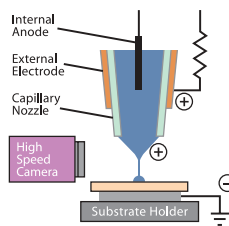


# Advances in micro-droplet technology may soon enable new micro-level processes...

## Smaller droplets, more precisely placed

Studying the optical properties of single molecules started Hamamatsu researchers thinking about micro-droplets—how to make them smaller and also more controllable...

They learned that by applying an electrical charge to the *exterior* of a tiny capillary nozzle as well as to the liquid inside, they could create a sharply pointed cone jet. And tightly *control* it.



Monitoring the process via computer-integrated high-speed optics, they could *very precisely* deposit even ultra-small droplets—much smaller than with ink-jet technology: With diameters down to  $1\mu\text{m}$ . And fluid volumes down to *femtoliter* ( $10^{-15}$

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liter) order. Even when using thick, viscous liquids!

### Enabling innovative new applications

This now opens the possibility of printing truly custom microcircuits, on demand, using gold nanosuspensions.

Or depositing micro samples in a tight array for optical analysis.

Or applying microscopic repairs to photomasks used in chip manufacturing. Or even creating whole new one-off photomasks for prototyping.

Droplet technology. One more way Hamamatsu is helping to open the new frontiers of Light.

<http://jp.hamamatsu.com/en/rd/publication/>

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Many thousands of times enlarged, this illustrates the creation of a Hamamatsu micro-droplet. Actual droplet diameters may be as small as a millionth of a meter.