IMPACT: International Journal of Research in Applied, Natural and Social Sciences (IMPACT: IJRANSS)
ISSN(E): 2321-8851; ISSN(P): 2347-4580
Vol. 3, Issue 10, Oct 2015, 81-88

ANALYSIS OF INTERACTION BETWEEN DIPHENHYDRAMINE AND HUMAN SERUM ALBUMIN

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ABSTRACT

The interaction between an antihistamine drug diphenhydramine (DPH; 2-(diphenylmethoxy)-*N*,*N*-dimethylethylamine) and human serum albumin (HSA) was investigated by means of equilibrium dialysis and NMR relaxation analysis. The binding constant of DPH to HSA determined from equilibrium dialysis was independent of ionic strength and decreased with the addition of fatty acid, suggesting that hydrophobic interaction predominates for the binding of DPH to HSA. It was difficult to determine the binding position from the chemical shifts in ^{1}H-NMR spectra of DPH, because they were almost independent of the concentration of DPH and HSA added. On the other hand, the relaxation analyses gave information on the interaction. The spin-lattice relaxation time (T_1) and spin-spin relaxation time (T_2) of respective protons of DPH were independent of the concentration of itself, but depended on the concentration of HSA added. The ratio of spin-spin relaxation rates ($1/T_2$) of DPH bound to HSA and free DPH indicated that the binding position of DPH to HSA involved hydrophobic aromatic moiety of DPH.

KEYWORDS: Hydrophobic Interaction, Diphenhydramine, Human Serum Albumin, Spin-spin Relaxation Rate