

Giant liposomes containing resistant starch for probiotics

microorganisms encapsulation: Preparation and characterization



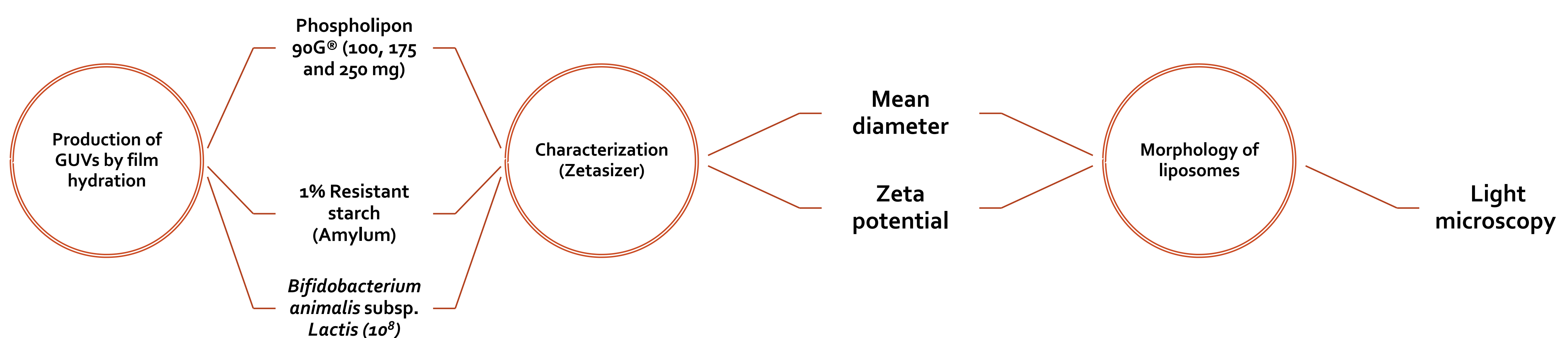
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INTRODUCTION

The probiotic pathway through the gastrointestinal tract is not smooth, and due to the adverse conditions (e.g., low pH, bile salts, enzymes, peristaltic motion, etc.) that probiotic microorganisms are exposed, their survival is at risk, making delivering of viable cells a challenging task. In addition, probiotic bacteria are exposed to several challenges that compromise their survival during food processing and storage, such as oxidative stress, temperature, acid-base changes, etc. In this sense, encapsulation technology has an excellent potential for prolonging the shelf-life of probiotics cells in food products and as a way of enhancing the resistance of bacterial strains in the gastrointestinal tract. Here, our aim was to demonstrate the probiotic microorganism encapsulation in liposomes by using the thin-film hydration technique with some modifications.

MATERIAL AND METHODS



RESULTS AND DISCUSSION

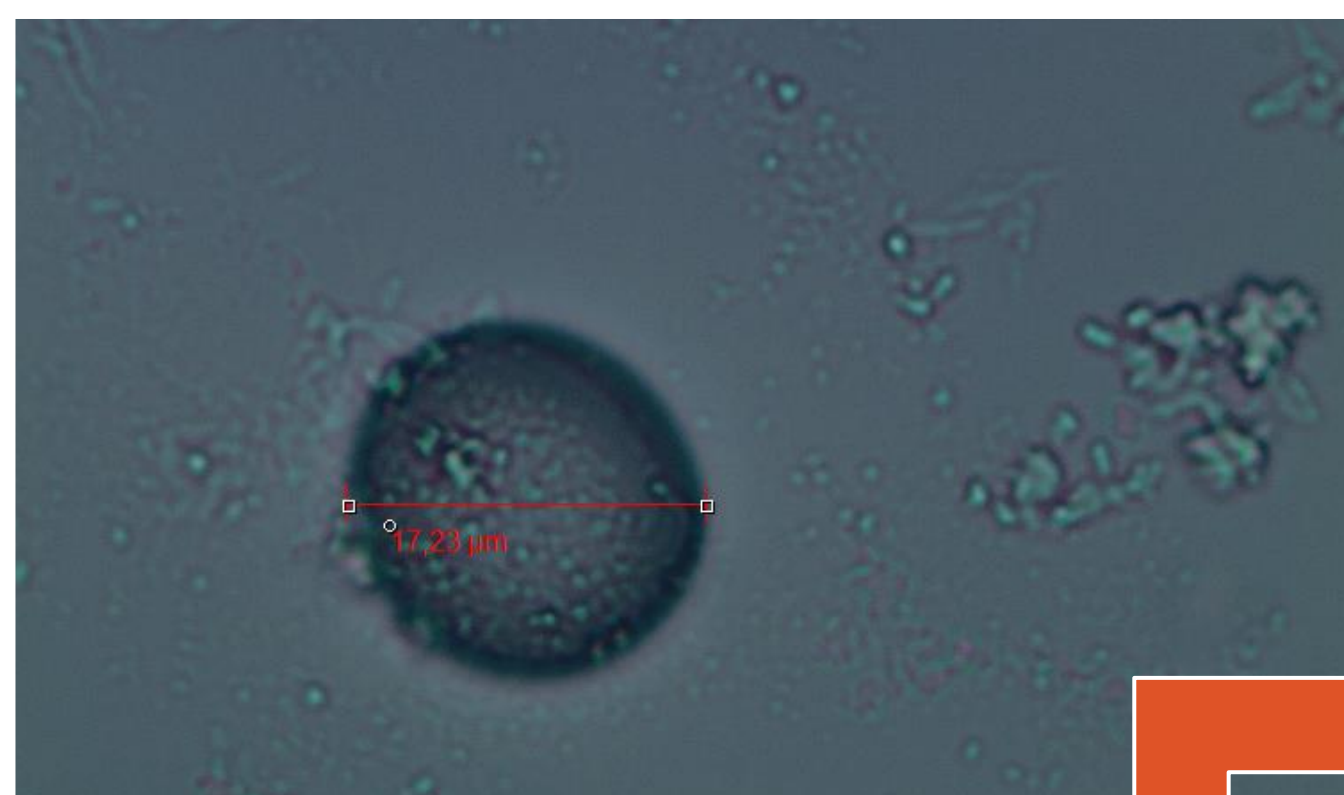


Fig. 1. Microscopy images of giant liposomes encapsulating *Bifidobacterium animalis* subsp. *Lactis*.

Resistance starch is a type of starch cannot be digested by amylases in the small intestine and passes to the colon to be fermented by microbiota, favoring the encapsulation of probiotics. The method generated giant liposomes (GUVs) and allowed an encapsulation of *Bifidobacterium animalis* subsp. *Lactis*, showing a well-defined spherical shape, with sizes ranging from 2.8 to 3.6 μm and zeta potential around -14 mV. Thanks to these favorable features, GUVs containing RS can be a promising alternative for the survival of probiotics in functional foods, nutraceutical, and pharmaceutical products.

GUVs	Diameter (μm)	Zeta Potential (mV)
100 mg	2.8 \pm 0.6	-14.6 \pm 0.2
175 mg	3.6 \pm 0.5	-13.1 \pm 0.3
250 mg	3.3 \pm 0.5	-15.2 \pm 0.4

Table 1. Physical characteristics of giant liposomes encapsulating probiotic microorganism.

References

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