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Peripheral Blood Mononuclear Cells Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Product (Cryopreserved or Frozen PBMC, Cultured or Fresh PBMC, and Peripheral Blood Mononuclear Cell Isolation & Viability Kits), By Application (Immunology, Hematology, Infectious Disease, Hematology, and Others), By Techniques (Density Gradient Centrifugation, Leukapheresis, and Others), By Source (Human, Animals), By Region, Competition, Forecast and Opportunities

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Abstracts

Global peripheral blood mononuclear cells market was valued at USD 235.68 million in 2022 and is anticipated to grow at a CAGR of 10.39% during the period 2023-2028 owing to the rising rate in the number of cell therapies, high demand of research, and development for toxicology testing and reaction mechanism of the compound responsible for new and stable development of products. For instance, in June 2023, a study published in the National Library of Medicine assessed the immune response of peripheral blood mononuclear cells (PBMC) that were infected in vitro with the Colombian strain (Col) of Trypanosoma cruzi and treated with Benzonidazole.

Peripheral blood mononuclear cells (PBMCs) are a type of blood cell that plays a crucial role in the immune system. PBMCs are a heterogeneous population of cells that are isolated from the peripheral blood, which is the blood circulating throughout the body. They are composed of lymphocytes, monocytes, and other immune cells. Lymphocytes

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are a type of white blood cell that includes T cells, B cells, and natural killer (NK) cells. T cells are responsible for cell-mediated immune responses, B cells produce antibodies for humoral immune responses, and NK cells are involved in the innate immune system and killing infected or cancerous cells. Monocytes are another type of white blood cell that circulates in the bloodstream and can differentiate into macrophages or dendritic cells when they migrate into tissues. Macrophages are responsible for engulfing and destroying foreign substances, dead cells, and cellular debris, while dendritic cells play a critical role in initiating and regulating immune responses by presenting antigens to T cells. The isolation and characterization of PBMCs have revolutionized the understanding of the immune system and have contributed to advancements in various fields, including cancer research, infectious diseases, autoimmune disorders, and transplantation medicine.

PBMCs are widely used in various research applications, including immunology, cell therapy, vaccine development, and drug discovery. They provide valuable insights into immune responses, allow researchers to study various immune cell populations, and serve as a source of cells for cell-based therapies. PBMCs can be isolated from peripheral blood using techniques such as density gradient centrifugation or specialized cell separation methods.

Additionally, the rise in number of cell therapies, expansion in research & development schemes, increasing focus of key players on R&D in peripheral blood mononuclear cells, increasing focus on regenerative medicine, as well as an increase in demand for cell operations among the population, increasing investigation of various aspects of immunology, infectious diseases, autoimmune disorders, transplantation, and vaccine development are projected to provide market players with lucrative prospects in the future.

Growing Advancement for Toxicology Research

The growing awareness of customers for peripheral blood mononuclear cells, as well as a growing preference for antibody development, are two important growth drivers for the industry. PBMC is crucial to carry out biology and pathology-related studies as well as in clinical research related to fatal diseases, immunology, vaccine development, etc. For instance, according to clinicaltirals.gov.in, 972 studies have been carried out for peripheral blood mononuclear cells. PBMCs provide information on the effects of prospective novel medication molecules on people, particularly on their immune systems. Drug toxicity that affects PBMCs can result in several serious, sometimes fatal toxic side effects, including immune system suppression and poisoning. Toxicology

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research aims to evaluate the potentially harmful effects of chemical substances, drugs, and environmental factors on living organisms. PBMCs are used in immunotoxicity studies to assess the impact of these substances on the immune system. By exposing PBMCs to different compounds and analyzing immune responses, researchers can determine the immunotoxic effects, including alterations in immune cell populations, cytokine production, and immune function. The demand for PBMCs in immunotoxicity research is thus increasing, contributing to the growth of the global peripheral blood mononuclear cells market.

Increasing Importance of Peripheral Blood Mononuclear Cells for Cell Therapy

Patients now have a better alternative to cell-based therapies with respect to traditional regenerative medicines, but their side effects have hindered their use among customers. In this product category, developed regions such as North America and Europe have a strong presence in cell therapies for human well-being. The population is gaining awareness regarding the use of peripheral blood mononuclear cells in cell and gene therapy. Hence, the extraction and usage of peripheral blood mononuclear cells prove to be the key driving force for market expansion. However, fatal diseases such as acute myocardial infarction, chronic heart failure, spinal cord injury, stroke, and wound healing have all been successfully treated in pre-clinical studies using the secretome of apoptotic peripheral blood mononuclear cells, which drives the market growth globally. For instance, according to the Centers for Disease Control and Prevention, around 37,300 new cases of HPV+ tumors occur each year in the U.S., accounting for 3% of all malignancies in women and 2% of all cancers in men. With the increasing prevalence of HPV in the country, companies are continuously focusing on the development of therapy and drugs to enter the US market. PBMCs serve as a valuable source of immune cells for cell therapy. They contain various types of immune cells, including T cells, B cells, and natural killer (NK) cells, which play crucial roles in immune responses and disease targeting. PBMCs provide a diverse population of immune cells that can be isolated, manipulated, and utilized in different cell therapy approaches.

