

### Disc-based droplet formation for digital quantification of nucleic acids

김성현, 박현규<sup>†</sup>  
한국과학기술원  
(hgpark@kaist.ac.kr<sup>†</sup>)

Microdroplets provide miniaturized compartments for numerous biochemical reactions, and it enables absolute quantification of nucleic acids by digital analysis. Herein, we introduce the micro-milled disc-based centrifugal step emulsification for the fast, easy and cost-effective production of monodispersed droplets. Highly uniform droplets were generated in a short time, and its volume was controlled in a range from 0.38 nL to 17 nL. Fluorocarbon carrier oil usage was greatly reduced than the conventional machine by more than a factor of 5. Disc-based emulsification can enable molecular diagnostic system: proceed the isothermal nucleic acid amplification and absolute quantification of the target nucleic acid after droplet formation without any additional handling steps. Compared to conventional digital droplet PCR method, the overall process time and cost of analysis could be highly reduced.