# Biological Evaluation of Curcumin and Related Diarylheptanoids

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Nine derivatives of three natural diarylheptanoids, curcumin, demethoxycurcumin and bisdemethoxycurcumin, were prepared. Their antioxidant, free radical scavenging, nitric oxide (NO) inhibitory and cytotoxic activities were evaluated and compared with those of the respective natural compounds. Curcumin (**1**), demethoxycurcumin (**2**), demethyldemethoxycurcumin (**C3**), diacetyldemethoxycurcumin (**AC2**) and triacetyldemethylcurcumin (**AC5**) exhibited higher antioxidant activity than quercetin while products from demethylation of **1** and **2** exhibited higher free radical scavenging activity. Compounds **AC2** and **AC5** were found to be most active in inhibiting breast cancer cells (MCF-7) proliferation with $IC_{50}$ values of 6.7 and 3.6 $\mu$M, respectively. The activity of **AC2** is almost doubled and of **AC5** almost tripled as compared to curcumin. Their selectivity towards different cell lines is also more noticeable. Compounds **AC2** and **AC5** also showed increased activity against a human prostate cancer cell line (DU-145) and non-small lung cancer cell line (NCI-H460) with $IC_{50}$ values of 20.4, 16.3 and 18.3, 10.7 $\mu$M, respectively.

*Key words:* Curcumin Derivatives, Antioxidant, Nitric Oxide Inhibitory and Cytotoxic Activity