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Global Peripheral Blood Mononuclear Cells Market Assessment, By Product [Cryopreserved or Frozen PBMC, Cultured or Fresh PBMC, PBMC Isolation & Viability Kits], By Application [Immunology, Hematology, Vaccine Development, Toxicology, Infectious Disease, others], By Techniques [Density Gradient Centrifugation, Leukapheresis, Others], By Source [Human, Animal], By Region, Opportunities, and Forecast, 2016-2030F

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Abstracts

The Global Peripheral Blood Mononuclear Cells (PBMCs) Market is projected to reach USD 273.28 million by 2030 from USD 589.84 million in 2022, growing at a CAGR of 10.09% for the forecast period between 2023 and 2030. Multiple factors are contributing to the growth of the global peripheral blood mononuclear cells market such as the growing demand for PBMCs for antibody development to enhance immunity and comprehend various biological and pathological processes in the body.

Additionally, PBMCs are widely used in clinical research studies related to immunology as these cells are a mixture of different immune cell types, including lymphocytes (T cells and B cells) and monocytes. By studying PBMCs, researchers can gain insights into the functioning of the immune system as a whole and understand how different immune cell populations interact and respond to various stimuli. Apart from this, PBMCs are easily available, accessible at low cost to facilitate research. Owing to this, the demand for PBMCs among researchers and scientists is high and are the prime end-users of these cells.

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Researchers in academic institutions, pharmaceutical companies, biotechnology firms, and other research organizations are the primary end users of PBMCs. They require PBMCs to investigate various aspects of immunology, infectious diseases, autoimmune disorders, transplantation, vaccine development, and other areas of biomedical research. Thus, the expansion of research and development programs launched by various governments and commercial organizations throughout the world is augmenting the demand for PBMC, resulting in driving the market growth.

Increasing Use of PBMCs for Cell Therapy

Cell therapy has gained significant attention from investors, pharmaceutical companies, and biotechnology firms. There has been a substantial increase in funding for research and development in the field of cell therapies, which has accelerated the translation of promising preclinical and clinical findings into viable treatments. Moreover, North America and Europe have aging populations facing a higher prevalence of chronic and age-related diseases. Cell therapy holds great promise in addressing some of these unmet medical needs. As traditional treatment options fall short in providing effective solutions, patients, healthcare providers, and policymakers are increasingly looking towards cell-based therapies as a potential means of delivering transformative outcomes.

Additionally, PBMCs are used to assess immune responses in both preclinical and clinical stages of cell therapy development. Researchers may collect PBMCs from patients before and after treatment to evaluate changes in immune cell populations, cytokine production, or other immune parameters.

Increase in R&D

As novel cell/gene therapies/medications and new products are being developed for the treatment of fatal diseases, R&D, clinical trials, and other activities are advancing at a rapid rate, driving the market's growth. PBMCs simplify the process of drawing blood samples for physiologically relevant proteins, without the analytical challenges of native human plasma originating from the presence of highly abundant proteins. Governments around the globe are also investing heavily in peripheral blood mononuclear cells. The number of publications made on PBCMs in clinical research has accelerated over the last 10 years by twofold.

Growing Rate of Toxicology Research

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Two key growth factors for the market's expansion are consumers' rising need for peripheral blood mononuclear cells and their rising preference for antibody development. To comprehend the biological and pathological processes, as well as in clinical research, research on fatal illnesses, immunology, vaccine creation, etc., PBMC cell investigation is essential. The impacts of potential new drug compounds on humans, particularly on their immune systems, are shown by PBMCs. Immune system suppression and poisoning are only a couple of the major, occasionally deadly toxic side effects of drug toxicity that affects PBMCs.

Advancement with Peripheral Blood Mononuclear Cells

PBMCs are a source of cells to promote osteochondral lesions' recovery. One of the benefits of PBMC treatment is that, unlike other sources of multipotent cells, peripheral blood cell separation is less invasive and isn’t needed for general anesthetic. BioIVT, a renowned company specializing in research models and services for the advancement of drugs and diagnostics, has revealed its collaboration with Promega Corporation. The collaboration involves BioIVT supplying peripheral blood mononuclear cells (PBMCs) for Promega's latest PBMC Antibody-Dependent Cellular Cytotoxicity (ADCC) Bioassay. This innovative bioassay employs PBMCs to replicate in vivo scenarios and evaluate the ADCC capabilities of antibodies during the process of drug development and characterization.

The PBMC ADCC Bioassay, in conjunction with Promega technologies, introduces a pioneering kit that includes PBMCs qualified for ADCC assessments. The kit is designed with a user-friendly add-mix-read process and a highly sensitive luminescent readout, ensuring a reliable range for assay results. With multiple assay formats available, the kit offers ADCC-qualified PBMC effector cells and allows the selection of target cells expressing a HiBiT fusion protein, catering to different preferences. When target cells are eliminated, a vivid luminescent signal is produced, indicating successful killing.

Impact of COVID-19

The COVID-19 pandemic caused significant disruption to the peripheral mononuclear blood cells industry. Peripheral mononuclear blood cells are a critical component of the immune system and are used in a variety of research applications, including drug discovery and vaccine development. With the outbreak of COVID-19, there has been a surge in demand for PBMCs from researchers working to develop treatments and vaccines for the virus. This has led to a shortage of PBMCs and an increase in their

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cost. Additionally, the pandemic has disrupted supply chains, causing delays in the transportation and processing of PBMCs. The closure of research labs and universities due to lockdowns and social distancing measures has also reduced the demand for PBMCs in non-COVID research, further impacting the market.

Key Players Landscape and Outlook

As per the findings of a clinical trial conducted at the University of Colorado Cancer Centre, a microfluidic squeezing technology used on PBMCs aids in stimulating anti-tumor activity in a subtype of HPV16-positive cancers (such as head, neck, cervical, and anal cancers), thus speeding up the process.

In 2022, Purigen Biosystems launched ionic cells to pure DNA kits for white blood cell and peripheral mononuclear cell control samples. The new kit has been optimized to extract higher yields of high-quality DNA from white blood cells, peripheral blood mononuclear cells, and cultured or sorted cells.

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