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Nanocurcumin: A new approach to combat cancer

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pplication of curcumin as an anti-cancer agent is based solely on the epidemiological evidences suggesting a correlation Abetween dietary turmeric and low incidence of cancer. Considerable investigations have been carried out in order to increase curcumin's bioavailability, systemic delivery and thereby it's anticancer potential. It is evident that nanocurcumin has better bioavailability parameters and efficacy than free curcumin. Studies demonstrated that the nanoparticulate formulations could deliver curcumin into tissue macrophages, specifically bone marrow and splenic macrophages and suggested that the intravenous delivery system of curcumin using lipid-based nanoparticles may be available for antioxidant and anti-inflammatory therapies. In several studies, the nanocurcumin has demonstrated more rapid and efficient cellular uptake than curcumin. Nanocurcumin had better apoptotic activity, greater inhibition of TNF-induced NF-kappa-B activation and enhanced suppression of NF-kappa-B-regulated proteins involved in cell proliferation (cyclin D1), invasion (MMP-9), and angiogenesis (VEGF). The nanocurcumin was more bioavailable and had a longer half-life than curcumin. Cell viability studies revealed that the curcumin-loaded nanospheres were able to exert a more pronounced effect on the cancer cells as compared to free curcumin. These curcumin nanoformulations were characterized for particle size, zeta potential, drug encapsulation, drug compatibility and drug release. The last decade has witnessed a huge progress in nano based enhancement of anticancer potential of curcumin. The nano alterations to curcumin have been more focused on enhancing its bioavailability rather than its therapeutic activity. It was concluded that such nanoparticle-based formulation of curcumin (nanocurcumin) has high potential as an adjuvant therapy for clinical applications in cancer treatment.

Biography

Ravendra Pratap Singh Chauhan serves as a Project Assistant in Amity Institute for Herbal Research and Studies at Amity University, Noida, India. Mr. Chauhan has been utilizing the approach of Nanotechnology into herbal research. Mr. Chauhan and their team have been pursuing their interdisciplinary research interests to meet the challenges in nutraceuticals and disease prevention.

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