

Curcumin is a specially gifted molecule provided by Mother–Nature to protect humans from chronic health problems. Overall it appears that even though there has been significant progress in the chemistry of curcumin, a great deal can still be expected from chemists to exploit this divine natural product as a therapeutic remedy for many chronic diseases. Recent research is now focused on developing conjugates of curcumin with metal and metal oxide nanoparticles and some of these formulations have promising potential in nanomedicine with additional effects of inducing targeted hyperthermia in cancer cells. The presence of α,β -unsaturated structure makes curcumin participate in nucleophilic addition reactions with protein thiols and selenols, that play important role in modulating cellular oxidative stress. The metabolic products of curcumin are different from the degradation products, where O-conjugation and reduction are the important processes initiated through the enzymatic reactions. Recently there is a surge of activity on preparation and characterization of curcumin–metal complexes due to the strong affinity of β -diketo moiety as an efficient metal chelator. In simple aqueous and aqueous–organic solutions, it is susceptible to fast degradation, which increases as the basicity of the solutions increases, and also on exposure to sunlight.