

Exploration of W/O/W type double emulsion and its application to Lactobacillus casei

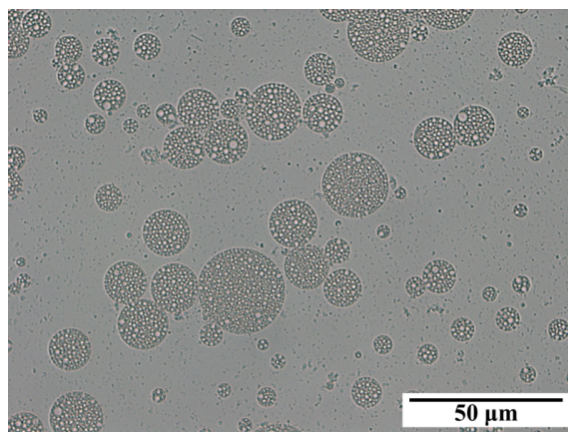
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Water-in-oil-in-water (W1/O/W2) emulsions are common types of double emulsions formed when a water-in-oil emulsion is dispersed as oil globules in a continuous aqueous phase (W2). There has been increasing interest in W1/O/W2 emulsions due to their ability to entrap and protect hydrophilic substances and control their release from the W1 to W2 phases, especially in various applications of food, pharmaceuticals, and cosmetics.

Lactobacillus casei harvested at the end of log phase was entrapped in the inner aqueous phase of a W1/O/W2 emulsion. In this study, we investigated the effects of different formulation and emulsification process on the stability and cell viability of the system. The optimal emulsification conditions were as follows 12000 rpm, 3 min, and 8000 rpm, 2 min. The number of viable cells was 5.6×10^8 CFU/ mL, the cell survival rate was 94% after this process. The viable cells within double emulsion could be keeping over 4.1×10^8 CFU / mL for 2 months of storage at 4°C.

The cell viability of the entrapped Lactobacillus casei in the double emulsion was compared to that of non-entrapped control cells under low pH and bile salt conditions. The control cells decreased significantly under low pH and bile salt conditions whereas the entrapped cells were rather stable by similar stress. It is concluded that the double emulsion could protect the Lactobacillus casei against simulated gastrointestinal tract conditions.



Biography

Nai-Yi Wang completed her Master's study specialization i.e., MS in Chemical Engineering from National Taiwan University of Science and Technology University, Taiwan. She obtained her Bachelor study specialization i.e., BS in Chemical Engineering from I-SHOU University in Taiwan.

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