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Fabrication of phospholipid vesicles from double emulsions in microfluidics INSUN YOON, Mount Holyoke College, ANDERSON H. SHUM, DAEYEON LEE, DAVID A. WEITZ, School of Engineering and Applied Sciences, Harvard University — Phospholipids self-assemble into lipid vesicles also known as liposomes. The formation of liposomes via conventional techniques such as electroformation has been studied extensively. However, the liposomes formed through electroformation are polydisperse and have low encapsulation efficiency. We present a new method to fabricate monodisperse phospholipid vesicles with high encapsulation efficiency from water-in-oil-in-water double emulsions. We generate phospholipid stabilized monodisperse double emulsions using a glass microcapillary device. This process allows efficient encapsulation within the inner aqueous drop. The middle oil phase is a volatile organic solvent in which phospholipids are dissolved. As the organic solvent evaporates, phospholipids self-organize into vesicles. This technique is versatile in the choice of phospholipids and we have generated vesicles from different types of phospholipids.

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