Supporting Information

Targeting human telomeric G- quadruplexes DNA with curcumin and its synthesized analogues under molecular crowding condition

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Table S1. Contribution of Coulombic interactions to binding free energies of curcumin and its derivatives when docked to G-quadruplex hybrid form structure and the double stranded dodecamer B-DNA

Ligands	G-quadruplex DNA (ΔG kJ/mol)	B-DNA (ΔG kJ/mol)
Curcumin	-71964.83	-3522.48
Pyrazole curcumin	122.84	251.26
N-(3-Fluorophenyl) pyrazole curcumin	-0.09	144.92
N-(3-Nitrophenyl) pyrazole curcumin	114.42	170.62
4-(4-Hydroxy-3-methoxy) benzylidene curcumin	11.69	126.29

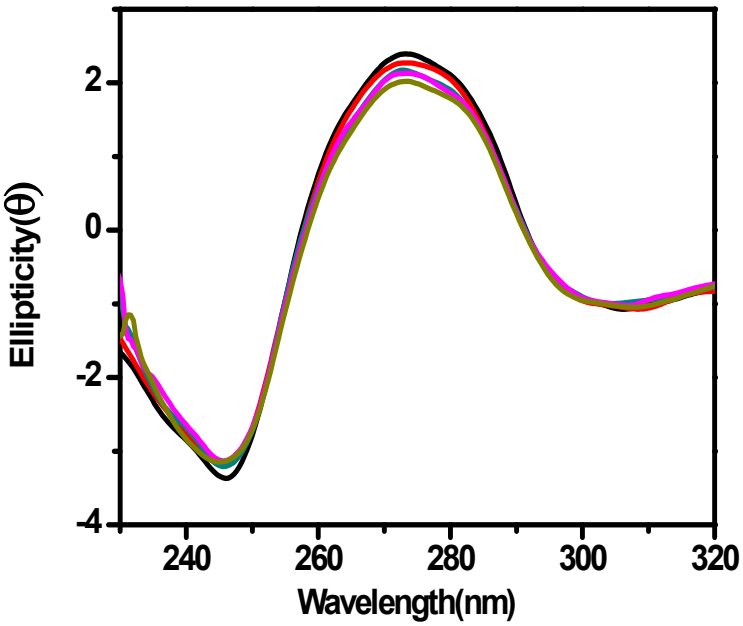

Figure S1: CD spectra of 5 μM ct-DNA with curcumin (0, 2, 4, 10, 15 and 20 μM) respectively in 10 mM Tris-HCl having 100 mM KCl and 10% PEG, pH 7.4

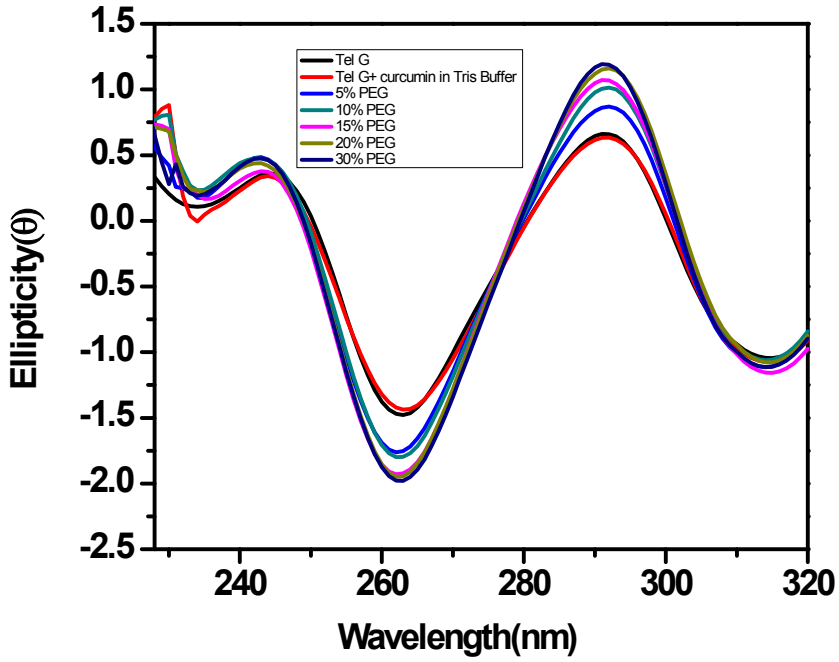

Figure S2: CD titration of 5μM $AG_3(T_2AG_3)_3$ with curcumin (20 μM) in increasing concentration of PEG 400.

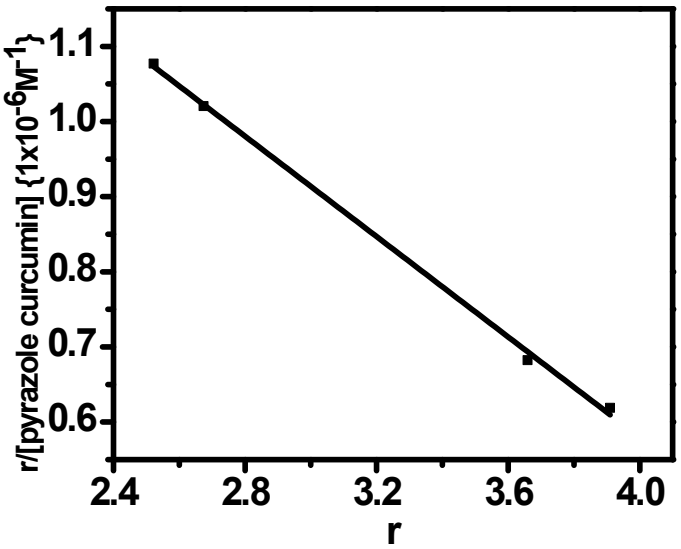

Figure S3: Binding curve of Pyrazole curcumin with $AG_3(T_2AG_3)_3$ for r = 2.525 to r = 3.9097

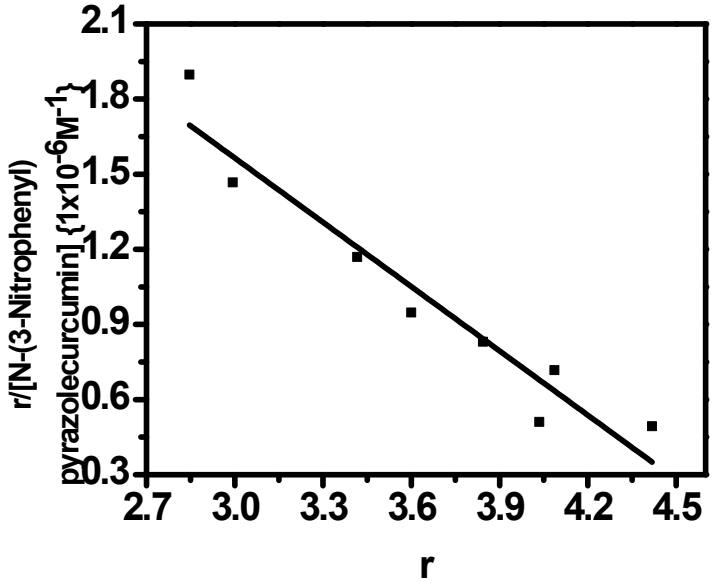

Figure S4: The binding curve of N-(3-Nitrophenyl) Pyrazole curcumin with $AG_3(T_2AG_3)_3$ for r = 2.85 to r = 4.425

