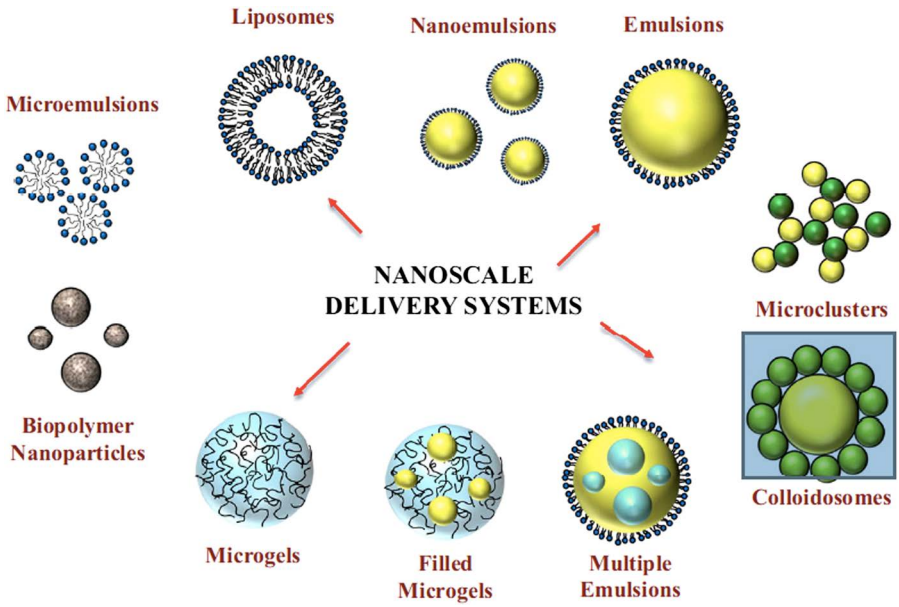

Figure 6.1 Some examples of nanoscale delivery system that can be used to deliver lipophilic bioactive compounds. Reprinted with permission from ref. 60. © 2015 Institute of Food Technologists®.

their unique physicochemical properties, high nutritional value, acceptability as natural food components, easy degradability by digestive enzymes and easy availability are some of the advantages of food protein matrices.[63] With the advent of more ecofriendly and sustainable ways to reuse industrial waste, especially in food and related industries, novel strategies are being developed to reuse them for alternative uses. In recent years, agricultural by-products have been recognized as a source of functional ingredients, including active compounds and dietary fibers. This has been achieved due to the development of technologies that help in the recovery of nutraceuticals from agro-wastes, and identification of novel approaches to reuse the recovered nutraceuticals in alternative food and related industries.[64] Of all the emerging technologies that have helped in realizing such development, nanotechnology leads the way with its versatility. Some examples of nanocarriers designed for delivering bioactive compounds are discussed below.

6.3.1 Nanoemulsions

Nanoemulsions are thermodynamically stable nanosized emulsions formed by mixing two immiscible liquids in the presence of an emulsifying agent to form a single phase. Delivery systems based on nanoemulsions can protect bioactive compounds from degradation and can be used for controlled release of the bioactive compounds with higher bioavailability. They can also