

Integrated microfluidic platform for droplets array and fusion in single microfluidic device

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Pico- or nano-liter volumed droplets have come into the spotlight due to their great potential to provide new routes for scientist in field of diagnostic testing, nanoparticle synthesis. An individual droplet could be generated, transported, stored, mixed, analyzed. And it has numerous advantages such as less sample loss, less cross-contamination, fast diffusion.

Here, we describe a single microfluidic device that can generate droplets, array droplets into the array chamber at various combinations and fused droplets at the same time. This method readily allows us various reactions of parallel optical measuring and easily achievable real-time detection. We expect this configuration can be a powerful platform to study and optimize biological and chemical reactions. (e.g., kinetic study, crystalization)