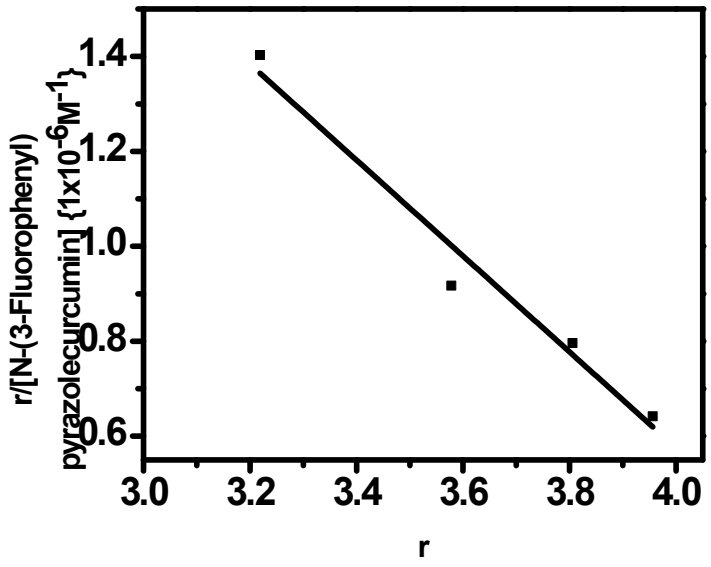

Figure S5: The binding curve of N-(3-Fluorophenyl) Pyrazole curcumin with $AG_3(T_2AG_3)_3$ for r = 3.22 to r = 3.95

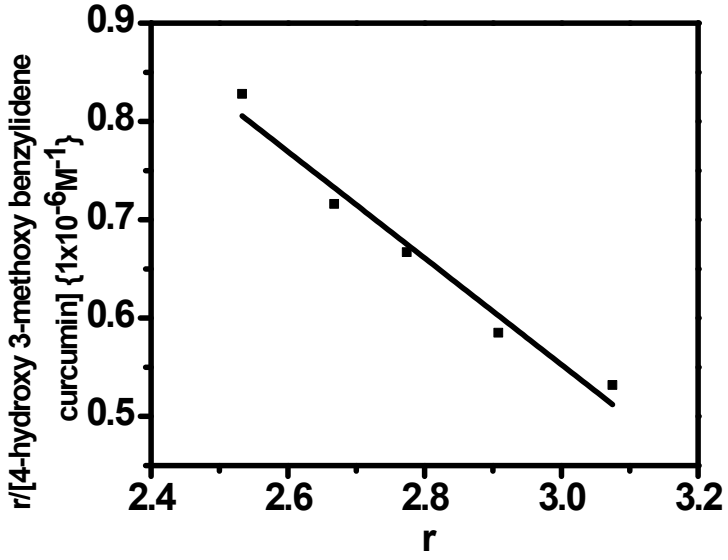

Figure S6: The binding curve of 4-hydroxy 3-methoxy benzylidene curcumin with $AG_3(T_2AG_3)_3$ for r = 2.53 to r = 3.07

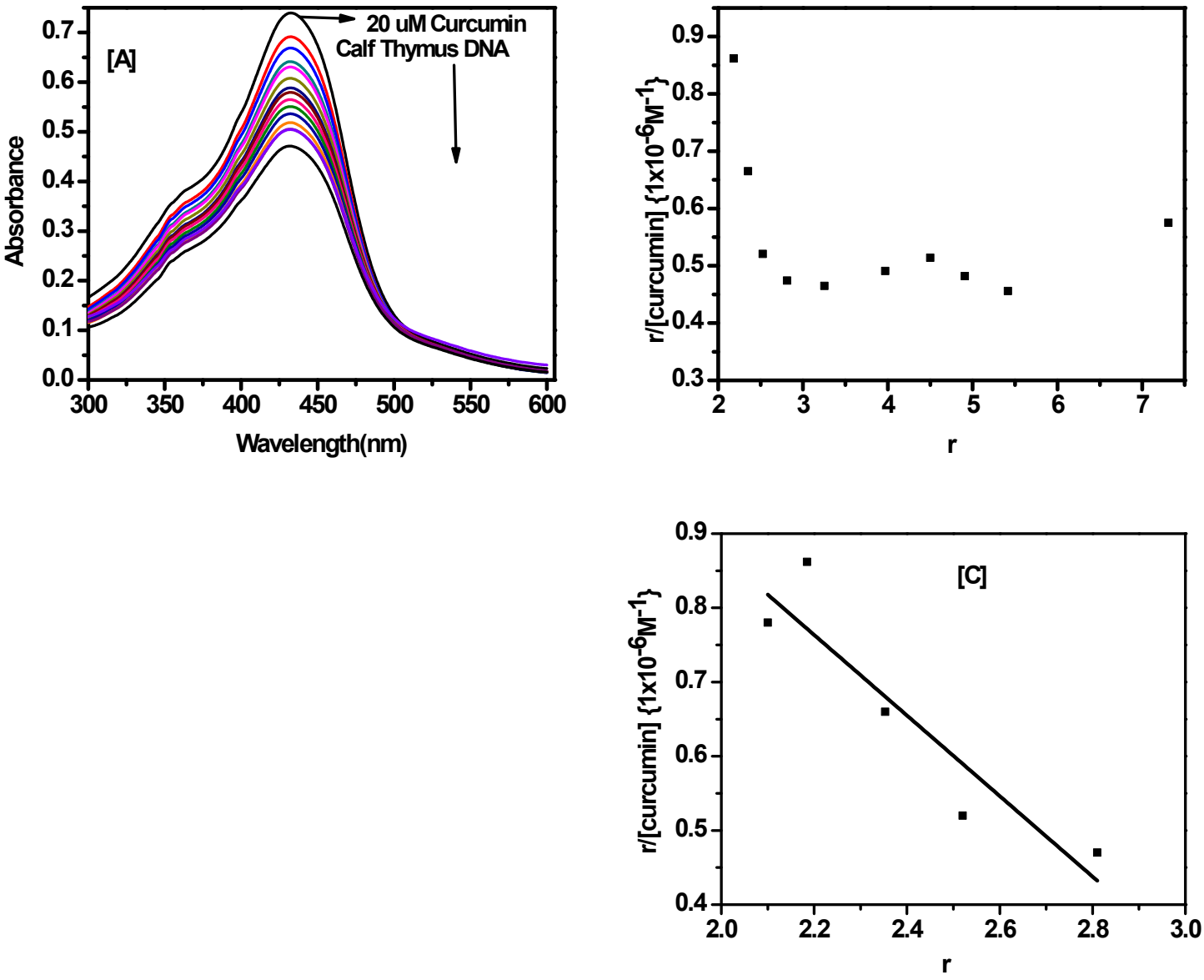

Figure S7: (a) Absorption spectra of 20 μM curcumin with ct-DNA (b) Scatchard plots for curcumin ct-DNA. r is the mole of bound curcumin per mole of ct-DNA (c) Binding constant curves for curcumin with ct-DNA for r = 2.8 to r = 2.1

