billion

Forecast Growing Region: APAC

Largest Market: North America

RNA-based therapeutics are a type of medicine that uses molecules called RNA (ribonucleic acid) to treat diseases. RNA is a type of genetic material that helps cells create proteins, which are essential for many bodily functions.

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RNA interference (RNAi): This technique uses short RNA molecules to "silence" specific genes or proteins, preventing them from being expressed. This can be useful for treating diseases caused by overactive or malfunctioning genes, such as certain types of cancer or genetic disorders.

mRNA therapy: This involves delivering a specific type of RNA called messenger RNA (mRNA) to cells in the body. The mRNA provides instructions for cells to produce a particular protein, which can be used to treat diseases caused by a deficiency or absence of that protein.

CRISPR-Cas9 gene editing: This is a more advanced RNA-based therapy that uses a molecule called CRISPR-Cas9 to edit specific genes in the body. This can potentially be used to cure genetic diseases by correcting mutations in the DNA.

RNA-based therapeutics have the potential to treat a wide range of diseases, including cancer, genetic disorders, and infectious diseases. They are still a relatively new field, but research in this area is ongoing and shows promise for the development of new, effective treatments.

Also, mRNA vaccines could potentially offer long-term solutions all over the world for diseases ranging from influenza to AIDS, but owing to lockdown measures and temporary closure of research institutes and academic research, the demand for RNA based therapeutic solutions decreased significantly.

This trend is quite likely to continue till the pandemic is completely over.

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Messenger RNA (mRNA): mRNA is a type of RNA that carries genetic information from DNA to ribosomes in cells, where it is used to produce proteins. In mRNA therapy, synthetic mRNA molecules can be designed and delivered to cells to produce specific proteins that may be missing or deficient in a disease state.

Small interfering RNA (siRNA): siRNA is a type of RNA molecule that can specifically target and silence certain genes or proteins. This is accomplished by delivering siRNA molecules to cells, where they bind to complementary mRNA molecules and prevent them from being translated into protein.

MicroRNA (miRNA): miRNA is a type of small RNA molecule that can regulate gene expression by

binding to mRNA and preventing it from being translated into protein. Some miRNAs have been shown to be dysregulated in certain diseases, and restoring their normal function through RNA-based therapeutics may be a promising approach to treatment.

CRISPR RNA (crRNA): crRNA is used in the CRISPR-Cas9 gene editing system, which allows researchers to precisely target and modify specific genes in cells. This has potential applications in treating genetic disorders and other diseases caused by mutations in DNA.

By using different types of RNA molecules, researchers can develop RNA-based therapeutics with a variety of mechanisms of action and targets, making them a versatile tool for treating a wide range of diseases.

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There are several factors that impact the development and success of RNA-based therapeutics, but one of the most significant is the delivery of RNA molecules to the target cells or tissues. RNA molecules are relatively large and fragile compared to other small molecule drugs, which makes it challenging to deliver them to the desired site in the body without being degraded or eliminated by the body's defense mechanisms.

Another important factor is the stability of RNA molecules. RNA is more prone to degradation than DNA or proteins, which can limit its effectiveness and require the use of specialized stabilizing agents to protect the RNA molecule from being broken down before it can reach its target.

The choice of RNA molecule and the specific disease target also play a role in the success of RNA-based therapeutics. Some diseases may be more amenable to treatment with RNA-based drugs than others, depending on the underlying molecular mechanisms involved.

Lastly, the regulatory landscape for RNA-based therapeutics is also an important factor. As a relatively new and rapidly evolving field, there is a need for clear and consistent regulatory guidance to ensure the safety and efficacy of RNA-based drugs, which can impact the speed of development and market adoption of these therapies.

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The market across North America dominated in 2020, garnering more than two-fifths the global RNA based therapeutics market. High expenditure on R&D, presence of major players & their product availability, and well-established healthcare infrastructure in the region propel the market growth. Simultaneously, the Asia-Pacific region is also expected to cite the fastest CAGR of 18.9% throughout the forecast period. This is attributed to improvements in R&D facilities, available disposable income, and rapidly developing economic conditions.

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