

Global Optical Genome Mapping Market Size study, by Product (Instruments, Consumables and Reagents, Software, and Services), by Application (Structural Variant Detection, Genome Assembly, Microbial Strain Typing, and Others), by End-User (Biotechnology and Pharmaceutical Companies, Clinical Laboratories, Academic Research Institutes, and Others), and Regional Forecasts 2022-2032

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Abstracts

The Global Optical Genome Mapping Market is valued at approximately USD 0.20 billion in 2023 and is projected to grow at a striking CAGR of 28.60% during the forecast period 2024-2032. Optical genome mapping (OGM), a revolutionary molecular cytogenomic technology, is rewriting the playbook on how structural variants in genomes are visualized and interpreted with unparalleled resolution and throughput. Unlike traditional sequencing approaches, OGM enables the detection of complex genomic rearrangements—like large deletions, duplications, inversions, and translocations—that often go undetected. This transformative capability is driving its adoption across a spectrum of disciplines including rare disease diagnostics, cancer genomics, and microbiology. The ability of OGM to produce high-fidelity genome maps through real-time imaging of ultra-long DNA molecules positions it as a cornerstone technology in the future of precision medicine and genomics research.

As the global biomedical research ecosystem accelerates toward data-intensive, scalable, and accurate genetic solutions, the optical genome mapping market is finding itself at the crux of a major technological inflection point. Increasing demand for comprehensive structural variant analysis and accurate genome assembly, especially in



complex disease landscapes, is significantly fueling market growth. Major public and private sector investments aimed at advancing cytogenomic profiling and bioinformatics infrastructure are further reinforcing the commercial uptake of OGM platforms. However, adoption hurdles such as limited awareness in certain clinical domains, high instrument cost, and the need for skilled personnel capable of interpreting large-scale optical data may temporarily restrain the growth trajectory in emerging markets.

The ongoing diversification of product offerings—from high-resolution imaging instruments to reagents, software suites, and tailored services—underscores the market's evolution toward integrated ecosystem solutions. Instruments equipped with nanochannel arrays are enabling researchers to visualize megabase-scale genome structures, while AI-powered software tools are enhancing the interpretation of high-throughput genome maps. Furthermore, service-based OGM solutions are offering laboratories the ability to outsource their structural variant analyses, reducing capital burden and boosting accessibility. As demand continues to rise, manufacturers are focusing heavily on developing end-to-end solutions that streamline workflow, improve turnaround time, and support diagnostic scalability.

Beyond structural variant detection, OGM is gaining remarkable traction in applications such as microbial strain typing, genome assembly, and large-scale agricultural and environmental genomics. Its unmatched ability to untangle complex genomic architectures is particularly valuable in deciphering unknown bacterial strains, novel viruses, and gene cluster dynamics in biotechnological and pharmaceutical R&D. The growing relevance of OGM in pharmacogenomics and personalized therapy pipelines adds another lucrative layer to its market potential. Academic research institutions are also emerging as power users, leveraging OGM for discovery research in genetics, chromosomal aberrations, and evolutionary biology.

Regionally, North America holds the lion's share of the optical genome mapping market, driven by a robust biotechnology industry, widespread research funding, and the presence of pioneering players and academic collaborators. The U.S., in particular, leads with high technology adoption rates and favorable regulatory environments. Europe trails closely, with progressive genomics research programs in countries like Germany, France, and the UK. Meanwhile, the Asia Pacific region is poised to experience the fastest expansion owing to increasing healthcare expenditures, growing genomics initiatives in China and India, and expanding academic research infrastructure. Latin America and the Middle East & Africa also offer untapped potential as awareness and investment in genomics technology steadily rise.



Major market player included in this report are:

Bionano Genomics, Inc.

Agilent Technologies, Inc.

Thermo Fisher Scientific, Inc.

PerkinElmer, Inc.

Bio-Rad Laboratories, Inc.

Illumina, Inc.

Nabsys, Inc.

Nucleome Informatics Pvt Ltd

Qiagen N.V.

F. Hoffmann-La Roche Ltd

OpGen, Inc.

BioNano Australasia

Genomic Vision

Phase Genomics

Stratos Genomics (a Roche company)

The detailed segments and sub-segment of the market are explained below:

By Product

Instruments

Global Optical Genome Mapping Market Size study, by Product (Instruments, Consumables and Reagents, Software,...



Consumables and Reagents

Software

Services

By Application

Structural Variant Detection

Genome Assembly

Microbial Strain Typing

Others

By End-User

Biotechnology and Pharmaceutical Companies

Clinical Laboratories

Academic Research Institutes

Others

By Region:

North America

U.S.