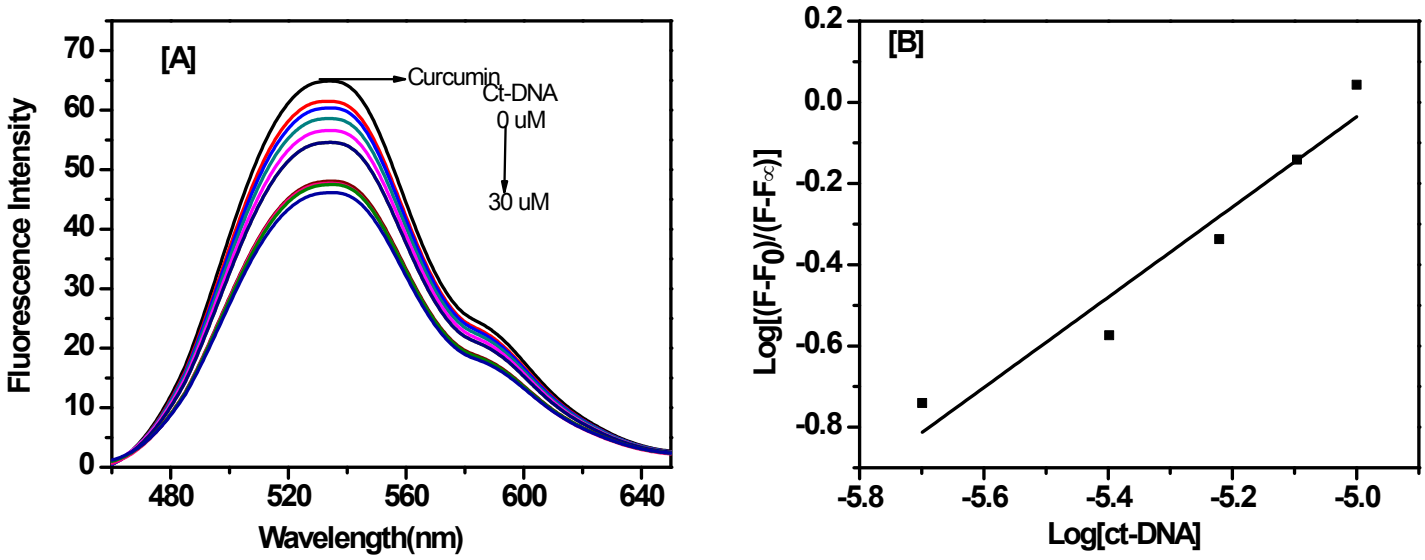

Figure S8: (a) Fluorescence emission spectra of curcumin (20 μM) in the absence and in the presence of increasing concentration of ct-DNA (ct-DNA: 0,2,4,6,8,10, 15, 20, 25 and 30 μM).(b) The double logarithmic plot to calculate K_b, [curcumin] = 20 μM and [ct-DNA] = 0 to 30 μM

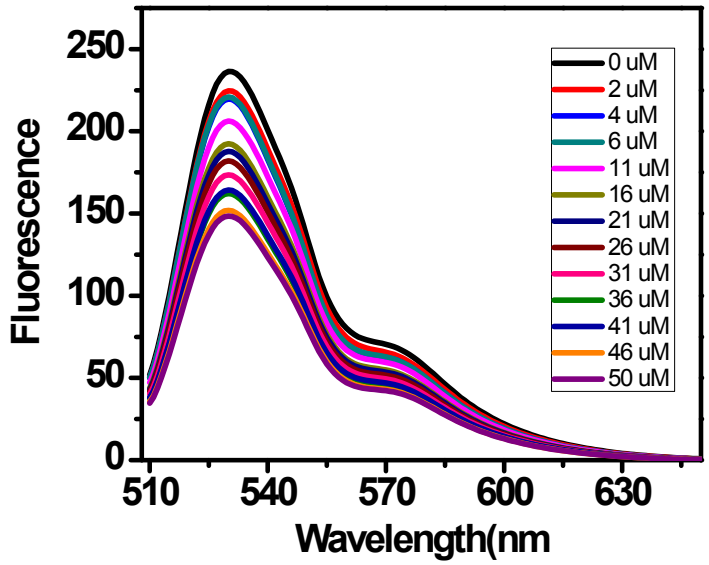

Figure S9: Fluorimetric Titration of TO with $AG_3(T_2AG_3)_3$ and curcumin in 10mM sodium cacodylate buffer (pH 7.2) with 100 mM KCl

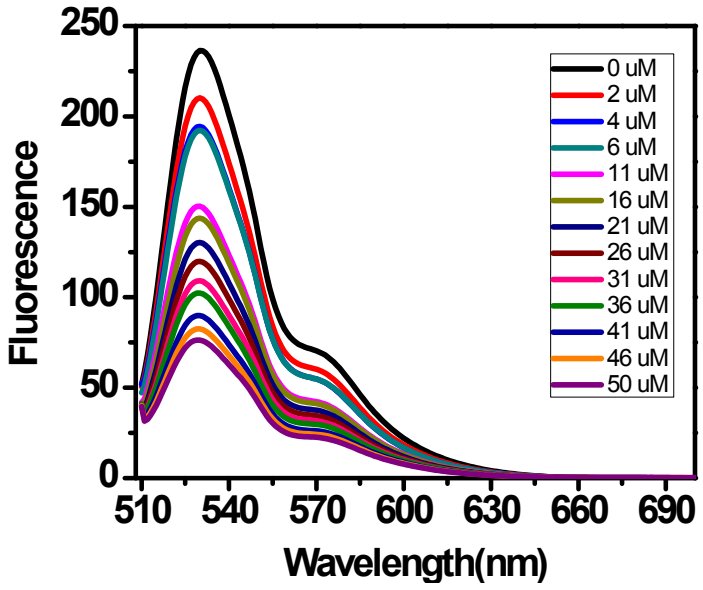

Figure S10: Fluorimetric Titration of TO with $AG_3(T_2AG_3)_3$ and 4-(4-hydroxy 3-methoxy) benzyldiene curcumin in 10mM sodium cacodylate buffer (pH 7.2) with 100 mM KCl

