

Pharmacy, Drug Development, and Technology

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The drug discovery and development is based on utilizing relevant methods, robust tools and models that are predictive of clinical effects in terms of prevention, diagnosis, mitigation, treatment, and prognosis. The drug development procedure starts with a target identification and validation, identification of actives (molecule that shows significant biological activity in a validated screening assay), confirmation of hits, followed by lead molecule (compound with promising pharmaceutical safety, efficacy, and optimum pharmacokinetic profile) selection and optimization. Various aspects of toxicology, pharmacodynamics, pharmaceuticals, and medicinal chemistry play a dynamic role in entire high throughput screening (HTS) procedure. Formulation of a potential drug candidate involves chemical synthesis, characterization, purification, establishing structure–activity relationship (SAR), stability determination, and formulation of drug delivery system.

Nowadays, cancer incidence rising rapidly and it's the second leading cause for mortality worldwide, accounting for an estimated 9.6 million deaths in 2018 [1]. Since cancer has arisen as a key health issue in developing countries, there is a need to reinforce preventive strategies for effective pain management and comfort to cancer patients. In the recent years, landscape of oncology drug design and development has shifted from classic chemotherapy and radiation treatment regime to rationally designed molecularly targeted agents (MTA's).

Many breakthroughs in oncology drug development have been reported and much research still goes on to eradicate this deadly disease. Few developments in the therapeutic arena of oncology are (a) tumor starvation strategies i.e. cutting of the nutritional supplies leading to increased oxidative stress ultimately causing cell death (b) nanoparticle revolution: right from detection, cure, mitigation, and prognosis, nanoparticles are being used and further researched upon to develop concrete dose delivery systems and therapeutic tendencies. The new drug delivery materials include polymeric nanoparticles, solid-lipid nanoparticles, liposomes, nanoemulsions, cyclodextrins, and dendrimers-which are being used

to encapsulate therapeutic agents and act as potent carriers to the targeted site [2]. These miniscule vehicles being compact and well suited to transverse cellular membranes to mediate drug or gene delivery. Reovirus (an oncolytic virus with immune-mediated anti-tumor activity) is being clinically developed that showed remarkable improvement in a spectrum of malignancies [3]. Genetic pharmacotherapy and immune therapy reinforces our own bodies existing arsenal against foreign bodies and harmful cells.

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