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Physical Immobilization Liposomes in Uniform Zwitterionic Microgel Particles Fabricated in Microcapillary Device EUN SEON JEONG, ARAM BYUN, JIN WOONG KIM, Hanyang Univ — Lipid molecules have both hydrophilic and hydrophobic properties. Since their packing parameter ranges from 0.5 to 1, they self-assemble to form a vesicle structure, liposome. Thanks to the vesicle structure, liposome is able to encapsulate both hydrophilic and hydrophobic active ingredients, thus widening its applicability to pharmaceutical, cosmetic, and food industry. However, its vesicular structure is readily transferred to micelle in the presence of amphiphilic additives with low packing parameters. Therefore, it is critical to developing a technique to overcome this drawback. This study introduces a microfluidic approach to physically immobilize liposome in microgel particles. For this, we generate a uniform liposome-in-oil-in-water emulsion in a capillary-based microfluidic device. Basically, we observe how the flows in micro-channels affect generation of embryo emulsion drops. Then, the uniform emulsion is solidified by using photo-polymerization. Finally, we characterize the particle morphology, membrane fluidity, and mesh property, encapsulation efficiency and releasing.

Eun Seon Jeong
Hanyang Univ

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