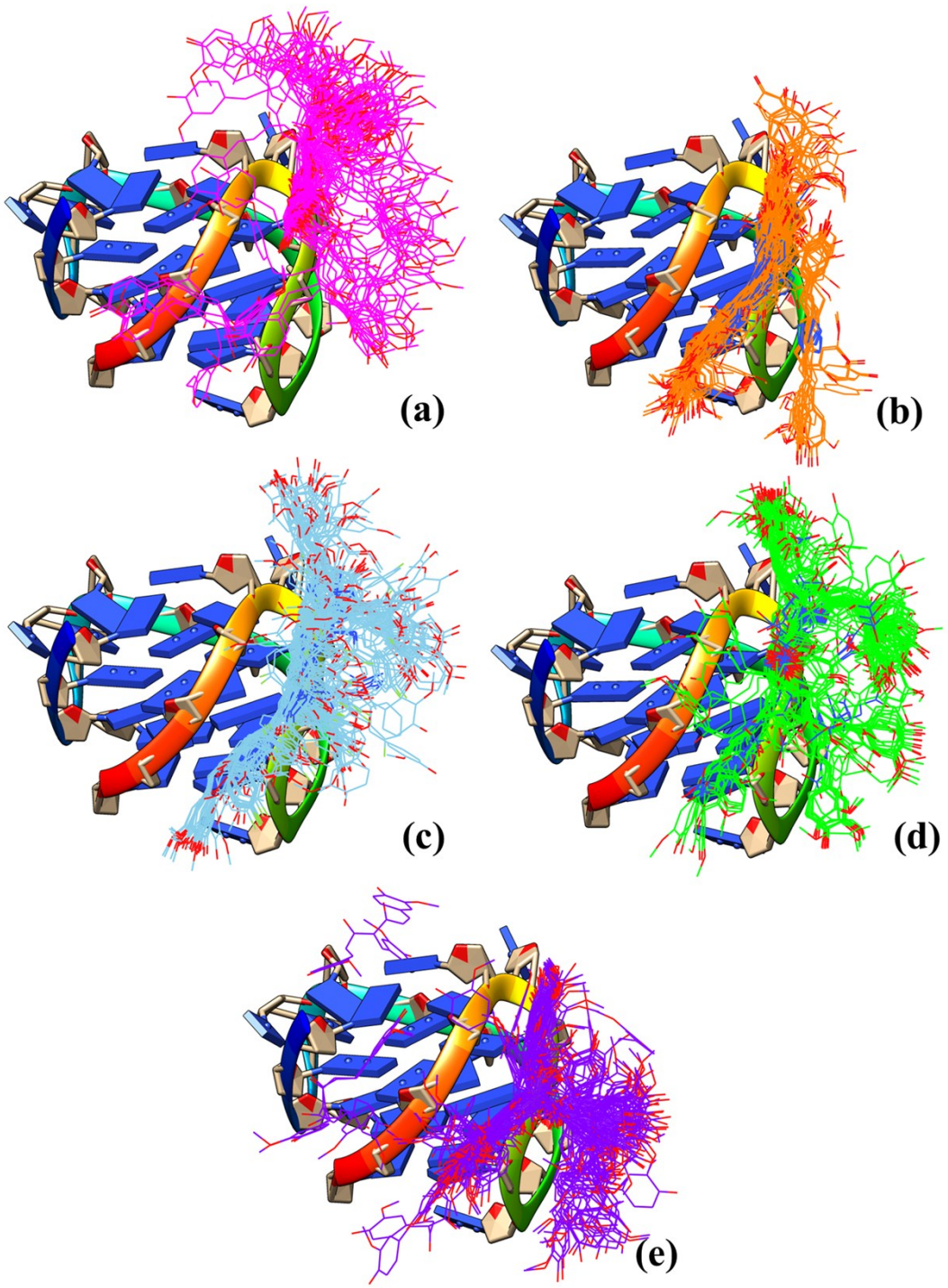

Figure S11. The docked conformers of curcumin and its four derivatives in the narrow groove of G-quadruplex hybrid form DNA (PDB ID: 2HY9). Shown are the 100 docked conformations of (a) Curcumin, (b) Pyrazole curcumin, (c) N-(3-Fluorophenyl) pyrazole curcumin, (d) N-(3-Nitrophenyl) pyrazole curcumin and (e) 4-(4-Hydroxy-3-methoxy) benzylidene curcumin

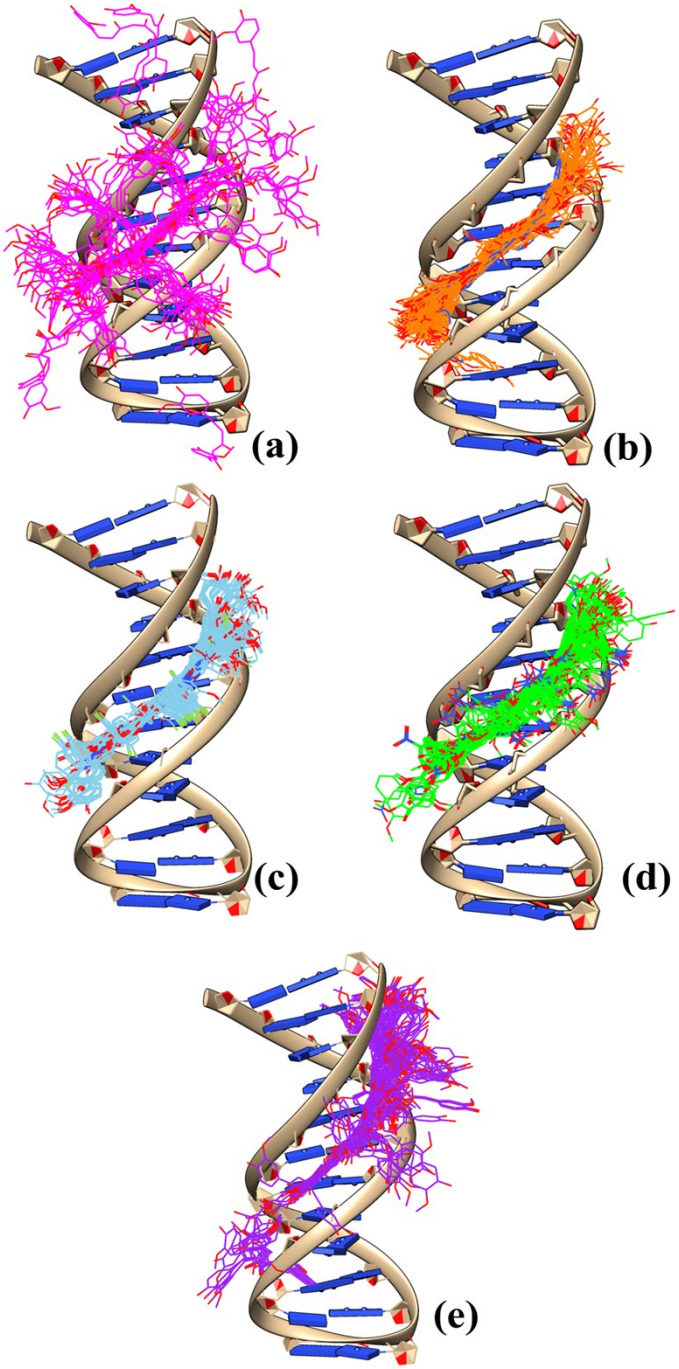

Figure S12. The docked conformers of curcumin and its four derivatives in the minor groove of B-DNA (PDB ID: 1BNA). Shown are the 100 docked conformations of (a) Curcumin, (b) Pyrazole curcumin, (c) N-(3-Fluorophenyl) pyrazole curcumin, (d) N-(3-Nitrophenyl) pyrazole curcumin and (e) 4-(4-Hydroxy-3-methoxy) benzylidene curcumin.

