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DNA-encoded Library Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Product & Service (Kits & Reagents, Encoded Libraries, Design & Synthesis Services, Screening Services, Others), By Therapeutic Area (Oncology, Infectious Diseases, Cardiovascular Diseases, Neurological Diseases, Autoimmune Diseases, Metabolic Diseases, Others), By Application (Hit Generation / Identification, Hit to Lead, Hit Validation / Optimization, Others), By End Use (Academic & Research Institutes, Pharmaceutical & Biotechnology Companies, Contract Research Organizations, Others), By Region and Competition, 2020-2030F

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Abstracts

Market Overview

The Global DNA-encoded Library (DEL) Market was valued at USD 762.08 Million in 2024 and is projected to reach USD 1632.26 Million by 2030, growing at a CAGR of 13.51%. DEL technology is revolutionizing early-stage drug discovery by enabling simultaneous screening of billions of compounds, which enhances efficiency and accelerates hit identification. As pharmaceutical and biotech companies seek scalable, cost-effective platforms for bioactive molecule discovery, DELs are gaining traction due to their high-throughput capabilities and chemical diversity. Increased R&D investment, growing interest in personalized medicine, and the demand for faster therapeutic

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development continue to drive adoption. Integration of artificial intelligence and machine learning into DEL workflows further enhances compound analysis, lead selection, and predictive modeling. With technological innovations in encoding chemistries and compound scaffolds, and the emergence of hybrid screening strategies, the DEL market is poised for continued robust growth.

Key Market Drivers

Rising Demand for Efficient Drug Discovery Methods

The surge in demand for efficient drug discovery methods is a major factor driving the growth of the DEL market. Traditional drug discovery involves extensive time and financial investment, often with low success rates. DELs address this issue by enabling the rapid screening of billions of small molecules tagged with unique DNA barcodes, allowing researchers to identify promising interactions with target proteins more effectively. This method significantly reduces the time and cost associated with early-stage drug development. As pharmaceutical companies aim to speed up the development of targeted therapies for complex conditions such as cancer and neurological disorders, the scalability and precision of DEL technology offer a compelling advantage. The ability to explore vast chemical spaces and develop tailored treatments aligns with the industry's shift toward precision medicine, reinforcing DEL’s role as a vital tool in modern drug discovery.

Key Market Challenges

Complexity of Library Design and Synthesis

The intricate process of designing and synthesizing DNA-encoded libraries presents a key challenge to market growth. Creating diverse libraries requires specialized expertise in conjugating small molecules with DNA tags, with multiple synthesis steps that must be precisely executed. Maintaining the fidelity and reproducibility of libraries across large datasets is a technical hurdle, as errors in encoding can lead to inaccurate screening outcomes. Additionally, balancing chemical diversity with biological compatibility limits the scope of compound design. Some complex molecules or desired modifications may be difficult to synthesize or require extensive refinement, increasing time and costs. These complexities affect consistency and scalability, especially during transition from discovery to lead optimization.

Key Market Trends

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Increasing Adoption of High-Throughput Screening Technologies

High-throughput screening (HTS) technologies are becoming increasingly integrated with DEL platforms, enabling rapid evaluation of millions to billions of compounds. This combination boosts drug discovery efficiency by reducing time and cost while increasing hit identification accuracy. Advances in automation, robotics, and data analytics are optimizing HTS workflows, making them more adaptable to DEL applications. Artificial intelligence and machine learning algorithms are further enhancing analysis by improving target interaction predictions and prioritizing hits. These capabilities are essential in the discovery of novel therapeutics for oncology, infectious diseases, and neurological disorders, fueling broader market adoption.

Key Market Players

Merck KGaA

GenScript Biotech Corporation

Pharmaron Beijing Co., Ltd.

WuXi AppTec Co., Ltd.

Aurigene Pharmaceutical Services Limited

BOC Sciences

LGC Bioresearch Technologies

SPT Labtech Ltd.

Charles River Laboratories International, Inc.

Life Chemicals Inc.

Report Scope

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In this report, the Global DNA-encoded Library Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

DNA-encoded Library Market, By Product & Service:

- Kits & Reagents
- Encoded Libraries
- Design & Synthesis Services
- Screening Services
- Others

DNA-encoded Library Market, By Therapeutic Area:

- Oncology
- Infectious Diseases
- Cardiovascular Diseases
- Neurological Diseases
- Autoimmune Diseases
- Metabolic Diseases
- Others

DNA-encoded Library Market, By Application:

- Hit Generation / Identification

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Hit to Lead

Hit Validation / Optimization

Others

DNA-encoded Library Market, By End Use:

Academic & Research Institutes

Pharmaceutical & Biotechnology Companies

Contract Research Organizations

Others

DNA-encoded Library Market, By Region:

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia-Pacific

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China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global DNA-encoded Library Market.

Available Customizations

Global DNA-encoded Library Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

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Company Information

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

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