

# Global Cancer Vaccines Market & Pipeline Analysis

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## Abstracts

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Cancer vaccines are a viable option for treating many types of cancers which in the present day do not have effective treatments. Therapeutic cancer vaccines and Prophylactic cancer vaccines are the two broad segments into which the cancer vaccines market is categorized. Therapeutic or Treatment vaccines are targeted at treating an existing cancer by strengthening the body's natural defences against the cancer and the Prophylactic or Preventive vaccines are used to prevent cancer from developing in healthy people. With the approval of the expensive prostate cancer vaccine, Provenge by Dendreon, the field of cancer vaccines has received an unprecedented boost. Consequently, many companies are expected to enter this emerging and highly profitable field of preventing, treating, and potentially curing cancer.

With the increasing focus of pharmaceutical companies in the cancer vaccine segment, the prophylactic vaccines segment grew substantially and currently is the largest source of revenue, with the therapeutic vaccines segment still remaining untapped. It is most likely that the regulatory authorities would in the near future quicken its approval process specifically for therapeutic vaccines. This coupled with a significant amount of investment for the research and development of these vaccines by the pharmaceutical companies would certainly push the overall cancer vaccines market onto a rapid growth trajectory.

The current market size of cancer vaccines category is many fold smaller than other cancer therapeutics categories. Due to nascent stages of industry-life cycle and late introduction in market has decreased their overall share. To tap this cancer market category, many global companies are actively investing in cancer vaccine development. The market penetration is expected to increase with the competition among various

pharmaceutical companies to get a larger portion of this market category.

The capital investments in many sections are required for the development and introduction of new cancer vaccines in market. The present market has handful of cancer vaccines for preventive and therapeutic categories. The limited options to choose from these products have significantly limited the pharmaceutical companies' profit margins. On the other hand, many companies are developing cancer vaccine for both of these categories. The introduction of new products will also alleviate the financial burden from the patients.

The cancer vaccine pipeline is expected to increase at tremendous rates in coming years. As large numbers of cancer vaccines are entering in various phases of clinical trials, due to which cancer market will soon observe a boost. However, the novelty of cancer vaccines makes it difficult for the standardization of clinical trials, because the criterias required to quantify its effectiveness are not completely discovered, this cause loss of valuable time. Moreover, the present day methods are standardized for conventional cancer therapeutic methods like chemotherapy, radiotherapy and surgery, which are not applicable for cancer vaccines due to their different mode of actions. In near future, researchers will find the solution for this problem and it will decrease the winding time.

### **“Global Cancer Vaccines Market & Pipeline Analysis” Report Highlights:**

Global Cancer Market Overview

Personalized Cancer Vaccines: Progress & Possibilities

Platforms for Cancer Vaccines Delivery

Cancer Vaccines: Mechanism & Innovations

Global Cancer Vaccines Clinical Pipeline by Phase, Indication, Company & Country

Global Cancer Vaccine Clinical Pipeline: 289 Vaccines

Marketed Cancer Vaccines: 12 Vaccines

Regulatory Framework for Cancer Vaccines Development & Marketing



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## About

Every day numerous cancer cells are produced in human bodies, but they don't culminate as cancer due to body's immune system search, target and destroys capabilities. In some individuals due to various factors, like genetic and environmental cancer is developed. Recently, understandings about these factors were deciphered, which lead to the development of various cancer therapeutics including cancer vaccines. The research and development of these vaccines have seen a significant growth in past few years. The statistically significant data obtained from clinical studies have confirmed the ability of cancer vaccines' safety and efficacy. The main challenge with the development of cancer vaccines is the limited information about exact mechanism of immune system's working. The administration of these drugs leads to different results in different individuals due to known factors may be genetics could play a major role. Increased knowledge will help in pin-pointing the exact area, where more emphasis should be given for better results.

A tumor is defined as cancer when it has become malignant in nature i.e., it spreads to the other parts of body. It was found that the surfaces of these tumors have a unique antigen, which is known as tumor associated antigen (TAA). To tap this information, a complementary molecule to TAA was developed with a cytotoxic antigen, but it showed limited growth inhibiting abilities. These TAAs are small proteinaceous molecules developed during transformation of normal cells to cancer cells. It was also found that different tumors have different TAAs, which can be targeted to develop a specific cancer vaccine. Owing to these uniqueness and specificity normal cells are spared, while cancerous cells are killed.

The human immune system consists of cytotoxic T-lymphocytes (CTLs), which are responsible for identifying and eradicating cancer cells from the body. Researchers used them to target over expressing TAAs for identification and guided destruction of tumor cells. However, the cancer cells are bodies own cell with mutations in DNA, as they are derived from normal cells, they are highly efficient in evading T-lymphocyte's scrutiny. But the advent of cancer vaccines to target tumors cells helped in limiting the tumor growth.

The clinical trials are targeted to find the immune response of body to the cancer vaccine. After administration, researchers look for the number of CTLs, it gives a rough measure of the efficiency against the cancer cells. In addition, there are numerous lymphocytes such as natural killer (NK) cells, lymphokine-activated killer cells and tumor-



infiltrating lymphocytes which are not CTLs but they have cytotoxic abilities. Also, it has been observed that the number of CTLs is not directly correlated to the cancer vaccine's efficiency, so the number of different types of lymphocytes is also considered in clinical trials.

The CTL generation requires two signals: presence of antigen presenting cells (APCs) and co-stimulation delivered by APCs. The APCs are produced as a part of Human leukocyte antigen (HLA), whose surface carries a protein on the surface for identification of cancer cells. Co-stimulation is required for the proliferation and activation of T-cells; otherwise they will not be able to halt tumor's growth.

Investigators try to use these criterias to develop cancer vaccines with higher efficacy. The goal of cancer vaccine strategies is to prevent and cure cancer from the body. For this purpose, various methodologies utilizing different sources of origin, principles and technologies are being developed.

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