

transporters in the small intestine. It is also a good model to realistically mimic the gut physiological conditions (Barthe *et al.* 1999; Chowhan and Amaro 1977; Lacombe *et al.* 2004; Lafforgue *et al.* 2008).

1.1.1.1 Bioavailability

Bioavailability (BA) is critically determined by the absorption. It is defined as the rate (T_{\max} and C_{\max}) and extent (AUC) of an active substance that is absorbed from its dosage form (pharmaceutical form) to reach the blood circulation at its site of action. C_{\max} represents maximum plasma concentration that is observed at that time T_{\max} following drug administration. BA is controlled by drug solubility, drug dissolution rate in the intestinal fluid, drug permeability across the intestinal membrane, pre-systemic metabolism and the efficiency of drug transporting system (Rescigno 2010; Toutain and Bousquet-mélou 2004; Zakeri-Milani *et al.* 2007).

1.1.1.2 Factors affecting drug BA

There are several factors affecting drug BA such as drug solubility, permeability, the rate of *in vivo* dissolution as well as patient attributes such as membrane transporters, GI and liver (presystemic) metabolism, the integrity of the GIT, physiological status, and extrinsic variables such as the effect of food or concomitant medication. Moreover, the potential impact of patient physiological status such as age, gender, and lifestyle also play a crucial role in drug BA (Dressman and Reppas 2010; Martinez and Amidon 2002).