Editorial

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Editorial Note on Nano Technology in Oncology

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Editorial Note

Human cells are a hundred to ten thousand times smaller than nanoscale computers. They're around the same size as enzymes and receptors, which are big biological molecules ("biomolecules").Hemoglobin, the molecule that transports oxygen in red blood cells, has a diameter of around 5 nanometers. Nanoscale devices with a diameter of less than 50 nanometers can easily penetrate most cells, whereas those with a diameter of less than 20 nanometers can easily escape blood vessels as they flow through the body.

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They have the ability to diagnose disease and provide care in previously unimagined ways by having access to so many areas of the body.
At the nanoscale, biological processes take place, including those that are important for life and those that contribute to cancer. As a result, we are made up of a slew of biological nano-machines. Researchers can analyse and modify macromolecules in real time and at the earliest stages of cancer progression thanks to nanotechnology.`

Nanotechnology has the potential to identify cancer-related molecules quickly and sensitively, allowing scientists to detect molecular changes in a small percentage of cells. Nanotechnology has the ability to create completely new and highly efficient therapeutic agents.

A good cancer drug delivery system can achieve high tumour aggregation while sparing the surrounding healthy tissues. For tumours, the Enhanced Permeability and Retention [EPR] effect (passive localization of several drugs and drug carriers due to extravasation by leaky vasculature) works very well.

As the tumour mass increases, a network of blood vessels must develop quickly to meet the tumour cells' oxygen and nutrient requirements. Angiogenesis (abnormal and poorly regulated vessel formation) results in vessel walls with large pores (40 nm to 1 um), allowing relatively large nanoparticles to extravasate into tumour masses.
To ensure high drug accumulation and thus improve treatment efficacy, the majority of current nanomedicines for solid tumour treatment depend on the EPR effect. This drug delivery mechanism is known as passive targeting because it does not target cell types that express the desired targeting ligand.