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**Strategic placement of an obstacle eliminates droplet break-up in the flow of a microfluidic concentrated emulsion** ALISON BICK, JIAN WEI KHOR, YA GAI, SINDY K. Y. TANG, Stanford University — Droplet microfluidics has enabled a wide range of high throughput applications, such as digital polymerase chain reaction (dPCR) and antibiotic screening. However, few studies have attempted to increase the throughput of the drop interrogation process. Previously, strategic placement of a circular post near a narrow exit reduced conflict between interactions among living organisms or particles. Inspired by such work, we placed a circular post close to the constriction entrance of a tapered microchannel. The results of our experiment demonstrate that the effects of this placement on droplet break up are noteworthy. If the obstacle position and size is properly selected, the probability that the droplet will break decreases by up to 99%, thereby enabling a 3-fold increase in drop interrogation rate. Droplet break-up depends on drop-drop interaction and drop deformation. Optimal obstacle placement immediately before? the constriction reduces drop deformation, which in turn reduces drop break-up. Strategic obstacle placement is therefore an attractive strategy for increasing droplet throughput.

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