

The study on droplet generations via equipment free microfluidic systems

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Conventional droplet based on microfluidic systems are in need of some additional equipment; such as syringe pump, power supply and pressure source. Due to the additional equipment, the whole microfluidic systems require several tedious preparation steps and extra spaces for placing and operation. Here, we present generation of droplets in a novel equipment-free microfluidic systems based on sequential two-steps composed of device degassing and solution loading. We demonstrated some basic principles of power-free approach to generate droplets in equipment free microfluidic system. Performance of the equipment-free microfluidic systems were quantitatively studied by analysis of a volumetric flow rate, droplet generation rate and a distribution of generated droplet size over operating time. Furthermore, we control the direction of fluid by using alternation of air flow direction. We believe this study will overcome some experimental limitations of conventional microfluidic systems and it will suggest the possibility to be developed in equipment free approach microfluidic systems.