Tentative Outline Anti-Cancer Agents in Medicinal Chemistry

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Title

Advancement in anti-cancer drug discovery: Perspective of interdisciplinary research in synthetic, Natural, in silico computational chemistry, nano-anti-cancer drugs and bio-molecules based therapeutic cancer vaccine.

Background:

Cancer is a highly heterogeneous disease at intra/inter patient levels and known as the leading cause of dead worldwide. A variety of mono and combinational therapies including chemotherapy have been evolved over the years for its effective therapy. However, advent of chemotherapeutic resistance or multidrug resistance in cancer is major challenge researchers facing in its successful chemotherapy. Though, indeed there is significant raise drug discovery research to find out the new anti-cancer molecules and their effective targets yet it still far below than accomplishing the demand of safe and effective chemotherapy. This gap is because of various reasons majorly highly costly and time consuming research, followed by poor safety and undesirable physiochemical characters of developed anti-cancer molecules.

Therefore a multidisciplinary approach in research is required that should integrate the medicinal chemistry, natural compounds, synthetic chemistry, computational biology/ chemistry, and modern day nanotechnology approaches for developing anti-cancer molecules and then finally stablishing it as a cancer medicine.

Research in the area of cancer nanotechnology over the past two decade have now been proven that the smartly designed nanoparticles with targeting ligands help in successful chemotherapy through preferentially accumulate in the tumor region by mean of active and passive targeting therefore reducing the off-target accumulation of payload. Many of such nanoparticles are in different stages of clinical trials as nanomedicines showing promising results in cancer therapy including the resistant cases. Nanoparticles as chemotherapeutics carriers offer the opportunity to have multiple payload of drug and or imaging agents for combinational and theranostics therapy.

Aims & Scope:

This thematic issue present a concise yet very focus discussion to guide the research in medicinal chemistry and rational drug design for the discovery of anti-cancer agents. Particularly, synthetic and natural chemistry, in silico based computational design; targeted therapy for anti-cancer drug development will be discussed in regard to present research and the future direction. Moreover, nanotechnology based anti-cancer nano-drug development and nanomedicines for the cancer vaccination will also be addressed to give insight into the present state-of-the-art in designing the developed anti-cancer molecules that will be viable and safer for the chemotherapy. Up-coming promising field of bio-molecules (nucleic acids and proteins) used in developing therapeutic vaccine against cancer will also be covered.

Sub topics

Key area (but not limited to) that will be discuss in this issue are:
- SAR in synthetic chemistry in rational drug design for breast cancer.
- Natural chemistry advances in developing leads of anti-cancer molecules.
- Chemotherapeutics against MDR of cancer.
- Chemo-sensitizing agent in cancer therapy.
- In silico based computational design in anti-cancer drug discovery.
- Implementing the chemistry of nanoparticle synthesis in cancer diagnosis, drug delivery and theranostics.
- New challenges in the use of nanomedicine in cancer therapy
- Synergetic approach in combination of physical therapies with nanotechnology
- Current views on the factors responsible for multidrug resistance in cancer therapy and the role chemistry in developing nanomedicines to overcome cancer

resistance.
- Chemistry of nanoparticle design for biomolecule delivery in cancer.
- Therapeutic vaccine against cancer

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