Canada



Europe

UK

Germany

France

Spain

Italy

Rest of Europe

Asia Pacific

China

India

Japan

Australia

South Korea

Rest of Asia Pacific

Latin America

Brazil

Mexico

Middle East & Africa



Saudi Arabia

South Africa

Rest of Middle East & Africa

Years considered for the study are as follows:

Historical year - 2022

Base year - 2023

Forecast period - 2024 to 2032

Key Takeaways:

Market Estimates & Forecast for 10 years from 2022 to 2032.

Annualized revenues and regional level analysis for each market segment.

Detailed analysis of geographical landscape with Country level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market approach.

Analysis of competitive structure of the market.

Demand side and supply side analysis of the market.



Contents

CHAPTER 1. GLOBAL OPTICAL GENOME MAPPING MARKET EXECUTIVE SUMMARY

- 1.1. Global Optical Genome Mapping Market Size & Forecast (2022 2032)
- 1.2. Regional Summary
- 1.3. Segmental Summary
- 1.3.1. By Product
- 1.3.2. By Application
- 1.3.3. By End-User
- 1.4. Key Trends
- 1.5. Recession Impact
- 1.6. Analyst Recommendation & Conclusion

CHAPTER 2. GLOBAL OPTICAL GENOME MAPPING MARKET DEFINITION AND RESEARCH ASSUMPTIONS

- 2.1. Research Objective
- 2.2. Market Definition
- 2.3. Research Assumptions
 - 2.3.1. Inclusion & Exclusion
 - 2.3.2. Limitations
 - 2.3.3. Supply Side Analysis
 - 2.3.3.1. Availability
 - 2.3.3.2. Infrastructure
 - 2.3.3.3. Regulatory Environment
 - 2.3.3.4. Market Competition
 - 2.3.3.5. Economic Viability (Consumer's Perspective)
 - 2.3.4. Demand Side Analysis
 - 2.3.4.1. Regulatory Frameworks
 - 2.3.4.2. Technological Advancements
 - 2.3.4.3. Environmental Considerations
 - 2.3.4.4. Consumer Awareness & Acceptance
- 2.4. Estimation Methodology
- 2.5. Years Considered for the Study
- 2.6. Currency Conversion Rates

CHAPTER 3. GLOBAL OPTICAL GENOME MAPPING MARKET DYNAMICS



3.1. Market Drivers

- 3.1.1. Rising Demand for Comprehensive Structural Variant Profiling
- 3.1.2. Surge in Genomics Research Funding and Infrastructure
- 3.1.3. Technological Advancements in High-Throughput Imaging Platforms
- 3.2. Market Challenges
 - 3.2.1. High Capital Expenditure for OGM Instrumentation
 - 3.2.2. Shortage of Skilled Bioinformatics Personnel
- 3.3. Market Opportunities
 - 3.3.1. Service-Based OGM Offerings to Expand Accessibility
 - 3.3.2. AI-Enabled Data Analysis for Enhanced Throughput
 - 3.3.3. Emerging Adoption in Microbial and Agricultural Genomics

CHAPTER 4. GLOBAL OPTICAL GENOME MAPPING MARKET INDUSTRY ANALYSIS

- 4.1. Porter's Five Forces Model
 - 4.1.1. Bargaining Power of Suppliers
 - 4.1.2. Bargaining Power of Buyers
 - 4.1.3. Threat of New Entrants
 - 4.1.4. Threat of Substitutes
 - 4.1.5. Competitive Rivalry
 - 4.1.6. Futuristic Approach to Porter's Five Forces
 - 4.1.7. Porter's Five Forces Impact Analysis

4.2. PESTEL Analysis

- 4.2.1. Political
- 4.2.2. Economic
- 4.2.3. Social
- 4.2.4. Technological
- 4.2.5. Environmental
- 4.2.6. Legal
- 4.3. Top Investment Opportunity
- 4.4. Top Winning Strategies
- 4.5. Disruptive Trends
- 4.6. Industry Expert Perspective
- 4.7. Analyst Recommendation & Conclusion

CHAPTER 5. GLOBAL OPTICAL GENOME MAPPING MARKET SIZE & FORECASTS BY PRODUCT 2022 – 2032



5.1. Segment Dashboard

5.2. Global Optical Genome Mapping Market: Product Revenue Trend Analysis, 2022 & 2032 (USD Million)

- 5.2.1. Instruments
- 5.2.2. Consumables and Reagents
- 5.2.3. Software
- 5.2.4. Services

