

# Cancer Nanomedicine Market & Pipeline Insight 2015

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## Abstracts

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During the last decade, there has been significant impact of the emergence of nanotechnology on clinical therapeutics. The pharmaceutical industry has witnessed advances in biocompatible nanoscale drug carriers in the form of liposomes and polymeric nanoparticles which have the potential to deliver numerous drugs with more efficiency and safety. The advantages of nanoparticle drug delivery, specifically, at the systemic level, include longer circulation half-lives, improved pharmacokinetics and reduced side effects which are major reasons for its increasing popularity. In the field of cancer therapy, the nanoparticles could possibly depend heavily on the enhanced permeability and retention effect which is caused by leaky tumor vasculatures for better drug accumulation at the tumor sites. Owing to such benefits, the therapeutic nanoparticles as a form of drug delivery has become a very promising field and has the potential to successfully replace traditional chemotherapy.

Scientists and engineers have been specifically researching on discovering different approaches to deliver multiple therapeutic agents using a single drug nanocarrier. Given the fact that application of multiple drugs could possibly suppress the notorious phenomenon of cancer chemo-resistance, these efforts have been motivated to a great extent. It has been observed that the cancer cells tend to exhibit a diminishing response over the course of a chemo-treatment because they acquire defense mechanisms by over expressing drug efflux pumps, increasing drug metabolism, enhancing self-repairing ability or expressing altered drug targets. In order to reduce the cancer drug resistance for better therapeutic effectiveness, the “combination chemotherapy” has been adopted for a long time in the clinics as a primary cancer treatment regimen.

While on the one hand, applying multiple drugs with different molecular targets could possibly raise the genetic barriers needed to be overcome for cancer cell mutations,

thereby delaying the cancer adaptation process. On the other hand, it has been proved that multiple drugs targeting the same cellular pathways could sometimes function synergistically for higher therapeutic efficacy and higher target selectivity. However, there are many shortcomings in the current combination chemotherapies. These include varying pharmacokinetics, biodistributions and membrane transport properties among different drug molecules which tend to make dosing and scheduling optimization extremely difficult. These challenges have made the researchers and clinicians to investigate more efficient approaches to incorporating nanotechnology with combination chemotherapy.

The future years are expected to be bright with regards to the development of nanoparticle drug delivery systems for cancer treatment. The identification of nanoparticle materials which are relatively safe and effective in delivering therapeutic agents to the target tumor sites is the need of the hour. The protein polymers from natural sources are considered to be promising materials for constructing the nanocarrier systems. With the commercial success of albumin-based nanoparticles, there has been significant amount of interest in other proteins also. By rationally designing protein nanoparticles based on their behaviors in the tumor microenvironment and based on cancer cell biology, improved efficacy and safety of cancer therapy can be achieved.

#### “Cancer Nanomedicine Market & Pipeline Insight 2015” Report Highlight

Nanomedicine for Cancer Therapies

Cancer Nanoparticles Drug Delivery Systems Classification

Mechanism of Cancer Nanomedicine Therapy

Cancer Nanomedicine Clinical Pipeline Overview

Cancer Nanomedicine Clinical Pipeline by Company, Indication & Phase

Cancer Nanomedicine Clinical Pipeline: 79 Drugs

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Abraxis BioScience, Access Pharmaceuticals, Alnylam Pharmaceuticals, Arrowhead Research, BIND Biosciences, Epeius Biotechnologies, Nanobiotix, NanoCarrier, Nippon Kayaku, Samyang, Takeda Pharmaceutical

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