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liposomes fabrication using vortex rings generated microfluidic device

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Liposomes are phospholipid vesicles enclosing aqueous solution. Liposomes are used in many biomedical applications such as drug delivery and artificial cell models. Giant unilamellar vesicles (GUVs) fabrication using vortex ring in microfluidic device offers advantages over traditional GUVs fabrications such as rapid fabrication and controllable uniform vesicle sizes distribution. The phospholipid bilayer interface inside microfluidic reservoir is disturbed by collision of vertex rings producing by pulse injection in microchannel, leading to formation of droplet enclosed by phospholipid bilayer. Computational fluid dynamics simulation was carried out to vary phospholipid bilayer interface area and injection pulsing parameters in order to achieve desirable vortex ring sizes.

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