Mass Spectrum and ^{1}H NMR Spectrum compounds (2-5):

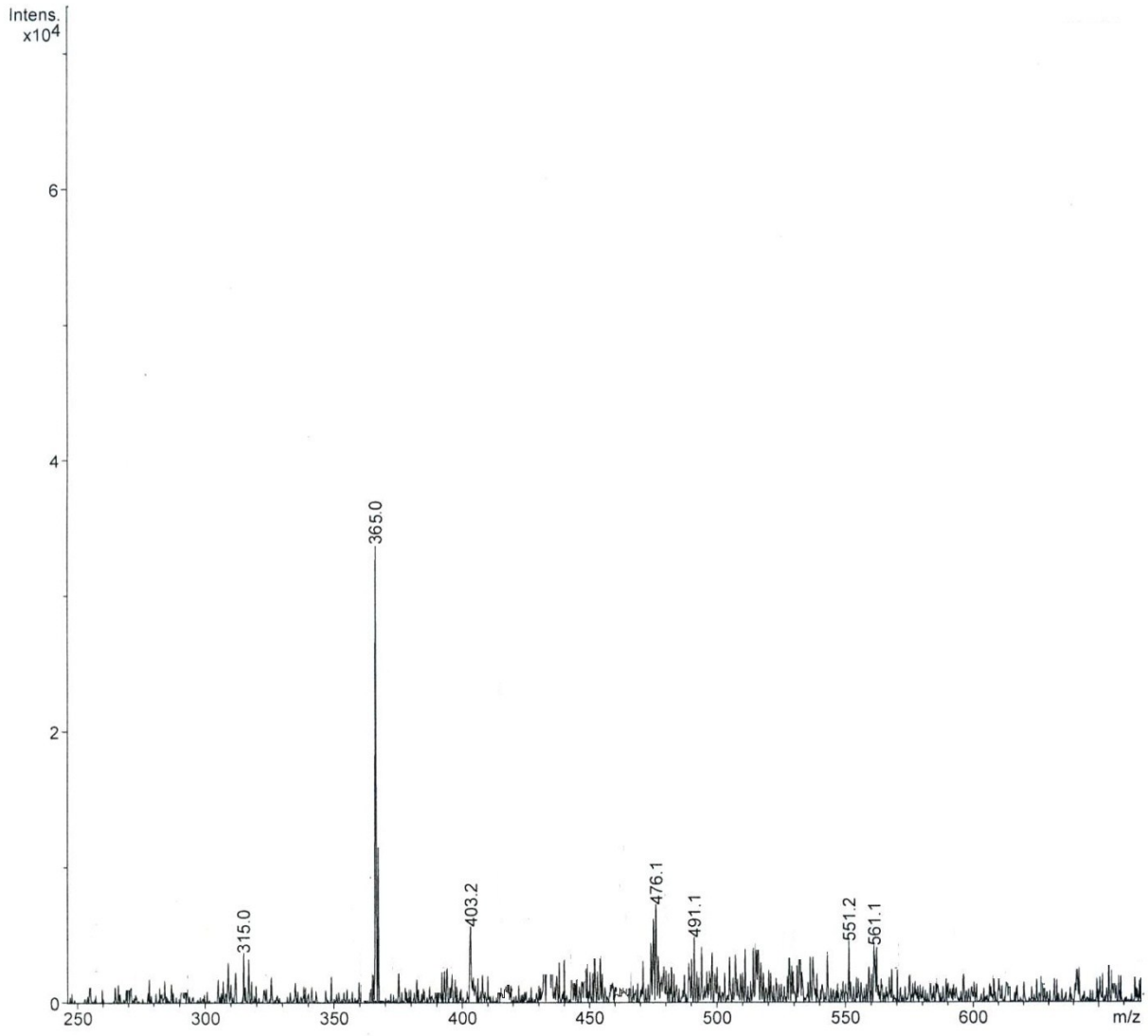

Figure S13. Mass Spectrum of Curcumin pyrazole (**2**)

