

Protein nanoparticles as drug delivery carriers for cancer therapy

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Cancer is the growing cause of death presently and there is no efficient treatment available; treatments including chemotherapy, radiotherapy, surgery, immunotherapy, etc. are existing but they lead to poor lifestyle and side effects post-treatment. To enhance the lifestyle of cancer patients by reducing side effects, researchers are now moving towards nanoparticles (NPs), especially protein NPs. Protein NPs are solid colloidal particles ranging in size between 10-1000 micrometres. Since they are natural biomolecules, they are biocompatible and biodegradable; and no toxic chemicals are involved in their preparation, which increases their efficiency. Albumin is used as an ideal protein to fabricate nanoparticles for cancer treatment. Albumin is the most soluble protein of the circulatory system and is involved in maintaining osmotic balance and transport of nutrients. The albumin-based NPs render high binding capacity of various drugs and are found to be well tolerated without causing any side-effects. They release the drug in a controlled manner and could also circulate for a longer duration in the bloodstream; and in case of solid tumours they extravasate (squeeze) through leaky tumour vasculature without affecting the normal tissues. These albumin-based NPs can release drugs naturally by protease digestion. They are proving to be better alternatives to synthetic polymer-based NPs in cancer therapy. The application of albumin-based NPs has so far produced good results in cancer treatment. Therefore, they are found to be promising carriers of anti-cancer drugs.

Keywords: Nanoparticles, Cancer treatment, Albumin-based nanoparticles, Protein nanoparticles, Cancer therapy

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