Editorial

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The Age of Miraculous Technology Advent to Eradicate Cancer Cells

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Abstract—One of the most difficult global health problems is cancer. Even though there is a large collection of drugs that can be used to treat cancer, the problem is to kill all cancer cells selectively while reducing on the side toxicity of healthy cells. There are many biological obstacles to effective drug delivery such as renal, hepatic, or immune clearance. Nanoparticles laden with drugs can be designed to astound these biological barriers to advance efficacy while minimizing disturbance. Nanoparticles have been introduced into a new era of drug delivery by refining the therapeutic indicators of active pharmaceutical ingredients engineered in nanoparticles. Following generation Nano medicines requisite to be better battered to specifically destroy cancerous tissue, but face more than a few obstacles in their clinical development, containing identification of appropriate biomarkers to target, scale-up of synthesis, and reproducible characterization. This review the current use of layers of nanoparticles clinically approved, and to investigate the nanoparticles of drugs in clinical trials, in addition to challenges that may hinder the development of Nano-drugs for cancer treatment are discussed.

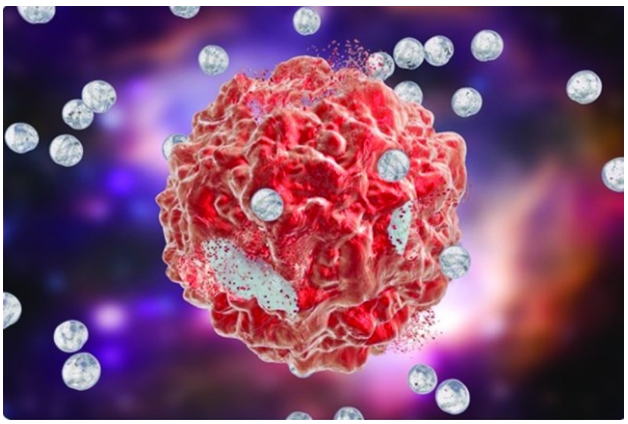
Keywords—Nanoparticles; Clinical trials; Therapeutics; Combination treatment; Theranostics.

PRECISE and premature diagnosis of the disease residues one of the greatest challenges in modern medicine; as with any advance in diagnosis, the decisive goal is to enable doctors to identify the disease as soon as possible. You can save more lives through early detection of cancer by any form of treatment in advanced stages. It is assumed to be circulating cancer cells (acute), viable cells derived from tumors, to represent the origin of the disease metastatic [1].

One of the largest technological forces swiftly changing worlds is our capability to influence objects on a smaller and smaller scale. The science that is motivating such evolution is called nanotechnology. Moreover, just as in chemistry revolution breakthroughs the 20th century, nanotechnology is doing alike in the 21st century. With nanotechnology, we are taking progress to the next level. We can now manipulate objects (and build them) at the molecular, and even atomic, levels. It is life-changing work. Nanotechnology may be able to extend our lives in two ways. It can repair our bodies at the cellular level, reverse aging, and providing a certain version of the fountain of youth, and it can help the medical community to eradicate life-threatening diseases such as stroke, heart attack, HIV, or cancer [2].

By curing life-threatening disease, nanotechnology can extend the average lifespan far beyond the remarkable achievements of the past century. For instance, the nanotechnology applications in health care are likely to minimize the number of deaths from conditions such as heart disease and cancer over the next decade or so. There are already many research programs in place working on these techniques.

For example, chemotherapy can now be applied directly to cancerous tumors, delivering treatment to the affected area only, rather than having toxic chemicals wash through the body, destroying the immune system, as well as cancer. Since we can build smaller delivery vehicles, the way the radiation therapy is used can be revolutionize. Doctors can insert a tiny gold particle into a tumor, and then, hit it with radiation until it explodes cancer [3].



We are living at the dawn of the Nano-medicine age. I believe that nanoparticles and Nano-devices will soon operate as precise drug delivery systems, cancer treatment tools, or tiny surgeons. Let me introduce you the brave, new world of nanotechnology in cancer treatment. The deliverance of drugs and diagnostic markers to cancer tissues has been a foremost challenge in the development of cancer therapies. Classical delivery methods distribute products throughout the body, disturbing healthy and cancerous cells; thereby, toxic effects to healthy cells limit the scope and effectiveness of the anticancer therapy. Targeted therapies and diagnostics provide a means of delivering more potent molecules to the cancer cells, but conventional targeted delivery methods still have many limitations [4].

As a very straightforward explanation, cancer occurs as cells refuse to die and remain multiplying in various places in our bodies while hiding from our immune systems. At present, the mainly effective treatments against cancer comprise various forms of radiation and chemotherapy, which stops the regeneration process for cells. The dilemma with chemotherapy and radiation is that it cannot be utilized in targeted ways; as a result, it has serious, sometimes even life-threatening side effects. The use of nanotechnology might mean a revolution in cancer treatment [5].

Creating drugs that directly hit cancer cells without damaging further tissues have already been proven to be a safe method in treating cervical cancer. Swedish researchers have urbanized a technique that uses magnetically controlled nanoparticles to force tumor cells to self-destruct not include harming surrounding tissue radiation and chemotherapy do. It is primarily meant for cancer treatment, although it could be used for other diseases including type 1 diabetes [6].

Curing cancer could finally turn out to be reality, appreciation to medical nanotech. Targeted chemotherapy methods based on nanotechnology use nanoparticle to deliver chemotherapy drugs. A detach nanoparticle is used to guide the drug carrier directly to the cancer tumor. Gold Nano-rods can also be introduced in circulation throughout the bloodstream. Once, they gather at the tumor site, they would concentrate the heat from an infrared light, heating up the tumor to a level where its cells die with negligible damage to the surrounding healthy cells [7], [8].

This heat could also be used to boost the level of a stress-related protein present on the tumor's surface. Then, drug-carrying liposome nanoparticles can be attached to amino acids that bind to this protein. This way, the accumulation of the liposome chemotherapy drug is speeded up by the increased level of protein at the tumor [9]. Magnetic nanoparticles attaching to cancer cells present in the bloodstream could also allow the elimination of cancer cells before they establish new tumors. A mixture of targeted delivery methods, together active and passive can enhance the concentration of a drug or diagnostic molecule in the cell while minimizing the effects on healthy cells. Nanoparticles, particles between 1 and 100 nm in size, can be engineered to contain multiple functional groups, making use of synergistic targeting strategies. Nanoparticles have become a promising new class of therapeutics for cancer diagnosis and treatment [10].

With regards,
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