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Curcumin nanoparticle as a potential antiviral treatment

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Curcumin is a natural polyphenolic agent derived from the roots of the rhizome plant Curcuma longa from the family Zingiberaceae. Curcumin, the yellow pigment in turmeric, has long been used in traditional Indian herbal medicine to treat a variety of infections and inflammation-related illnesses. Curcumin is said to have antiviral properties against a wide range of viruses. However, due to the characteristics attained by curcumin like poor solubility, low bioavailability and fast degradation in water, it limits and hinders its potential in antiviral treatment applications. Therefore, to overcome this limitation, curcumin nanoparticles have been developed to enhance their activity and provide potential treatment against viral diseases. Curcumin nanoparticles inhibit viral entry and budding by modifying the composition of the virus's surface protein. Numerous experiments are being conducted on this nano molecule due to its positive pharmacological properties, including antiviral function. The procedure to produce curcumin nanoparticles includes isolation, extraction, and separation of curcumin from the Curcuma longa. The emulsion method is then used to synthesise curcumin nanoparticles, followed by treating the sample with ultrasonication to obtain the nanoparticles. After the curcumin nanoparticle is prepared, characterisation is accomplished by nuclear magnetic resonance (NMR) and ultraviolet spectra to observe the antiviral properties of the curcumin nanoparticles. However, to achieve the potential to treat viral diseases, different assays are performed in vitro. As certain viruses are immune to antibiotics, medications, and other treatments, researchers have combined natural therapeutics with nanobiotechnology to create curcumin nanoparticles, to improve the antiviral treatment. Apart from antiviral treatment, curcumin nanoparticles could also be used to treat a wide range of other diseases through further research.

Keywords: Nanoparticle, Curcuma longa, Bioavailability, Pharmacological properties, Viral diseases, Nanobiotechnology

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