

Effect of Food on the Behavior of Orally Administered Drugs*

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It has been shown that food can have a multiple fold increase in the bioavailability of poorly water soluble drugs. However, little information is known as to the causes of such an effect. The goal of this work is to exploit the food and drug interactions in order to help predict quantitatively the effect of food on drug absorption. In an attempt to represent the class of poorly water soluble drugs a moderately hydrophobic compound with $\log P = 2.45$ was chosen as the model drug and a simulated milk solution was chosen as the model food. Through measurements of drug dissolution we have observed an 8-fold increase in drug dissolution capacity in fed vs. fasted conditions throughout digestion. Moreover, through kinetics of drug partitioning across the different phases present during digestion we have observed delayed partitioning of the drug compound into the oil phase. As partitioning reaches a steady state 33% of the dissolved drug is found in the oil phase leaving 67% in the aqueous environment containing micelles secreted from the bile. Ultimately, these drug behaviors will be coupled with a model of absorption to enable prediction of the impact of food on overall oral drug absorption.

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