Process Optimization of the Production of Liposomal Carriers for Enhancing the Solubility of the Quercetin-Aglycon

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Phospholipids are amphiphilic molecules that spontaneously form bilayer vesicles in aqueous solution. Those liposomes can encorporate lipophilic substances in their bilayer membrane and hydrophilic compounds in their aqueous core[1]. These properties make liposomes ideal carriers for functional compounds for application in cosmetics, pharmaceutics and also functional foods. Liposomes can protect bioactive compounds from deterioration processes from the surrounding matrix, can provide controlled release and may enhance the bioavailability of a drug or nutraceutical[2].

Quercetin is kown as a potent functional compound to lower oxidative stress, subsequent inflammatory events in the human body and the resulting diseases[3]. However, the bioavailability of quercetin orally administered as the aglycon is very low due to its poor water solubility. Enhancing the solubility by encapsulation of the quercetin aglycon into a liposomal carrier is a possible application in a functional food product[4,5]. The production method as well as phospholipid to quercetin ratio are important factors that determine the size and lamellarity of the lipsomes as well as the encapsulation efficiency and capacity[4]. These factors were evaluated with regard to process optimization. For the application of bilayer vesicles in foods also the stability and oxidative status are important factors that limits shelf-life stability and the barrier function of the membrane bilayer.

To evaluate the above mentioned parameters physical tests like dynamic light scattering and zeta potential measurements were conducted. Chemical tests like size exclusion chromatopgraphy with subsequent high performance liquid chromatography were accomplished for quercetin encapulation measurements. Furthermore, the oxidative status of the samples was followed.

References
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