

# Global Metabolomics Market 2023

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## Abstracts

Metabolomics is a rapidly evolving field of scientific research that focuses on the comprehensive study of metabolites, the small molecules produced during metabolic processes in living organisms. It involves the identification, quantification, and analysis of these metabolites to gain insights into biochemical pathways, cellular processes, and overall physiological conditions.

The main objective of metabolomics is to understand the dynamic interactions between an organism's genes, environment, and lifestyle factors that ultimately influence its metabolism. By studying the metabolome, which represents the complete set of metabolites within a biological system, researchers can unravel the complex metabolic networks and discover biomarkers associated with various diseases, drug responses, and environmental exposures.

Metabolomics employs advanced analytical techniques such as mass spectrometry (MS), nuclear magnetic resonance (NMR) spectroscopy, and chromatography to detect, identify, and quantify metabolites in different biological samples. These techniques generate vast amounts of data, which are then analyzed using bioinformatics tools and statistical models to extract meaningful information.

The global metabolomics market is likely to register a CAGR of over 11.7% with an incremental growth of USD 11.7 billion during the forecast period 2023-2029. There is an increasing investment in metabolomics research through both public and private funding sources. The recognition of metabolomics as a valuable field of study has led to substantial financial support, enabling researchers to conduct innovative studies and explore new applications.

Another key driver is the expanding role of metabolomics in personalized medicine. With a growing emphasis on precision and personalized healthcare, metabolomics

offers a unique approach to understanding individual variations in metabolic profiles. By analyzing an individual's metabolites, it becomes possible to tailor treatments and interventions based on their specific metabolic needs, leading to improved therapeutic outcomes.

Additionally, the pharmaceutical and biotech industry is dedicating significant funds to metabolomics research and development (R&D). These sectors recognize the potential of metabolomics in drug discovery, target identification, and therapeutic optimization. The allocation of substantial R&D funding enables the development of novel metabolomics technologies, methodologies, and tools, further propelling the market's growth.

Moreover, the rapid technological advancements in the field of metabolomics drive market expansion. There have been remarkable developments in analytical techniques, data analysis software, and instrumentation, enabling more accurate and comprehensive metabolite profiling. These advancements enhance the efficiency, sensitivity, and throughput of metabolomics studies, attracting researchers and stakeholders alike.

The report covers market size and growth, segmentation, regional breakdowns, competitive landscape, trends and strategies for global metabolomics market. It presents a quantitative analysis of the market to enable stakeholders to capitalize on the prevailing market opportunities. The report also identifies top segments for opportunities and strategies based on market trends and leading competitors' approaches.

### Market Segmentation

Product: assays, bioinformatics tools, detection methods, separation methods

Indication: cancer, cardiovascular disorders (CVDs), inborn errors of metabolism (IEMs), neurological disorders, others

Application: biomarker discovery, drug discovery, functional genomics, nutrigenomics, toxicology testing, others

End user: academic and research institutes, metabolomic service providers, pharmaceutical and biotechnology companies, others

Region: Asia-Pacific, Europe, North America, MEA (Middle East and Africa), Latin America

Separation methods by type: capillary electrophoresis (CE), gas chromatography (GC), liquid chromatography (HPLC and UPLC)

Detection methods by type: mass spectrometry (MS), multivariate analysis (MVA),

spectroscopy (NMR and FTIR)

This industry report offers market estimates and forecasts of the global market, followed by a detailed analysis of the product, indication, application, end user, and region. The global market for metabolomics can be segmented by product: assays, bioinformatics tools, detection methods, separation methods. In 2022, the separation methods segment held a significant share of 42.1% in the global metabolomics market. However, it is the bioinformatics tools segment that is projected to exhibit the highest CAGR of 13.7% during the forecast period from 2023 to 2028. This notable growth can be attributed to the increasing utilization of various bioinformatics platforms in numerous metabolomic applications.

Bioinformatics plays a crucial role in metabolomics by facilitating the analysis, interpretation, and management of vast and complex metabolomic data. It provides researchers with powerful computational tools, algorithms, and databases to analyze metabolites, identify patterns, and generate meaningful insights. This technology-driven approach enables efficient drug discovery and development processes, leading to the development of more effective and targeted therapies.

The bioinformatics segment offers several advantages that contribute to its high growth rate. It ensures smooth technological workflows by streamlining data processing and analysis, thereby enhancing the efficiency and reliability of metabolomic studies. The utilization of bioinformatics platforms enables researchers to obtain precise and transparent data, enabling them to make well-informed decisions and draw accurate conclusions from their research findings.

