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EDITORIAL NOTE A SCITECHNOL JOURNAL

Editorial Note on Nano Curcumin

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Editorial

Curcumin, a polyphenolic pigment found in turmeric, has tremendous medicinal potential, but it has yet to be developed as a medication due to its poor water solubility and metabolic instability. Curcumin can remain in keto-enol tautomeric forms depending on ambient pH, according to structural analyses. Curcumin, a polyphenolic pigment found in turmeric, has tremendous medicinal potential, but it has yet to be developed as a medication due to its poor water solubility and metabolic instability. Curcumin can remain in keto-enol tautomeric forms depending on ambient pH, according to structural analyses. The keto form is formed at an acidic pH, and the presence of the -diketone motif in the molecule activates the methylene group, allowing it to donate a hydrogen atom to reactive oxygen species, resulting in its anti-oxidative capabilities. Because of substantial delocalization of electrons from one aromatic ring to the other through the pi orbital of C=C bonds in the heptadione linkage, the enol form of curcumin, which is present at alkaline pH, forms a planar molecule. Curcumin is degraded to smaller molecules at alkaline pH, which have been proven to have therapeutic potential. The methylene group in the -diketone domain, as well as the methoxy and phenoxy groups on the aromatic rings of curcumin, have been identified as contact locations with enzymes and signalling molecules, and may be involved in inactivating them, according to molecular interaction studies. Turmeric, made from the rhizome of the Curcuma longa plant, has long been used in Indian traditional medicine for wound healing, pain relief, and antibacterial purposes. However, no one knew what the bioactive component of turmeric was until Vogel Jr. extracted the yellow pigment in its pure form in 1842. Milobedzka and Lampe elucidated its chemical structure and named it curcumin as a result of this. Following that, Srinivasan's fractionation in 1953 revealed that it was made up of three separate molecules: curcumin, demethoxycurcumin, and bisdemethoxycurcumin. A fourth molecule, cyclocurcumin, has recently been discovered utilising improved chromatographic techniques, compatible resins, and solvent systems.

Curcumin was commercially available once the process for isolating it from Curcuma longa extract was discovered, and many laboratories from all over the world began testing its potential as a therapeutic agent against various infections and cancer cells in culture and animal models. This resulted in a great amount of fascinating information. Because curcumin has the potential to lower inflammation, researchers are working to see if it may be turned into an adjunct medicine for use in chronic inflammatory disorders in humans, such as cancer, neurological diseases, and arthritis. To do so, however, it would be necessary to determine its pharmacokinetics and short- and long-term toxicity in animals. Most studies prefer the nanotization method because it allows nano curcumin to be produced and delivered orally, resulting in greater bioavailability, longer blood circulation, and lower toxicity. Nanotechnology-based drug delivery systems appear to have the potential to solve some of these issues. An examination of published articles and patent applications reveals how hard scientists are working to find ways to prevent or treat chronic inflammatory diseases such as cancer, cardiovascular disease, and neurological disorders. These activities are carried out all over the world, particularly in the United States, India, China, Europe, and South Korea. Only universities, research institutes, and a few small pharma businesses are known to be participating in nano curcumin research and patenting. There are currently no significant pharmaceutical companies active in the promotion of nano curcumin. On November 7, 2000, the first patent on nano-based curcumin was registered, and the first research publication on nano-based curcumin for therapeutic uses was published in the 2005.

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