

Global Ligase Market to Reach \$667.9 Billion by 2033, Driven by Advancements in Gene Therapy and Diagnostics

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VANCOUVER, BRITISH COLUMBIA, CANADA, May 14, 2025 /EINPresswire.com/ -- The latest report titled Global <u>Ligase Market</u> contains an in-depth analysis of the fundamental parameters contributing to the global Ligase market scenario. This research report offers readers an in-depth interpretation of the dynamics of the



Ligase market, including key drivers, opportunities, threats, and challenges. The report also briefly discusses key business strategies, supply-demand ratios, key regions, prominent market players, and offers a future outlook for the overall Ligase industry.

The global Ligase market is projected to grow significantly, from an estimated \$412.5 billion by the end of 2024 to \$667.9 billion by 2033. This reflects a steady compound annual growth rate (CAGR) of 5.50% during the forecast period, according to the latest industry analysis. The rise in genetic disorders, infectious diseases, and breakthroughs in biotechnology are key factors fueling market growth.

Ligases are enzymes that play an essential role in joining DNA and RNA strands, making them highly valuable in genetic research and diagnostics. Their use is especially critical in techniques like polymerase chain reaction (PCR), gene cloning, and DNA sequencing. As the demand for next-generation sequencing (NGS) and gene-editing tools like CRISPR increases, the need for reliable ligase enzymes continues to rise.

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The healthcare and life sciences sectors are increasingly turning to ligases to support personalized medicine and gene therapy development. These enzymes help researchers and pharmaceutical companies design treatments that are more targeted and effective. The growing focus on precision medicine has made ligases a key tool in identifying genetic mutations and developing therapies for conditions such as cancer and inherited disorders.

Public health concerns are also pushing the market forward. According to the Centers for Disease Control and Prevention (CDC), the incidence of tuberculosis in the United States rose by 9.4% from 2020 to 2021. Similarly, data from the World Health Organization (WHO) in 2022 showed 10.6 million tuberculosis cases globally in 2021. Ligases are widely used in diagnostic tools that detect infectious diseases like tuberculosis and influenza, further expanding their role in disease control.

Research funding in biotechnology is also rising, helping improve the quality and performance of ligases. Technological advancements in enzyme development are making these enzymes more efficient and suitable for various applications. In addition to healthcare, ligases are finding new uses in fields such as forensic science, agricultural biotechnology, and drug development.

One of the major drivers of market growth is the increasing need for ligases in disease treatment. These enzymes are vital in developing gene-based therapies and diagnostics. They enable scientists to identify and repair DNA sequences that may cause disease, making them crucial for modern drug discovery and development. Their role in NGS and PCR-based diagnostics also makes them essential tools in detecting a wide range of illnesses.

However, the market does face challenges. One of the main concerns is the variability in ligases' ability to repair DNA and RNA. Some ligases are less effective with certain DNA structures, which can affect the reliability of genetic testing and treatments. Differences in how these enzymes perform under specific conditions also mean that researchers often need to spend more time and resources to optimize them for use.

In terms of application, PCR currently leads the ligase market and held the largest share in 2024. Its widespread use in medical diagnostics, especially during the COVID-19 pandemic, has increased demand for ligases. Innovations like ligase chain reaction and real-time PCR continue to enhance how diseases are detected and monitored.

Cloning is expected to be the fastest-growing application segment. With growing interest in genetic engineering and synthetic biology, ligases are becoming more important in developing genetically modified organisms, new medicines, and gene therapies. The adoption of CRISPR and other editing tools is further increasing the demand for efficient ligase enzymes.

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Competitive Terrain:

The global Ligase industry is highly consolidated owing to the presence of renowned companies operating across several international and local segments of the market. These players dominate the industry in terms of their strong geographical reach and a large number of production facilities. The companies are intensely competitive against one another and excel in their individual technological capabilities, as well as product development, innovation, and product pricing strategies.

Some major companies included in the Ligase market report are:

Agilent Technologies Inc.

ArcticZymes Technologies

Becton, Dickinson and Company

Creative Enzymes

Merck KGaA

New England Biolabs

Oxford Nanopore Technologies

Promega Corporation

QIAGEN

R&D Systems, Inc

Takara Bio Inc.

Thermo Fisher Scientific

The report further divides the Ligase market into key segments such as types, applications, enduser industries, technologies, and key regions of the market. The report also sheds light on the segment and region exhibiting promising growth in the Ligase market.

Ligase Market Segmentation Analysis

By Source and by Region Forecast to 2033

Bacteria

Virus

Other Microorganisms

Animal

Plant

By Application and by Region Forecast to 2033

Polymerase Chain Reaction

Cloning

Mutation Detection

Next-generation Sequencing

Drug Target

By End User and by Region Forecast to 2033

Diagnostic Centers and Hospitals

Research Institutes

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Regional Outlook:

North America (the U.S., Canada, Mexico)

Europe (the U.K., Germany, France, Italy)

Asia Pacific (India, China, Japan, Korea)

Latin America (Brazil, Argentina, Ecuador, Chile)

Middle East & Africa (Egypt, Turkey, Saudi Arabia, Iran)

Key Questions Answered by the Report:

Which region is expected to dominate the market in the coming years?

What are the recent technological and product advancements occurring in the market?

What are the key strategies adopted by the prominent players in the Ligase market?

What are the key product types and applications of the Ligase industry?

What is the outcome of SWOT analysis and Porter's Five Forces analysis?

How is the competitive landscape of the Ligase market?

Who are the key players in the industry?

What is the growth rate of the industry over the coming years?

What will be the valuation of the Ligase Market by 2033?

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Eric Lee Emergen Research + +91 90210 91709 sales@emergenresearch.com Visit us on social media: LinkedIn Facebook X

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