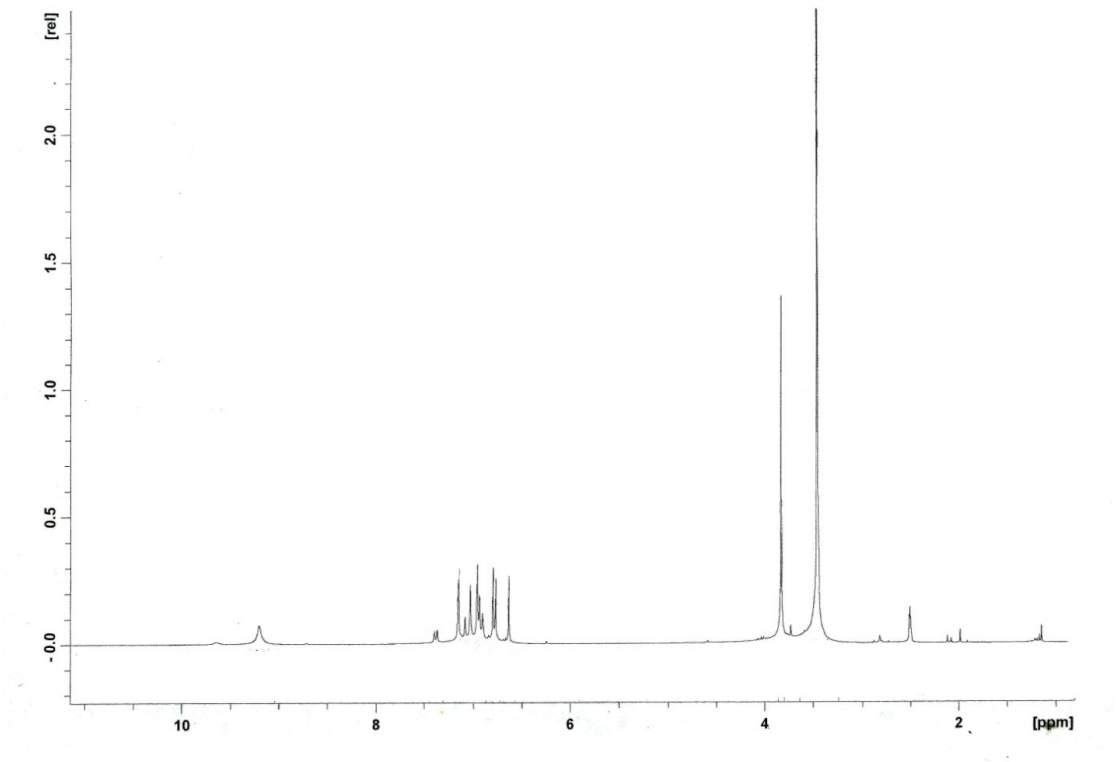

Figure S14. ^{1}H NMR Spectrum of Curcumin pyrazole (**2**) in DMSO-d_6

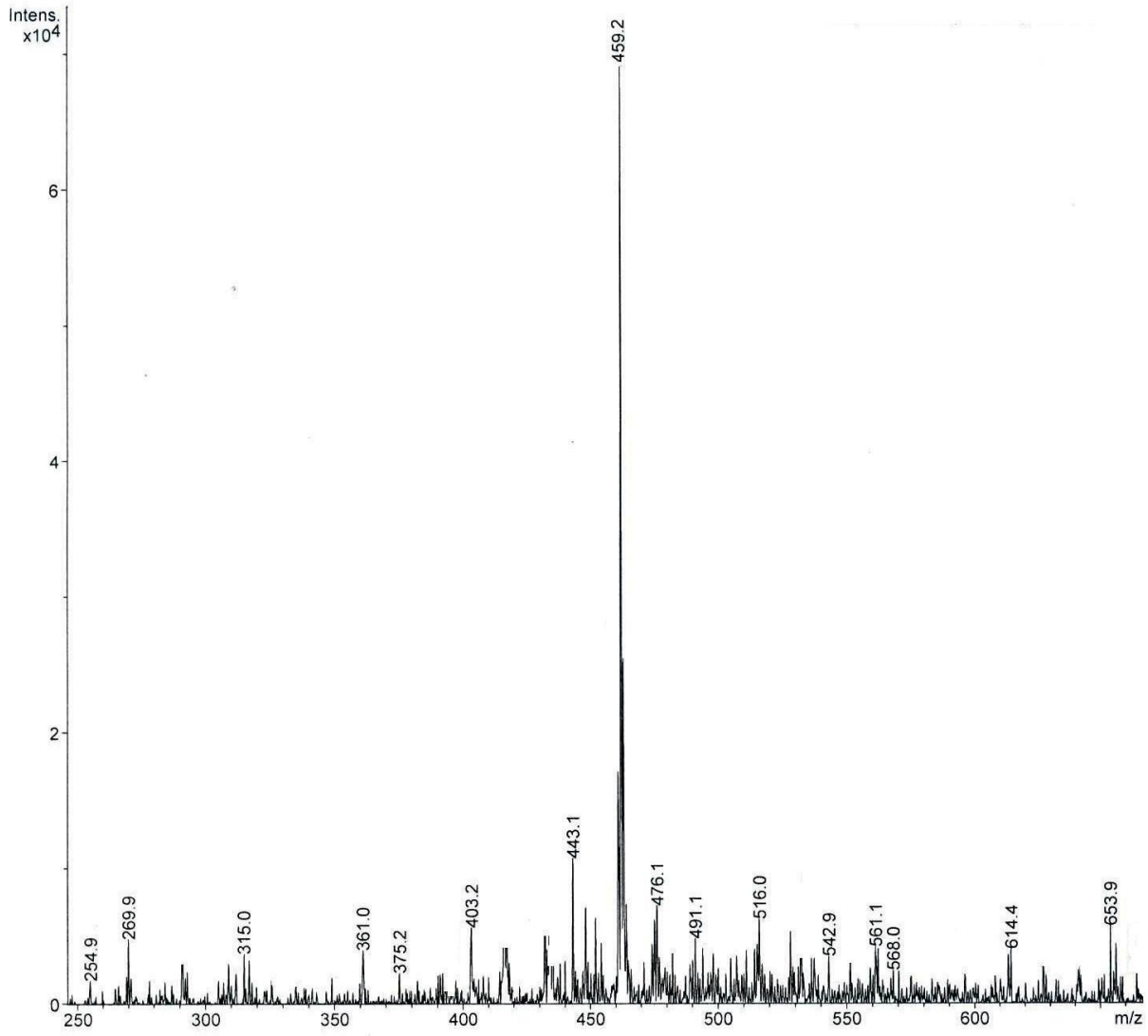

Figure S15. Mass Spectrum of *N*-(3-Flurophenylpyrazole) Curcumin (**3**)

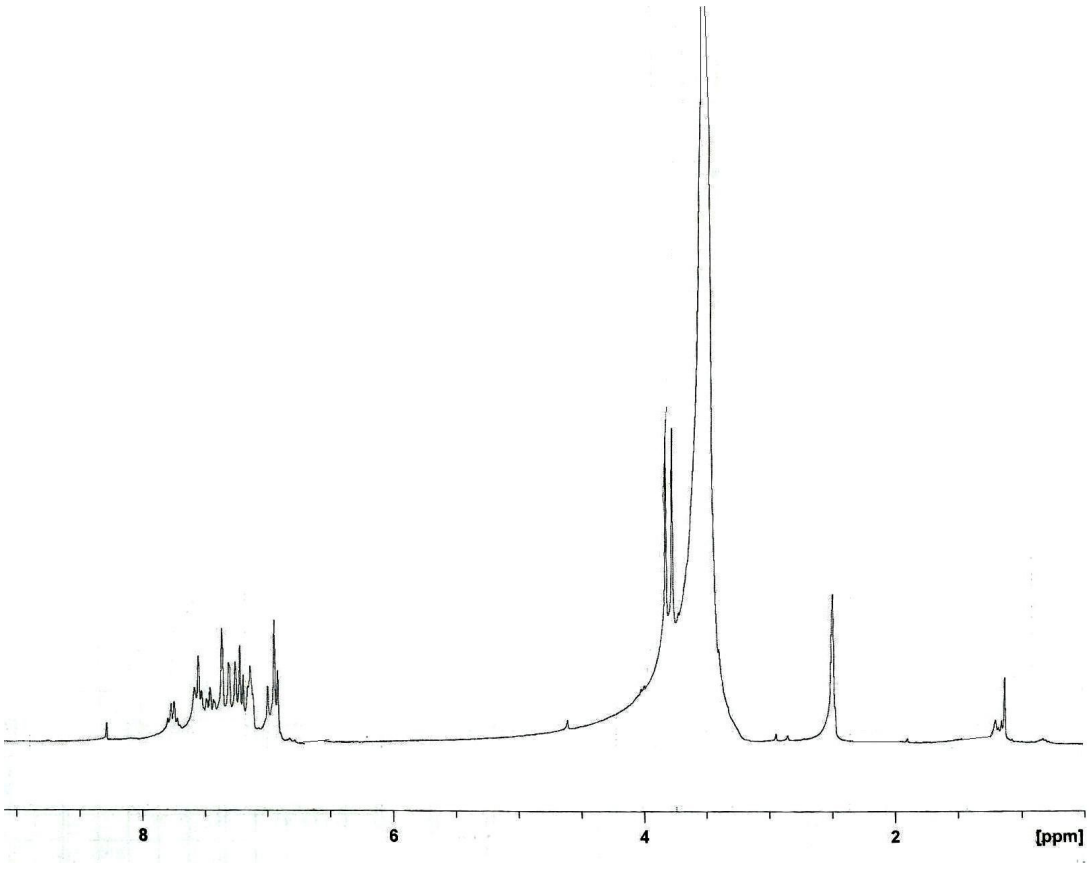

Figure S16. ^{1}H NMR Spectrum of *N*-(3-Flurophenylpyrazole) Curcumin (**3**) in DMSO-d_6

