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Spatial Genomics and Transcriptomics Market - A Global and Regional Analysis: Focus on Product Type, Sample Type, Workflow, Application, End User, and Region - Analysis and Forecast, 2024-2034

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Abstracts

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This report will be delivered in 7-10 working days.Introduction of Spatial Genomics and Transcriptomics

The global spatial genomics and transcriptomics market, initially valued at $573.9 million in 2023, is set to witness substantial growth, projected to surge to $2,158.6 million by 2034, marking a remarkable compound annual growth rate (CAGR) of 12.54% over the period from 2024 to 2034. The market has been experiencing significant growth, primarily fuelled by the increasing use of spatial omics for drug discovery and development, advancements in sequencing technologies, increasing demand for high-resolution single-cell analysis, and the rising prevalence of complex diseases such as cancer and neurological disorders. Moreover, the increasing applications of spatial genomics in personalized medicine and precision oncology are expected to expand the market as researchers and clinicians seek more accurate insights into disease mechanisms at the molecular level.

Market Introduction

The global spatial genomics and transcriptomics market has been experiencing significant growth, fueled by growing investments in genomics research by government and private organizations and collaborations between biotech firms and academic institutions, and is accelerating the adoption of spatial analysis techniques. As

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investment in spatial transcriptomics continues to rise, the field is positioned for significant growth and transformative breakthroughs. The ongoing financial support will undoubtedly catalyze further advancements in spatial gene expression analysis, reinforcing its potential to reshape research paradigms and redefine the boundaries of precision medicine. For instance, in 2024, Moleculent AB secured $26 million in a Series A financing round led by ARCH Venture Partners and co-led by Eir Ventures. The company's innovative functional biology platform enables the detection and profiling of cell interactions directly within their native tissue environments. Therefore, such financial support supports technological innovations and expands spatial transcriptomics applications in various research domains.

Industrial Impact

The spatial genomics and transcriptomics market has significantly influenced the healthcare landscape, driven by key players such as 10x Genomics, Illumina, Inc., and Akoya Biosciences, Inc. These companies are at the forefront, providing cutting-edge platforms for spatially resolved genomic and transcriptomic profiling.

Moreover, the market has been further shaped by strategic collaborations, mergers, and R&D investments, which enable companies to expand their global presence and introduce innovative solutions. With the increasing focus on understanding tissue architecture and disease mechanisms, the competitive landscape of the spatial genomics and transcriptomics market is dynamic, with innovation and customer-centric approaches driving differentiation and growth.

Market Segmentation for Spatial Genomics and Transcriptomics Market:

Segmentation 1: by Product Type

Kits and Assays

Sample Preparation Kits

Sample Enrichment Kits

Instrument

Slide Scanner

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Microscopy

Mass Cytometry

Software

Services

Kits and Assays Segment to Dominate the Spatial Genomics and Transcriptomics Market (by Product Type)

Based on product type, the global spatial genomics and transcriptomics market was led by the kits and assays segment, which accounted for the largest share in 2023 and is expected to reach $1,116.2 million by 2034, registering a CAGR of 12.27% during the forecast period 2024-2034. This dominance can be attributed to their essential role in spatial analysis workflows, providing critical reagents and tools for sample preparation, staining, and detection. With applications spanning single-cell analysis, tissue profiling, and drug discovery, these products have become indispensable across research areas such as oncology, immunology, and neuroscience. Additionally, the services segment has gained traction, as many institutions and pharmaceutical companies increasingly rely on outsourcing services for customized analysis, data interpretation, and biomarker discovery. This combination of robust product offerings and expanding service capabilities is expected to propel the overall growth of the spatial genomics and transcriptomics market in the coming years.

Segmentation 2: by Sample Type

Fresh Frozen Tissues

Fixed Frozen Tissues

Formalin Fixed Paraffin Embedded (FFPE) Tissues

Cultured Cells

Fresh Frozen Tissues Segment to Dominate the Spatial Genomics and Transcriptomics Market (by Sample Type)

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Based on sample type, the global spatial genomics and transcriptomics market was led by the fresh frozen tissues segment, which accounted for the largest share in 2023 and is expected to reach $1,131.8 million by 2034, registering a CAGR of 12.40% during the forecast period 2024-2034. Fresh frozen tissues are biological tissues that are frozen immediately after collection to preserve their molecular integrity. The segmental growth is primarily driven by the need to preserve tissue with intact morphology, proteins, DNA, and RNA for clinical research and diagnostic applications. Fresh frozen tissues maintain structural integrity and provide optimal permeabilization conditions, which are critical for research experiments. Leading companies such as 10x Genomics and Akoya Biosciences, Inc. offer advanced imaging technologies and solutions tailored for fresh frozen tissue types, further accelerating market expansion.

