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Encapsulation of API: A promising platform for improving dispersity and bioavailability

Andrew Ebenazer
Ecoysus Life Science, India

The majority of the active pharmaceutical ingredients (API) are poorly soluble in water, thus require the formulation process for improving bioavailability. Conventionally, the addition of excipients was in common practice, however, higher bioavailability could be affected due to lack of dose proportionality. As to overcome this, encapsulation techniques have provided answers to entrap the API inside the hydrodispersive capsule as a safe carrier. The capsule chosen should serve the purpose of biocompatibility, dispersion stability, and targeted bioavailability. i) Emulsions: Encapsulate is a micelle system of surfactants. A simple emulsification technique along with essential oils, an easier and effectual formulation. Emulsification is carried out by a high energy process aided by the mechanical devices or low energy process aided by the internal physical property of the system. The emulsion system poses the advantage of blending multiple components into a single system for combinational drug delivery. (ii) Polymeric encapsulation: The utilization of polymers for encapsulation has gained upper hand over the emulsion system as most of them are hard colloidal particles, unlike emulsions. Mostly preferred ones are natural polymers such as gelatin, chitosan, agarose, alginate for entrapment of API. These polymeric capsules can be additionally coated with other polymers or adjuvants or other functional groups for the benefit of sustained and controlled release applications. (iii) Lipid encapsulation: The encapsulate is typically a lipid such as triglycerides, fatty acids, steroids. The formulation is typically carried out by hot or cold homogenization or spray drying. The lipid encapsulation provides good stability for lipophilic drugs with an added advantage in topical applications. Overall encapsulation of the API provides the possibility of formulating customized delivery vehicles for the targeted applications. Also, all these formulations can be converted into nanometric form by altering the surfactant concentration or system components or by altering the energy intensity, which further aids the dispersity and bioavailability.

Biography

Andrew Ebenazer has his expertise in Nanoencapsulation/ Nanoformulation of active compounds, toxicity studies on target and non-target organisms and biosafety studies. Further have a hands on expertise in developing the rapid qualitative, and quantitative analytical methods. Proficiency in handling, troubleshooting LCMS, Preparative HPLC, Analytical HPLC, UPLC, UHPLC, flash chromatography systems. A consultant in providing ecosafety solutions and industry oriented training workshops.