

1. This review was prepared in line with the preferred reporting items for systematic reviews and meta-analyses guidelines and the proposed guidelines for biomedical narrative review. The encapsulated sensitive agents (pure substances or a mixture of more agents) are known as coated materials, core materials, payloads, internal phases, etc., while the coating materials can be called shells, wall materials, capsules, carriers, membranes, films, the outer shell or packing materials. The choice of preparation method for an agent's encapsulation depends mostly on its properties, such as state of aggregation, sensitivity, size of molecules, etc., as well as the method of administration. Here, we review recently published new encapsulation approaches with high potential for use in the field of advanced therapies in medicine and targeted functional foods.

Introduction Considering the increasing age of the population and other factors such as lifestyle (workload, stress, environmental pollution, etc.), there is a global effort to ensure a certain standard of living, with an emphasis on the increasing level of medical care as well as on a healthy and nutritionally balanced diet. Moreover, many consumers are concerned with the nutritional aspects of food and interested in novel functional food products containing plant extracts, vitamins, probiotics and prebiotics, etc. Generally, the creation of encapsulated cells is a form of cell surface modification (e.g., an entrapment within a biopolymer structure) and has drawn a large amount of attention in various research areas, such as cell therapy, cell biosensors, biocatalysts, etc.. For adults, guidelines from the US Centers for Disease Control and Prevention and the WHO (World Health Organization) define a normal body mass index (BMI) range as 18.5 to 24.9, whereas a BMI ≥ 25 is considered to be overweight and a BMI ≥ 30 is classified as obese.