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A study of pharmacokinetics of curcumin and curcumin bio-conjugates by NMR and computational methods

Durg Vijay Singh*, Santosh Kumar Bharti, Raja Roy and Krishna Misra

*Indian Institute of Information Technology - Allahabad, India
Centre of Biomedical Magnetic Resonance, India

In order to investigate the affinity of curcumin and its conjugates with Human serum albumin (HSA), NMR based diffusion techniques and computational simulation have been carried out to assay the binding of curcumin and its synthetic bioconjugates i.e. curcumin 4,4'-di-O-piperoyl (CDP) and curcumin di-O-glycinoyl (CDG) with human serum albumin (HSA). These two conjugates of curcumin have been reported to be therapeutically more active than curcumin. The binding affinity of curcumin and curcumin bioconjugates has been compared with tryptophan, a model system. We report that curcumin has shown comparable binding affinity vis-a-vis tryptophan. Conclusion drawn from our study demonstrates that poor half life may not be due to less affinity of curcumin with HSA but it is due to high rate of its metabolic detoxification, which in case of conjugates may be delayed due to masking of phenolic functions.