Segmentation 3: by Workflow

Spatial Imaging

Laser Capture Microdissection (LCM)

Immunohistochemistry (IHC)

Fluorescent In-Situ Hybridization (FISH)

Microscopy

Barcodes

Other

Spatial Sequencing

Next-Generation Sequencing (NGS)

In-Vivo Transcription

Fluorescent In-Situ Sequencing (FISSEQ)

Microtomy Sequencing

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Other

Spatial Analysis

Data Visualization Tools

Data Analysis Tools

Spatial Imaging Segment to Dominate the Spatial Genomics and Transcriptomics Market (by Workflow)

Based on workflow, spatial imaging accounted for the largest share in 2023 and is expected to reach $1,095.7 million by 2034, registering a CAGR of 12.29% during the forecast period 2024-2034. Spatial imaging enables the exploration of the spatial organization of genetic material (DNA) and gene [removed]RNA) within their native tissue environment. The segment has experienced significant growth, driven by innovations in imaging technologies, mass cytometry, and mass spectrometry. Additionally, advancements in artificial intelligence (AI) and machine learning (ML) have further improved the accuracy and efficiency of image reconstruction, making real-time spatial imaging increasingly viable. By harnessing large datasets and adaptive learning algorithms, AI and ML address existing limitations, enhancing image processing and interpretation with greater precision and speed.

Segmentation 4: by Application

Diagnostics

Cancer Diagnostics

Neurology Diagnostics

Immunology Diagnostics

Other Diagnostics

Translation Research

Drug Discovery and Development

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Single Cell Analysis

Cell Biology

Other

Drug Discovery and Development Segment to Dominate the Spatial Genomics and Transcriptomics Market (by Application)

Based on application, the drug discovery and development segment accounted for the largest share in 2023 and is expected to reach $688.4 million by 2034, registering a CAGR of 12.47% during the forecast period 2024-2034. The segment is majorly driven by the adoption of spatial technologies in identifying novel drug targets, understanding disease pathways, and optimizing preclinical studies through spatial insights into tissue microenvironments. Further, the growth of the market can be attributed to the high throughput techniques required for the discovery of therapeutic targets for drug development. Moreover, the advent of spatial biology, including gene expression microarray and high-throughput RNA-sequencing in clinical and drug research, has also furthered the market's growth.

Segmentation 5: by End User

Academic Institutes and Research Institutes

Biopharmaceutical and Biotechnology Companies

Contract Research Organization

Others

Academic Institutes and Research Institutes Segment to Dominate the Spatial Genomics and Transcriptomics Market (by End User)

Based on end user, academic institutes and research institutes accounted for the largest share in 2023 and are expected to reach $925.4 million by 2034, registering a CAGR of 12.47% during the forecast period 2024-2034. Academic and research

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institutions are among the primary end users of the spatial genomics and transcriptomics market. Research organizations constitute integral facilities for companies as well as independent academic research facilities. In the research laboratories, potential biomarkers are identified, and drugs are developed while acquiring targets through spatial analysis. In addition to this, research organizations are also responsible for exploring new opportunities for advancing gene expression analysis and capabilities.

Segmentation :6 by Region

North America

U.S.

Canada

Europe

Germany

U.K.

France

Italy

Spain

Rest-of-Europe

Asia-Pacific

China

Japan

India

Australia

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Singapore

Rest-of-Asia-Pacific

Latin America

Brazil

Mexico

Rest-of-Latin America

Middle East and Africa

In the spatial genomics and transcriptomics market in 2023, the North America region dominated the global market, and it is expected to hold its dominance throughout the forecast period 2024-2034. This can be attributed to several key factors, including various technological innovations, drug discovery, and increasing research activities. In North America, several established spatial biology companies are focusing on expanding their portfolio in spatial genomics and transcriptomics instruments and kits. They are collaborating with service providers and pharmaceutical giants to co-market sequencing solutions with their complementary precision medicine solutions. Moreover, the availability of investors and venture capitalists capable of investing in the development of precision drugs and providing funds to start-ups in spatial biology has been furthering the market's growth.

Recent Developments in the Spatial Genomics and Transcriptomics Market

In July 2024, Illumina, Inc. announced the acquisition of Fluent BioSciences, a developer of innovative single-cell analysis technology. Fluent BioSciences has developed a unique single-cell analysis technology that eliminates the need for complex and expensive instrumentation and microfluidic consumables. This acquisition aligns with Illumina's broader strategy to advance its multiomics capabilities, particularly in single-cell research.

In May 2024, 10x Genomics launched a 5,000-plex gene panel for its Xenium platform, enabling researchers to analyze thousands of genes simultaneously in

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situ. The expanded gene panel offers unprecedented depth and detail, accelerating discoveries in tissue biology and disease mechanisms.