Furthermore, the widespread adoption of bioinformatics in metabolomics is driven by its ability to integrate data from multiple sources and facilitate cross-platform data integration. This allows researchers to pool and compare data from various experiments and datasets, leading to a comprehensive understanding of metabolic pathways and enabling the discovery of new biomarkers or therapeutic targets.

Metabolomics market is further segmented by indication: cancer, cardiovascular disorders (CVDs), inborn errors of metabolism (IEMs), neurological disorders, others. The cancer segment held the largest share of the global metabolomics market in 2022 and is anticipated to hold its share during the forecast period. One significant factor is the increasing global incidence of cancer. With a rising number of individuals being diagnosed with cancer worldwide, there is a growing demand for effective treatments and diagnostic tools. Metabolomics plays a crucial role in cancer research by providing

valuable insights into the metabolic changes associated with cancer development, progression, and response to treatment. This drives the adoption of metabolomics in the field of oncology.

The market is witnessing the launch of technologically advanced products specifically designed to address cancer-related challenges. These innovative products leverage metabolomics technologies to enable early detection, accurate diagnosis, and personalized treatment strategies for cancer patients. The integration of cutting-edge technologies in cancer care enhances patient outcomes and improves overall survival rates.

Based on application, the metabolomics market is segmented into: biomarker discovery, drug discovery, functional genomics, nutrigenomics, toxicology testing, others. During the forecast period, the biomarker discovery segment is anticipated to dominate the global metabolomics market, holding the largest market share. However, it is the toxicology testing application segment that is projected to exhibit the highest CAGR of 12.6%.

There is a growing emphasis on early detection of toxicity, leading to increased research and development expenditures in this area. By identifying toxicity at an early stage, potential risks can be mitigated, and appropriate intervention strategies can be implemented. Additionally, there is a rising demand to address drug toxicity during the drug development phase, which further drives the need for advanced toxicology testing methodologies provided by metabolomics.

Furthermore, the emergence of new and promising technologies in the field of metabolomics contributes to the growth of the toxicology testing application segment. These innovative techniques enable researchers to delve into molecular-level changes in response to toxic exposure, thus facilitating the identification of toxicity pathways. This detailed understanding of toxicological mechanisms enhances the overall safety evaluation process.

On the basis of end user, the metabolomics market also can be divided into: academic and research institutes, metabolomic service providers, pharmaceutical and biotechnology companies, others. The global metabolomics market witnessed a significant growth in 2022, with the standalone metabolomics service providers segment capturing a considerable market share of 40.2%. The rise of metabolomics service providers has become increasingly crucial in the realm of research. These companies play a vital role by offering specialized services, including sample preparation and

analysis, data analysis and interpretation, and metabolite identification and quantification. Their expertise aids researchers in gaining a deeper understanding of cellular functioning and disease progression. Moreover, as the demand for their services continues to grow, more companies are entering the market, catering to the specific needs of researchers.

Metabolomics service providers offer an extensive array of services that encompass the analysis of metabolites in biological samples. Utilizing various techniques such as gas chromatography-mass spectrometry (GC-MS), liquid chromatography-mass spectrometry (LC-MS), nuclear magnetic resonance (NMR), and capillary electrophoresis (CE), these providers enable the identification, quantification, and analysis of metabolites present in biological samples. Through the analysis of metabolites, valuable insights can be gained into metabolic pathways, networks, and the underlying biochemical processes involved in the development and progression of diseases. This comprehensive approach opens new doors for groundbreaking research and enhances our understanding of complex biological systems.

Metabolomics market by region is categorized into: Asia-Pacific, Europe, North America, MEA (Middle East and Africa), Latin America. In 2022, North America emerged as the leading region in the global metabolomics market, holding the largest market share. This dominance can be attributed to various factors, including the rising prevalence of cancer within the region. The increasing incidence of cancer is expected to drive the demand for metabolomics in North America throughout the forecast period.

On the other hand, the Asia-Pacific region is projected to experience the highest CAGR of 13.7% during the forecast period. The region is witnessing a significant increase in the prevalence of cancer, which contributes to the growing demand for effective metabolomics solutions. Additionally, governments in the Asia-Pacific region are focusing on the development of healthcare and pharmaceutical industries, making substantial investments in research and development. Moreover, collaborations between public and private sectors have been forged to ensure affordable treatment options in developing countries, further bolstering the growth of the metabolomics market in this region. These combined factors create a favorable environment for the expansion of the Asia-Pacific metabolomics market.

The separation methods by type market is further segmented into capillary electrophoresis (CE), gas chromatography (GC), liquid chromatography (HPLC and UPLC). According to the research, the liquid chromatography segment had the largest share in the global metabolomics market. Furthermore, the detection methods by type

market has been categorized into mass spectrometry (MS), multivariate analysis (MVA), spectroscopy (NMR and FTIR). The latest research indicates that the MS segment occupied the largest share of this market in 2022 and is expected to draw the highest demand in coming years.

