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Solubilization and Interaction Studies of Bile Salts with Surfactants and Drugs: a Review

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Abstract In this review, bile salt, bile salt–surfactant, and bile salt–drug interactions and their solubilization studies are mainly focused. Usefulness of bile salts in digestion, absorption, and excretion of various compounds and their rare properties in ordering the shape and size of the micelles owing to the presence of hydrophobic and hydrophilic faces are taken into consideration while compiling this review. Bile salts as potential bio-surfactants to solubilize drugs of interest are also highlighted. This review will give an insight into the selection of drugs in different applications as their properties get modified by interaction with bile salts, thus influencing their solution behavior which, in turn, modifies the phase-forming behavior, microemulsion, and clouding phenomenon, besides solubilization. Finally, their future perspectives are taken into consideration to assess their possible uses as bio-surfactants without side effects to human beings.

Keywords Bile salts · Surfactants · Drugs · Thermodynamics · Physico-chemical properties · Interactions

Introduction

Greenish yellow secretion, bile or gall, is secreted by the liver and stored in the gallbladder where it is concentrated or passed to duodenum part of small intestine. Its main purpose is to emulsify fats and help their absorption in the small intestine. Its main constituents are bile acids and bile salts, cholesterol, phospholipids, water, and pigments. One of the constituents of bile that is bile salts are formed of four different bile acids, namely, cholic, deoxycholic, chenodeoxycholic, and lithocholic. These acids in turn have the capacity to interact and combine with glycine or taurine forming complex acids and salts [1] (Fig. 1).

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