In January 2024, Akoya Biosciences, Inc. and Thermo Fisher Scientific announced a license and distribution agreement to deliver a spatial multiomics workflow. This collaboration combines Thermo Fisher's ViewRNA technology with Akoya's spatial biology solutions, enabling rapid, whole-slide imaging of RNA and protein biomarkers.

Demand – Drivers, Challenges, and Opportunities

Market Drivers:

Increasing Use of Spatial Omics for Drug Discovery and Development: The field of drug discovery and development is undergoing a transformative shift with the growing integration of spatial omics technologies, which are enabling a deeper and more accurate understanding of disease biology, therapeutic targets, and biomarkers of disease and therapeutic response. Traditional drug development heavily relied on bulk tissue samples, which often provided limited insights due to their inability to capture the heterogeneous nature of disease pathology. With the advent of spatial omics, including techniques such as digital spatial profiling (DSP), research scientists can now perform high-resolution, in situ analysis of RNA, DNA, and protein expression, offering unprecedented spatial context to the molecular landscape of disease tissues.

Market Challenges:

Lack of Skilled Professionals: A significant restraint in adopting and expanding spatial genomics and transcriptomics technologies is the lack of a skilled workforce. Clinical genomics laboratories, critical for implementing these advanced techniques, are already facing acute staff shortages, particularly in the U.S. As per an article titled ‘ Exploring current challenges in the technologist workforce of clinical genomics laboratories,’ published in 2023, while medical technologists play a vital role in laboratory operations, the specialized nature of spatial genomics and transcriptomics demands expertise in both molecular biology and bioinformatics. This dual proficiency is not commonly available, further exacerbating workforce challenges.

Market Opportunities:

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Integration of Artificial Intelligence in Spatial Genomics and Transcriptomics: The spatial genomics and transcriptomics market presents a significant opportunity driven by advancements in computational tools designed to enhance and impute spatial gene expression. These tools, leveraging cutting-edge artificial intelligence (AI) and deep learning technologies, are transforming data resolution and accuracy, addressing critical technical challenges in spatial transcriptomics (ST) analysis.

How can this report add value to an organization?

Product/Innovation Strategy: The global spatial genomics and transcriptomics market has been extensively segmented based on various categories, such as product type, sample type, workflow, application, end user, and region.

Growth/Marketing Strategy: Mergers, acquisitions, and product launches accounted for the maximum number of key developments.

Competitive Strategy: The global spatial genomics and transcriptomics market has numerous established players with product portfolios. Key players in the global spatial genomics and transcriptomics market analyzed and profiled in the study involve established players offering products for spatial genomics and transcriptomics.

Methodology

Key Considerations and Assumptions in Market Engineering and Validation

The base year considered for the calculation of the market size is 2023. A historical year analysis has been done for the period FY2020-FY2022. The market size has been estimated for FY2023 and projected for the period FY2024-FY2034.

The scope of this report has been carefully derived based on interactions with experts in different companies across the world. This report provides a market study of upstream and downstream products of the spatial genomics and transcriptomics market.

The market size was estimated and validated using both bottom-up and top-down analyses. The market size for each product type and end user was estimated for the bottom-up approach. These were further added to cumulate the global spatial genomics and transcriptomics market size.

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The top-down analysis was conducted to determine the market contributions of various segments defined in the scope.

The market has been mapped based on the available spatial genomics and transcriptomics. This report has considered and profiled all the key companies with significant offerings in this field.

The base currency considered for the market analysis is US$. Currencies other than the US$ have been converted to the US$ for all statistical calculations, considering the average conversion rate for that particular year.

Primary Research:

The primary sources involve industry experts in spatial genomics and transcriptomics, including the market players offering products and services. Resources such as CEOs, vice presidents, marketing directors, and technology and innovation directors have been interviewed to obtain and verify both qualitative and quantitative aspects of this research study.

The key data points taken from the primary sources include:

validation and triangulation of all the numbers and graphs

validation of the report’s segmentation and key qualitative findings

understanding the competitive landscape and business model

current and proposed production values of a product by market players

validation of the numbers of the different segments of the market in focus

percentage split of individual markets for regional analysis

Secondary Research

Open Sources

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Certified publications, articles from recognized authors, white papers, directories, and major databases, among others

Annual reports, SEC filings, and investor presentations of the leading market players

Company websites and detailed study of their product portfolio

Gold standard magazines, journals, white papers, press releases, and news articles

Paid databases

The key data points taken from the secondary sources include:

segmentations and percentage shares

data for market value

key industry trends of the top players of the market

qualitative insights into various aspects of the market, key trends, and emerging areas of innovation

quantitative data for mathematical and statistical calculations

Key Market Players and Competition Synopsis

The companies profiled have been selected based on inputs gathered from primary experts, who have analyzed company coverage, product portfolio, and market penetration.

Some prominent names established in this market are:

10x Genomics.

Bruker Corporation

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Akoya Biosciences, Inc

Bio-Techne.

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