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Quinic Acid-Modified Nanoparticles

Polyol-modified nanoparticles actively interact with blood vessel linings to deliver therapeutic drugs into solid tumors, increasing drug concentration and reducing side effects compared to traditional methods.

Cancer is a group of diseases involving abnormal cell growth. Currently there are more than 100 types of identified cancer that affect human beings as well as animals. In 2016, there were an estimated 1,685,210 new human cancer cases diagnosed and 595,690 cancer deaths in the United States alone (Cancer Statistics 2016 - American Cancer Society, Inc.). Nanoparticles (NPs) have been considered a promising carrier of chemotherapeutic drugs, but are limited in delivery to tumors due to the diverse nature of the disease. There currently exists the need to leverage the enhanced permeability and retention effect to deliver NPs beyond the current levels possible.

Researchers at Purdue University have developed a method for preparing polyol-modified nanoparticles for targeted delivery to cancerous cells and tissues via transcytosis across the peritumoral endothelium. This method does not depend on the leakiness of the vasculature like traditional nanoparticle formulations, but actively interacts with the vascular lining to enter tumors.

Advantages:

-Increases the amount of drugs deliver to solid tumors

-Reduces the required dose and related side effects

-Does not depend on long-term circulation and passive extravasation

Potential Applications:

-Cancer treatment

-Drug delivery

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