CHAPTER 6. GLOBAL OPTICAL GENOME MAPPING MARKET SIZE & FORECASTS BY APPLICATION 2022 – 2032

6.1. Segment Dashboard

6.2. Global Optical Genome Mapping Market: Application Revenue Trend Analysis, 2022 & 2032 (USD Million)

- 6.2.1. Structural Variant Detection
- 6.2.2. Genome Assembly
- 6.2.3. Microbial Strain Typing
- 6.2.4. Others

CHAPTER 7. GLOBAL OPTICAL GENOME MAPPING MARKET SIZE & FORECASTS BY END-USER 2022 – 2032

7.1. Segment Dashboard

7.2. Global Optical Genome Mapping Market: End-User Revenue Trend Analysis, 2022 & 2032 (USD Million)

- 7.2.1. Biotechnology and Pharmaceutical Companies
- 7.2.2. Clinical Laboratories
- 7.2.3. Academic Research Institutes
- 7.2.4. Others

CHAPTER 8. GLOBAL OPTICAL GENOME MAPPING MARKET SIZE & FORECASTS BY REGION 2022 – 2032

- 8.1. North America Optical Genome Mapping Market
 - 8.1.1. U.S. Optical Genome Mapping Market
 - 8.1.1.1. Product breakdown size & forecasts, 2022 2032
 - 8.1.1.2. Application breakdown size & forecasts, 2022 2032
 - 8.1.2. Canada Optical Genome Mapping Market



- 8.2. Europe Optical Genome Mapping Market
 - 8.2.1. UK Optical Genome Mapping Market
 - 8.2.2. Germany Optical Genome Mapping Market
 - 8.2.3. France Optical Genome Mapping Market
 - 8.2.4. Spain Optical Genome Mapping Market
 - 8.2.5. Italy Optical Genome Mapping Market
- 8.2.6. Rest of Europe Optical Genome Mapping Market
- 8.3. Asia Pacific Optical Genome Mapping Market
- 8.3.1. China Optical Genome Mapping Market
- 8.3.2. India Optical Genome Mapping Market
- 8.3.3. Japan Optical Genome Mapping Market
- 8.3.4. Australia Optical Genome Mapping Market
- 8.3.5. South Korea Optical Genome Mapping Market
- 8.3.6. Rest of Asia Pacific Optical Genome Mapping Market
- 8.4. Latin America Optical Genome Mapping Market
- 8.4.1. Brazil Optical Genome Mapping Market
- 8.4.2. Mexico Optical Genome Mapping Market
- 8.4.3. Rest of Latin America Optical Genome Mapping Market
- 8.5. Middle East & Africa Optical Genome Mapping Market
 - 8.5.1. Saudi Arabia Optical Genome Mapping Market
 - 8.5.2. South Africa Optical Genome Mapping Market
 - 8.5.3. Rest of Middle East & Africa Optical Genome Mapping Market

CHAPTER 9. COMPETITIVE INTELLIGENCE

- 9.1. Key Company SWOT Analysis
 - 9.1.1. Bionano Genomics, Inc.
 - 9.1.2. Agilent Technologies, Inc.
 - 9.1.3. Thermo Fisher Scientific, Inc.
- 9.2. Top Market Strategies
- 9.3. Company Profiles
- 9.3.1. Bionano Genomics, Inc.
 - 9.3.1.1. Key Information
 - 9.3.1.2. Overview
 - 9.3.1.3. Financial (Subject to Data Availability)
 - 9.3.1.4. Product Summary
 - 9.3.1.5. Market Strategies
- 9.3.2. Agilent Technologies, Inc.
- 9.3.3. Thermo Fisher Scientific, Inc.



- 9.3.4. PerkinElmer, Inc.
- 9.3.5. Bio-Rad Laboratories, Inc.
- 9.3.6. Illumina, Inc.
- 9.3.7. Nabsys, Inc.
- 9.3.8. Nucleome Informatics Pvt Ltd
- 9.3.9. Qiagen N.V.
- 9.3.10. F. Hoffmann-La Roche Ltd
- 9.3.11. OpGen, Inc.
- 9.3.12. BioNano Australasia
- 9.3.13. Genomic Vision
- 9.3.14. Phase Genomics
- 9.3.15. Stratos Genomics (a Roche company)

CHAPTER 10. RESEARCH PROCESS

- 10.1. Research Process
- 10.1.1. Data Mining
- 10.1.2. Analysis
- 10.1.3. Market Estimation
- 10.1.4. Validation
- 10.1.5. Publishing
- 10.2. Research Attributes



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