

The Role of ADME in Eliciting the Drug Activity

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ADME means absorption, distribution, metabolism and excretion. These four factors play a major role in the activity of the drug. Each of it has its own significance in the pharmacological action of the drug. Absorption is the process in which the uptake of drug in to systemic circulation takes place. To get absorbed into the blood stream, the drug has to pass through the lipophilic membrane of the stomach or intestine, thus the drug to be lipophilic in nature to get through it. Small substances can pass through the pores of the membrane or else if some other mechanisms are used to allow the drug into the membrane.

Once the drug get absorbed into the blood stream it needs to be distributed, thus distribution is the process in which the drug moves from the site of absorption to the site of action. Most of the drugs are distributed by blood. As most part of blood consists of water which is polar in nature, hence the drugs which are more hydrophilic in nature get easily soluble in blood and thus are distributed. Distribution of drugs also depends on the perfusion rates of the specific organs. After reaching the target site drug starts eliciting its action.

Metabolism is the process sin which the drug gets converted into its metabolites, here the toxicity of the drugs is reduced, and in some cases the drugs are made more hydrophilic to eliminate it easily. Most of the metabolism takes place in the liver by the cytochrome P450 enzymes. Initially, before the absorption also the drugs need to pass through the first pass metabolism where large part of the drug gets metabolized. The remaining portion of the drug shows the pharmacological activity and later it is also metabilised.

Excretion is the process in which the metabolized drug is removed out of the body to avoid unwanted toxicity. There are many kinds of excretion, Urinary excretion, and pulmonary excretion, bilary excretion, through skin and through faeces. If the molecule size more than 500 daltons then it is excreted through bilary excretion. The drugs having molecular size less than 500 daltons are excreted through urinary excretion. The drugs given in the gaseous form like inhalational sprays are removed by the pulmonary way. Very little amounts of the metabolites are excreted in the form of sweat.

For a drug to show good pharmacological activity it needs to have the characteristics which are suitable for all the functions, if the physico-chemical properties of it are good so that it suits the requirements of the processes then it will show better half -life and bioavailability. This in-turn affects the activity and efficacy of the drug. There are many factors like particle size, partition coefficient, polymorphism, crystal and salt formation ability, solubility, complexation, surface activity, redox potential, isomerism, dissociation constant, ionization of drug which affect the efficiency of the drug. All these factors are taken into consideration while a drug molecule needs to be prepared and many tests are performed to evaluate both its physical and chemical strengths and pharmacological activities of a drug.

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