Also, Adoptive Cell Transfer (ACT) is a type of cell therapy that involves the transfer of immune cells, typically T cells, into patients to target and eliminate diseases, such as cancers. PBMCs are often used as a starting material to isolate and expand specific subsets of T cells, such as tumor-infiltrating lymphocytes (TILs), tumor-associated antigen-specific T cells, or genetically engineered T cells. PBMCs provide a convenient source of T cells for ACT therapies.

Growing Investment in Research & Development for Human Well-Being

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Rapid advancements in research and development (R&D) practices and activities are propelling the growth of the market as novel cell/gene therapies/medications and new products are developed for the treatment of fatal diseases. PBMCs are a reasonable way to acquire physiologically relevant (immune) proteins from routinely collected blood samples, and they do so without the native human plasma's well-known analytical challenges brought on by the presence of highly abundant proteins for driving the growth of the market. Furthermore, the government of different countries, for their growth in the healthcare sector, are providing funds for the ongoing research of peripheral blood mononuclear cells.

Additionally, the growing awareness of the potential of PBMCs in disease research has led to increased R&D activities and contributed to market growth. PBMCs play a crucial role in drug discovery and development. They are utilized in early-stage research to assess the efficacy and safety of potential drug candidates. PBMCs provide a human-relevant model for studying immune responses and evaluating the effects of new compounds on immune cells. The growing awareness of the value of PBMCs in drug discovery has resulted in increased demand and utilization of these cells, driving the growth of the PBMCs market. The awareness of the therapeutic potential of cell-based therapies has been growing rapidly. PBMCs are essential in the development and manufacturing of cell-based therapies, such as adoptive cell transfer, CAR-T cell therapy, and immunotherapies. The therapeutic benefits of these advanced therapies, coupled with the increasing awareness of PBMCs' role in their development, have led to significant R&D efforts and the growth of global peripheral blood mononuclear cells market. There has been a notable increase in collaboration between academic institutions, research organizations, and the biopharmaceutical industry. This collaboration has fostered knowledge exchange, joint research projects, and funding initiatives focused on the application of PBMCs in various areas of research. The growing awareness of the potential of PBMCs and the collaborative efforts in R&D have positively impacted the growth of the global peripheral blood mononuclear cells market.

Market Segmentation

The global peripheral blood mononuclear cells market is segmented based on product, application, technique, source, region, and competitive landscape. Based on the product, the market can be split into cryopreserved or frozen PBMC, cultured or fresh PBMC, and peripheral blood mononuclear cell isolation & viability kits. Based on application, the market can be divided into immunology, hematology, infectious disease, and others. Based on techniques, the market is divided into density gradient

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centrifugation, leukapheresis, and others. In terms of sources, the market can be categorized into humans and animals.

Company Profiles

Charles River Laboratories International, Inc., Lonza Group AG, Corning Inc, Bio-Rad Laboratories Inc, ABCAM, Biolegend Inc, ZEN-Bio Inc, DAPCEL, Inc., Creative Bioarray, iXCells Biotechnologies USA, LLC, Miltenyi Biotec B.V. & CO. KG, STEMCELL Technologies Inc., Precision Medicine Group, LLC, StemExpress, LLC, RayBiotech Life, Inc., REPROCELL Inc., Cytologics LLC, BioIVT LLC, Biopredic International, and Cell Applications, Inc. etc. are among the major players in the global peripheral blood mononuclear cells market.

Report Scope:

In this report, Global Peripheral Blood Mononuclear Cells Market has been segmented into the following categories, in addition to the industry trends, which have also been detailed below:

Peripheral Blood Mononuclear Cells Market, By Product:

Cryopreserved or Frozen PBMC

Cultured or Fresh PBMC

Others

Peripheral Blood Mononuclear Cells Market, By Application:

Immunology

Hematology

Infectious Disease

Others

Peripheral Blood Mononuclear Cells Market, By Techniques:

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Density Gradient Centrifugation

Leukapheresis

Others

Peripheral Blood Mononuclear Cells Market, By Source:

Human

Animal

Peripheral Blood Mononuclear Cells Market, By Region:

North America

United States

Canada

Mexico

Europe

Germany

France

United Kingdom

Italy

Spain

Asia-Pacific

China

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India

South Korea

Australia

Singapore

South America

Brazil

Argentina

Colombia

Middle East & Africa

UAE

Saudi Arabia

South Africa

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in global peripheral blood mononuclear cells market.

Available Customizations:

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:

Company Information

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

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