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EXTENT OF PROTEIN BINDING OF CIPROFLOXACIN BY EQUILIBRIUM DIALYSIS METHOD USING EGG MEMBRANE

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The pharmacokinetic and pharmacodynamic properties of drugs are largely a function of the reversible binding of drugs to plasma or serum protein. Generally, only the unbound drug is available for diffusion or transport across cell membranes, and for interaction with pharmacological target (e.g. receptor, ion channel, transporter, and enzyme). As a result, the extent of plasma protein binding of a drug influences the drugs action as well as its distribution and elimination. Ciprofloxacin is a second generation fluoroquinone antibacterial. In present investigation, four different concentration of protein (egg albumin) used for determine extended protein binding of drug (ciprofloxacin). From the diffusion study, it was concluded that percentage of drug release reduced at 1:4 ratio (drug: protein).

INTRODUCTION

A drug's efficiency may be affected by the degree to which it binds to the proteins within blood plasma. The less bound a drug is, the more efficiently it can traverse cell membranes or diffuse. Common blood proteins that drugs bind to are human serum albumin, lipoprotein, glycoprotein, α, β, and γ globulins.

A drug in blood exists in two forms: bound and unbound. Depending on a specific drug's affinity for plasma protein, a proportion of the drug may become bound to plasma proteins, with the remainder being unbound. If the protein binding is reversible, then a chemical equilibrium will exist between the bound and unbound states, such that:

Protein + drug ⇆ Protein-drug complex

Notably, it is the unbound fraction which exhibits pharmacologic effects. It is also the fraction that may be metabolized and/or excreted. Protein binding can influence the drug's biological half-life in the body. The bound portion may act as a reservoir or depot from which the drug is slowly released as the unbound form. Since the unbound form is being metabolized and/or excreted from the body, the bound fraction will be released in order to maintain equilibrium.

Since albumin is basic, acidic and neutral drugs will primarily bind to albumin. If

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