#### Major Companies and Competitive Landscape

The report also provides a detailed analysis of several leading metabolomics market vendors that include Agilent Technologies Inc., Beijing Bohui Innovation Biotechnology Group Co. Ltd., BGI Group Ltd., BIOCRATES Life Sciences AG, Bio-Rad Laboratories Inc., Bruker Corporation, Chenomx Inc, Danaher Corporation, Drumetix Laboratories LLC, GERSTEL GmbH & Co.KG, LECO Corporation, Merck KGaA, Metabolomic Technologies Inc., Metabolon Inc., One Way Liver Genomics S.L. (OWL), PerkinElmer, Inc., Promega Corporation, Qiagen N.V., Shimadzu Corporation, Stemina Biomarker Discovery, Inc., Thermo Fisher Scientific Inc., Waters Corporation, among others. In this report, key players and their strategies are thoroughly analyzed to understand the competitive outlook of the market.

#### Scope of the Report

- To analyze and forecast the market size of the global metabolomics market.
- To classify and forecast the global metabolomics market based on product, indication, application, end user, region.
- To identify drivers and challenges for the global metabolomics market.
- To examine competitive developments such as mergers & acquisitions, agreements, collaborations and partnerships, etc., in the global metabolomics market.
- To identify and analyze the profile of leading players operating in the global metabolomics market.

#### Why Choose This Report

- Gain a reliable outlook of the global metabolomics market forecasts from 2023 to 2029 across scenarios.
- Identify growth segments for investment.
- Stay ahead of competitors through company profiles and market data.
- The market estimate for ease of analysis across scenarios in Excel format.
- Strategy consulting and research support for three months.
- Print authentication provided for the single-user license.

## Contents

### **PART 1. INTRODUCTION**

- 1.1 Description
- 1.2 Objectives of The Study
- 1.3 Market Segment
- 1.4 Years Considered for The Report
- 1.5 Currency
- 1.6 Key Target Audience

### **PART 2. RESEARCH METHODOLOGY**

- 2.1 Primary Research
- 2.2 Secondary Research

### **PART 3. EXECUTIVE SUMMARY**

### **PART 4. MARKET OVERVIEW**

- 4.1 Introduction
- 4.2 Drivers
- 4.3 Restraints

### **PART 5. GLOBAL METABOLOMICS MARKET BY PRODUCT**

- 5.1 Assays
- 5.2 Bioinformatics tools
- 5.3 Detection methods
- 5.4 Separation methods

### **PART 6. GLOBAL METABOLOMICS MARKET BY INDICATION**

- 6.1 Cancer
- 6.2 Cardiovascular disorders (CVDs)
- 6.3 Inborn errors of metabolism (IEMs)
- 6.4 Neurological disorders
- 6.5 Others

## **PART 7. GLOBAL METABOLOMICS MARKET BY APPLICATION**

- 7.1 Biomarker discovery
- 7.2 Drug discovery
- 7.3 Functional genomics
- 7.4 Nutrigenomics
- 7.5 Toxicology testing
- 7.6 Others

## **PART 8. GLOBAL METABOLOMICS MARKET BY END USER**

- 8.1 Academic and research institutes
- 8.2 Metabolomic service providers
- 8.3 Pharmaceutical and biotechnology companies
- 8.4 Others

## **PART 9. GLOBAL METABOLOMICS MARKET BY REGION**

- 9.1 Asia-Pacific
- 9.2 Europe
- 9.3 North America
- 9.4 MEA (Middle East and Africa)
- 9.5 Latin America

## **PART 10. COMPANY PROFILES**

- 10.1 Agilent Technologies Inc.
- 10.2 Beijing Bohui Innovation Biotechnology Group Co. Ltd.
- 10.3 BGI Group Ltd.
- 10.4 BIOCRATES Life Sciences AG
- 10.5 Bio-Rad Laboratories Inc.
- 10.6 Bruker Corporation
- 10.7 Chenomx Inc
- 10.8 Danaher Corporation
- 10.9 Drumetix Laboratories LLC
- 10.10 GERSTEL GmbH & Co.KG
- 10.11 LECO Corporation
- 10.12 Merck KGaA
- 10.13 Metabolomic Technologies Inc.



- 10.14 Metabolon Inc.
- 10.15 One Way Liver Genomics S.L. (OWL)
- 10.16 PerkinElmer, Inc.
- 10.17 Promega Corporation
- 10.18 Qiagen N.V.
- 10.19 Shimadzu Corporation
- 10.20 Stemina Biomarker Discovery, Inc.
- 10.21 Thermo Fisher Scientific Inc.
- 10.22 Waters Corporation

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