

# Nano-Ayurvedic Approaches for Cancer Treatment

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**Received date:** May 06, 2024, Manuscript No. IPAPCT-24-19296; **Editor assigned date:** May 09, 2024, PreQC No. IPAPCT-24-19296 (PQ); **Reviewed date:** May 23, 2024, QC No. IPAPCT-24-19296; **Revised date:** May 30, 2024, Manuscript No. IPAPCT-24-19296 (R); **Published date:** June 06, 2024, DOI: 10.36648/2321-2748.12.1.277

**Citation:** Lopez M (2024) Nano-Ayurvedic Approaches for Cancer Treatment. Am J Phytomed Clin Ther Vol.12 No.1:277.

## Description

The emerging field of nano-ayurvedic medicine involves the functionalization of nanoparticles with the active principles of potent ayurvedic herbs to improve their efficacy and target-specific delivery. Logical advances in the recent many years have uncovered the sub-atomic components behind the anticancer capability of a few ayurvedic spices, credited predominantly to their optional metabolites including polyphenols and other dynamic substances. With the progression of nanotechnology, it has been laid out that size-, shape-, and surface-science advanced nanoparticles can be used as synergizing transporters for these phytochemicals. Ayurvedic herbs are used in nano-ayurvedic medicine to functionalize various nanoparticles, increasing their potency and specificity to a specific target. The active phytochemicals of these herbs can be coated onto nanoparticles made of different metals, like gold, according to studies, and they work better than the free herbal extract to stop cancer cells from growing. A recent human clinical trial based on Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homeopathy (AYUSH) demonstrated these formulations' anticancer potential. For hyperproliferative diseases, nano-ayurvedic medicine is emerging as a potential treatment option..

## Nanoparticles in cancer therapy

Ongoing years have seen a torrential slide of examination yield investigating the underlying and useful parts of various sorts of nanoparticles. These nanoparticles can be used in a variety of biomedical applications after being shaped and stabilized in a variety of ways. As of late, a few investigations have revealed the malignant growth restorative capability of metallic nanoparticles. The clinical potential of gold and silver nanoparticles is well-established among metal nanoparticles. Gold nanoparticles, in particular, have been the subject of extensive research regarding their potential applications in cancer diagnosis and treatment.

Notably, these aggregation-resistant nanoparticles exhibit significant anticancer properties and intriguing mechanisms of action even when stabilized with common substances like citrate

or tryptone Combining these nanoparticles with a drug that stops cells in the G2/M phase would help get rid of cancer cells with unpredictable cell cycle kinetics in this case. The ability of these nanoparticles to selectively Eliminate Triple-Negative Breast Cancer (TNBC) cells is another exciting discovery. Dissimilar to ordinary cells, TNBC cells harbor various duplicates of centrosomes. These additional copies of the centrosome, which are referred to as supernumerary centrosomes, assist cancer cells in reshaping their cytoskeleton, facilitating their migration and metastasis.

## Targeted delivery strategies

In addition, these nanoparticles can target growths both "latently" and "effectively." A tumor's defects, such as a leaky vasculature that allows the nanoparticles to seep into the tumor's tissues and an inadequate lymphatic drainage system that allows the particles to remain within the tumor, are utilized in passive targeting. Active targeting, in which tumor-specific peptides and antibodies are utilized, is actively being investigated due to the fact that only a small portion of the nanoparticles injected into the. For example, by forming remedial nanoparticles with a neutralizer that objectives Human Epidermal Development Factor Receptor 2 (HER2), HER2-overexpressing bosom growths can be focused on.

Also, cyclic Arginine-Glycine-Glutamate (cRGD) peptides can be joined to gold nanoparticles to target explicit  $\alpha/\beta$  integrin receptors that are overexpressed in a few growths. Ayurveda is a medical system that dates back thousands of years to India. Herbs make up the majority of ayurvedic medicines. As opposed to depending solely on individual compound atoms for the ideal remedial result, Ayurveda centers around the joined and pluripotent impacts of dynamic substances and their ideal extents in its treatment modalities. The treatment plans also vary because the system treats each person as an individual. For instance, phytochemicals can be used to enhance the tumor cell-specific cytotoxicity of gold nanoparticles. The formulation can be tethered to suitable molecules that target tumors to increase its target specificity.