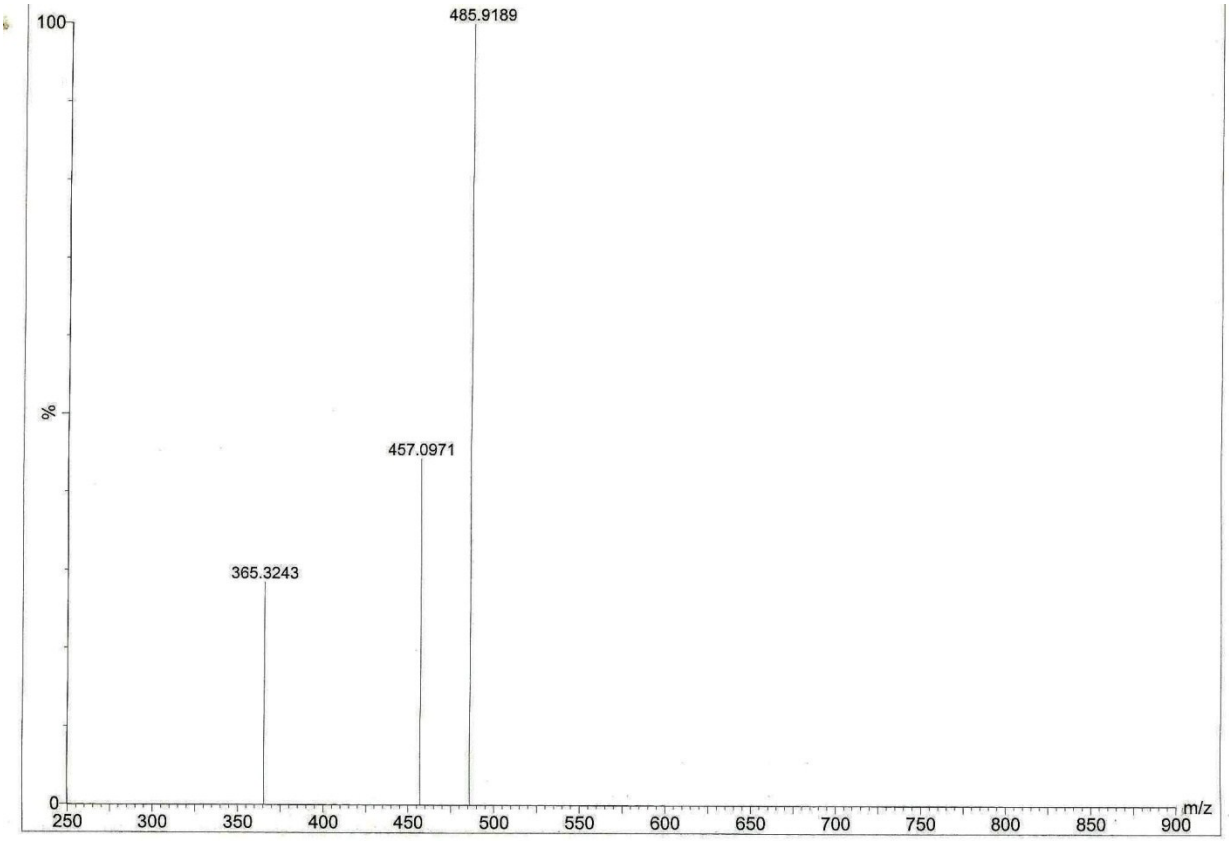

Figure S17. Mass Spectrum of *N*-(3-Nitrophenylpyrazole) Curcumin (**4**)

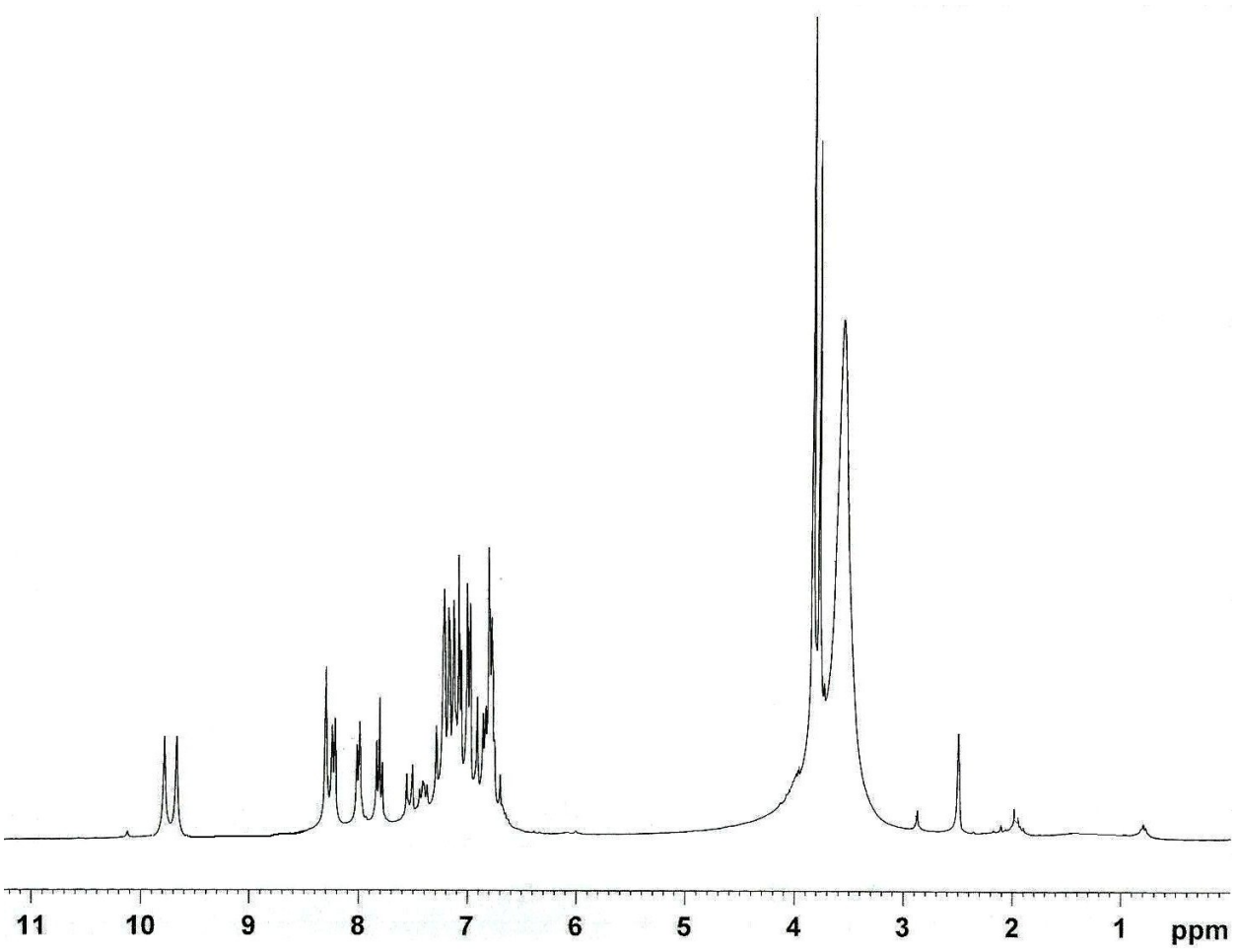

Figure S18. ^{1}H NMR Spectrum of *N*-(3-Nitrophenylpyrazole) Curcumin (**4**) in DMSO-d_6

