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Small Molecule Cancer Drug Clinical Pipeline Insight

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Abstracts

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Oncologists are continuously looking for better therapeutic options to effectively cure and prevent different types of malignancies. Conventionally, surgery and radiation were widely used for cancer treatment but they have modest benefits. Presently, global market consists of several options for cancer treatment which belongs to various classes of molecules. Their utilization in therapeutic regime depends on the patient's medical condition, pharmacological and financial benefits offered by them during treatment. Out of these classes of therapeutic molecules, small molecules have been found to have substantial impact on cancer treatment due to which they are widely accepted by oncologists and patients.

Small molecules are widely used for cancer treatment because they can easily infiltrate into the tumorous cells and prevent its proliferation. Chemotherapeutic drugs are also small molecules, generally used in cancer treatment for several decades. They are still used as first line cancer therapeutics and they have highly developed cancer market. Chemotherapeutics have helped in decreasing the mortality rates but their severe side effects cause high morbidity rates. This fact made the researchers to search for other small molecules which can provide better pharmacological effects with minimized side effects in cancer patients. As a result, after several decades of research newer small molecules belonging to different classes have been formulated for cancer treatment.

High versatility is another benefit offered by small molecule due to which they can be used for the treating different types of cancers. Research in this field is progressing and several molecules are under investigation for their pharmacological efficacy. Conventional therapies in cancer of sensitive tissue may have life threatening effects instead of therapeutic benefit. For instance, a newly discovered molecule called TIC10 has been found as a potential treatment against brain tumour. It is under development

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at laboratory phase and someday it may enter in clinical trials in coming years. Many other small molecules are under development for the treatment of Non-Small Cell Lung Cancer (NSCLC), Colon cancer, Breast and other cancers.

Development of small molecule cancer drug generally involves target identification and pharmacological efficacy provided during clinical trials. Different types of cancer have different physiological characteristics due to which effective treatment requires the small molecule showing preferential selectiveness towards a particular cell group. Technological limitations are one of the biggest hindrances in the speedy development of small molecules for cancer treatment but this is expected to be overcome with time due to increased investments in research and development segment. New small cancer drugs based on novel technology are expected to enter in global market in coming years.

“Small Molecule Cancer Drug Clinical Pipeline Insight” Report Findings:

Role of Small Molecule Drug in Cancer Treatment

Mechanism of Small Molecule Cancer Drug

Small Molecule Cancer Drugs Market Dynamics

Small Molecule Cancer Drug Clinical Pipeline By Company, Indication & Phase

Small Molecule Cancer Drug Clinical Pipeline: 1108 Drugs

Marketed Small Molecule Cancer Drugs: 128

Majority of Drugs are in Preclinical Phase: 437 Drugs

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About

Various types of drug molecules have been discovered by pharmacologists having multiple therapeutic benefits. A group of drugs falling in the range of approximately 900 Dalton is classified as small molecule drug which have been widely used for the treatment of various ailments. They may have different range of molecular weights but all of them are considered to fall under low molecular weight by researchers. Owing to low molecular weight they can be modulated according to medical necessities providing better pharmacological effect. They have vast history of research and development as earlier molecules used by physicians tends to fall in the small molecule category.

Owing to small size they also have high absorption rates and most of them are easily soluble in variety of chemicals making them easy to administer. Small molecule drugs can be administrated through various routes like oral and intravenously among other available methods. Easy absorption, high bioavailability, and high solubility are basic factors responsible for the development of small molecule based drugs. It has been found that drug with molecular weight around 500 Dalton tends to follow all these criteria for making an effective drug.

Small drug acts as effectors and binds to ligands which tend to bring changes in the cellular machinery. Due to their involvement in cellular signalling, they can be used to bring metabolic changes to cure diseases. Some of them are found to be analogues of biological molecule which can be used to study effects of original molecule in laboratory conditions. For instance, hormone analogues are widely for cancer treatment involving hormones as cancer promoting factor in patients. On the other hand, they can also be used to decrease the synthesis of particular molecule by inhibiting enzymes involved in the process. Research done at laboratory levels may save lots of time and downstream processing due to early availability of data generated by studies on small molecules as potential drug candidate.

Many pharmaceutical products like hormones, low molecular weight protein and synthetically derived molecules are under clinical trials to find their pharmacological efficiency. It has been found that lipophilic nature of small molecules increases their bioavailability as they can easily pass through lipid membranes. Due to small size they are easily removed from the system which is counterproductive to their higher bioavailability. In such scenario, pharmacological benefits and developmental costs become the major criteria for the drug development. While easy modification makes them suitable drug candidate to target various types diseases including cancer.

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Production of small molecules is relatively easy as compared to other classes of drug molecules but that doesn't correlates to their marketing potential which depends upon their pharmacological efficiency. They could be produced biologically from genetically modified organism specialized for specific biologically active molecule. Large production could be achieved in short time but purification is somewhat difficult and time consuming process which may cause increase in price of final product. Chemical synthesis is used in many cases which is also capable of producing large quantities in shorter time. This method is widely used due to high quality of end product and more control over the process as compared to biological system leading to more cost arbitrage. However, choice of production depends upon the process offering high quality end product along with higher cost arbitrage.

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