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Quantum dots made from tea leaves extract for lung cancer treatment

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Quantum dots, a fundamental nanotechnology avenue, has been gaining attention in the treatment, imaging, and diagnostics of lung cancer which is one of the most common cancers in the world. Quantum dots are nanostructures created artificially and used in biological imaging and diagnostics due to their optical and electrical properties. Quantum dots made up of metals or semiconductors produce distinctive colours based on different band energy gaps. However, these metal-derived quantum dots are carcinogenic and fatal for patients due to their chemical composition. Therefore, researchers from Tamil Nadu's KS Rangasamy College of Technology and Bharathiar University collaborated with Swansea University's experts and colleagues to develop a non-toxic quantum dot utilising tea-leaf (Camellia sinensis) extract coupled with cadmium sulphate and sodium sulphide which can be used to diagnose as well as destroy cancerous cells. These nanoparticles are stabilised by the organic components found in tea leaves, such as polyphenols, proteins, amino acids, and antioxidants. Taking the tea leaves, chopping them out, washing them, and incubating them were the first steps in making the quantum dots. The quantum dots were then prepared in a two-step process, firstly adding cadmium sulphate and incubating it for three days followed by the addition of sodium sulphide and incubating it for four days, after which it was centrifuged and the other unwanted components were removed. The cytotoxic effects of quantum dots at various doses were assessed using human lung cancer cell lines grown in a medium. Due to the anti-cancer properties and inhibitory impact of the tea leaf extract-based quantum dots, the cancerous cells were found to be destroyed via apoptosis. It penetrated into the cancerous cell's nanopores and caused apoptosis, killing 80 percent of the cells effectively. These results were comparable to those seen with cisplatin, a regularly used chemotherapeutic agent, demonstrating that the efficacy of quantum dots can be scaled up to that of a chemotherapeutic therapy. So, delving more into this path could lead to plenty of alternative cancer treatments.

Keywords: Quantumdots, Lungcancer, Nanoparticles, Apoptosis, Tealeafextract

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