Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

A method to generate picoliter droplets out of a microliter drop, on-demand using satellite formation[1] DUSTIN MOON, DO JIN IM, IN SEOK KANG, POSTECH — We investigated a simple, robust way to generate pico- to femtoliter drops out of a single 1microliter droplet for the use of generating monodisperse droplets in droplet-based microfluidics. A single drop is placed between glass substrates, immersed in silicone oil with different viscosities, moved with constant velocities from 50micron/s to 1500micron/s. As two plates separates, liquid bridge breaks and smaller droplets, or satellites are formed. We have found that for a fixed viscosity, nearly same size of droplets are generated over several orders of velocities. Using this method, single cell encapsulation is also possible without any other complex control and we successively captured a single Arabidopsis Protoplast with this method. This method can be used to divide smal l bio sample on-demand, to several smaller droplets for further analysis.

[1]This work was supported by the National Research Foundation (NRF) of Korea, and by the BK21 program of the Ministry of Education, Science and Technology (MEST) of Korea.

Dustin Moon
POSTECH

Date submitted: 07 Aug 2010 Electronic form version 1.4