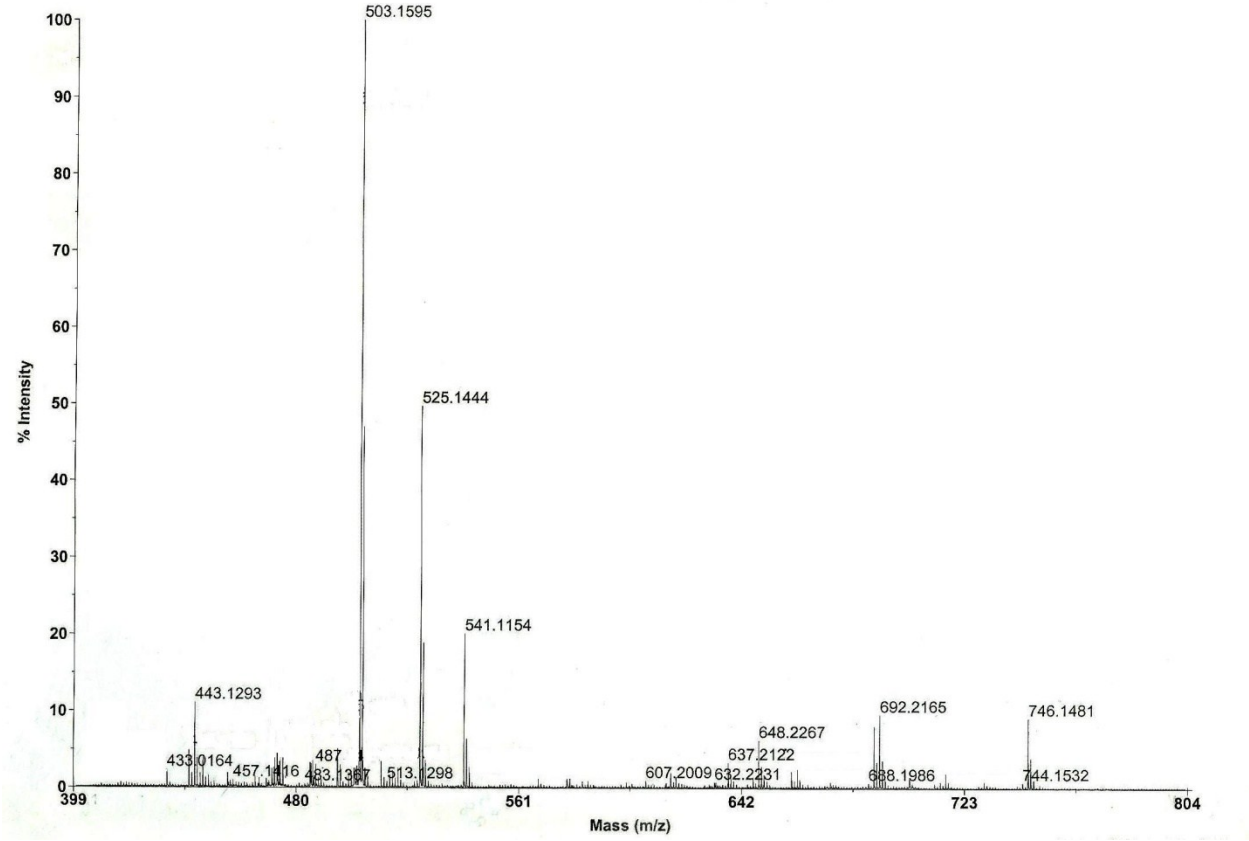

Figure S19. Mass Spectrum of 4-(4-Hydroxy-3-methoxybenzylidene) curcumin (**5**)

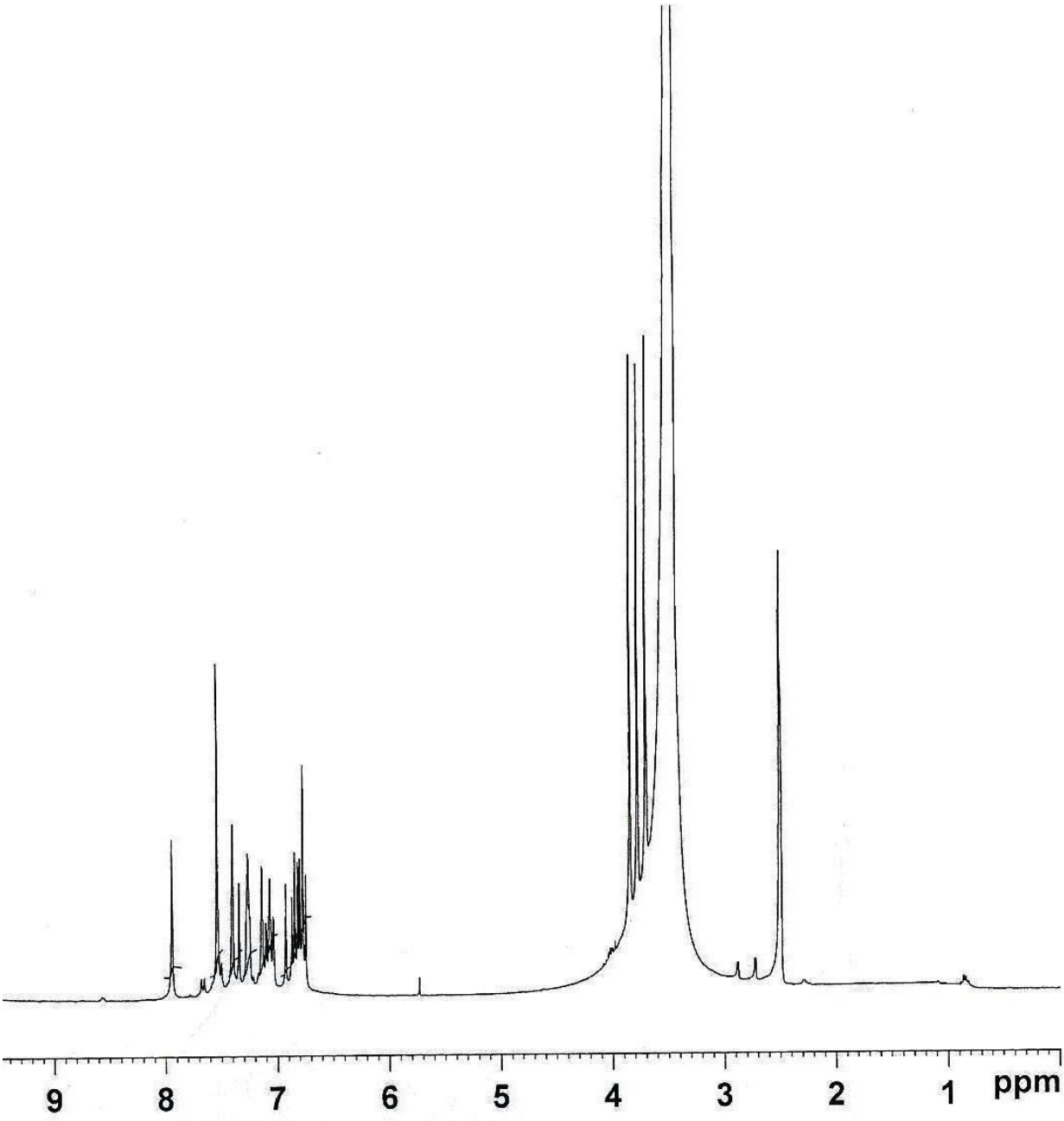

Figure S20. ^{1}H NMR Spectrum of 4-(4-Hydroxy-3-methoxybenzylidene) curcumin (**5**) in DMSO-d_6