Bioavailability

Definition

Bioavailability (F) is a pharmacokinetic parameter representing the fraction of a drug dose that reaches the systemic circulation unaltered.

Characteristics

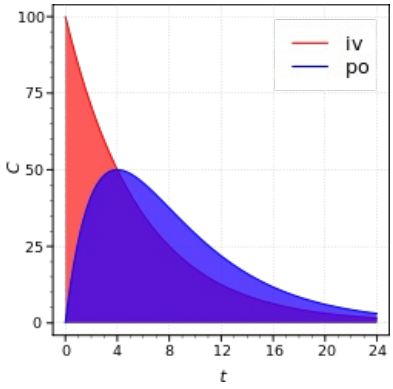
- The greater the F, the greater the amount of drug that reaches the systemic circulation, and thus the greater the drug concentration in plasma and vice versa
- The route with the highest F (F=1) is via intravenous (I.V.) administration.
- The second highest F is achieved through inhalation.
- The parenteral routes of drug administration have low F because all the drug absorbed by the GIT, passes through the hepatic circulation undergoing first pass metabolism, prior entering to the systemic circulation.

Types

Absolute bioavailability

It is the comparison of the per os F to the intravenous F

$$F_{abs} = \frac{AUC_{P.O.} \times D_{I.V.}}{AUC_{I.V.} \times D_{P.O.}} \times 100$$



where

$AUC_{P.O.}$: area under the curve for the oral route
$AUC_{I.V.}$: area under the curve for the intravenous route
$D_{P.O.}$: dose administered from oral route
$D_{I.V.}$: dose administers from intravenous route

Relative bioavailability

It is the comparison of the per os F to another administration route, other than intravenous.