Plasma cell treatment device *Plasma-on-Chip*:
Monitoring plasma-generated reactive species in microwells
(Supplementary Information)

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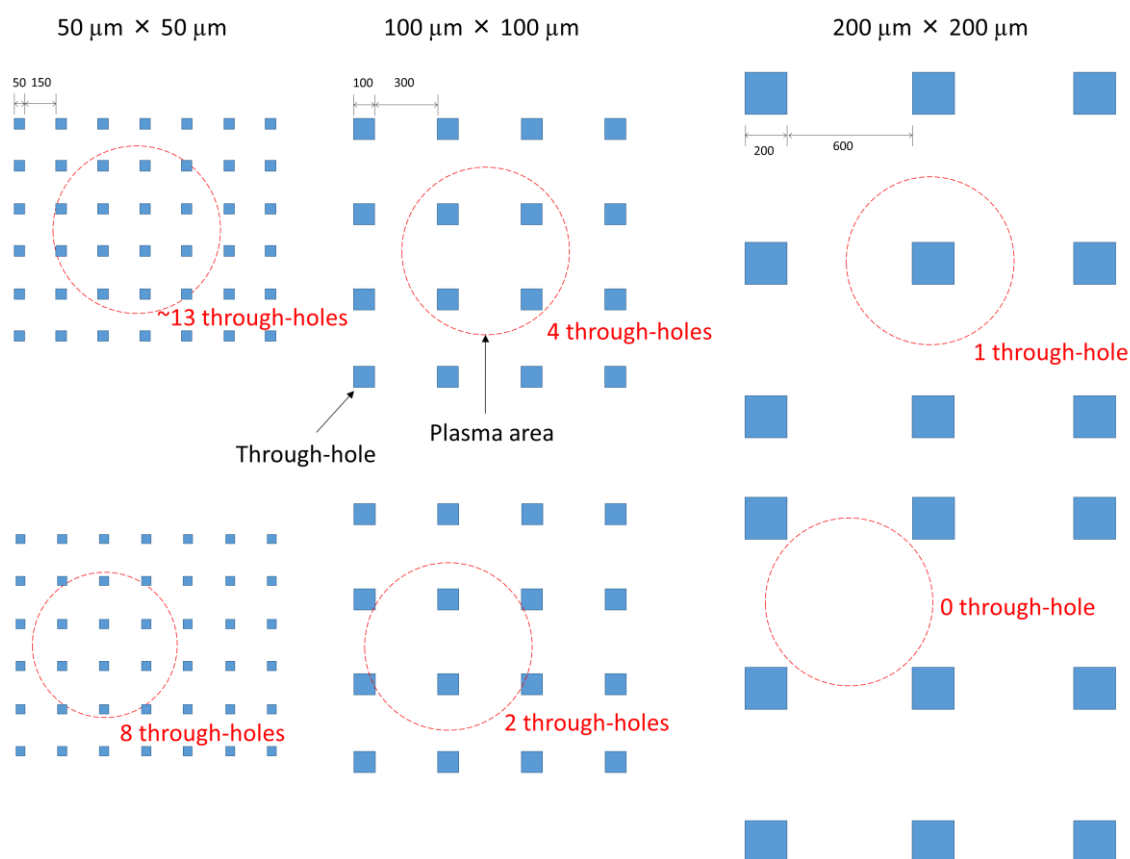
Figure S1 Schematic illustrations showing the plasma irradiation areas (circle) and through-holes (square).

(a)

Orifice

ϕ800 μm

5 mm

Periodic boundary

Through-Holes

Si Chip

Liquid

2.5 mm

(b) Inflow Area:

$$v_x = 0, v_y = 1, p = p_0$$
$$v_x = 0, v_y = 0, \frac{dp}{dy} = 0$$

Outflow Area:

$$\frac{dv_x}{dx} = 0, \frac{dv_y}{dx} = 0, \frac{dp}{dx} = 0$$

(c)

Outflow area:

$$\frac{dv_x}{dx} = 0, \frac{dv_y}{dx} = 0, \frac{dp}{dx} = 0$$

Si Chip Surface:

$$v_x = 0, v_y = 0, \frac{\partial p}{\partial n} = 0$$

Liquid

Gas-Liquid Interface:

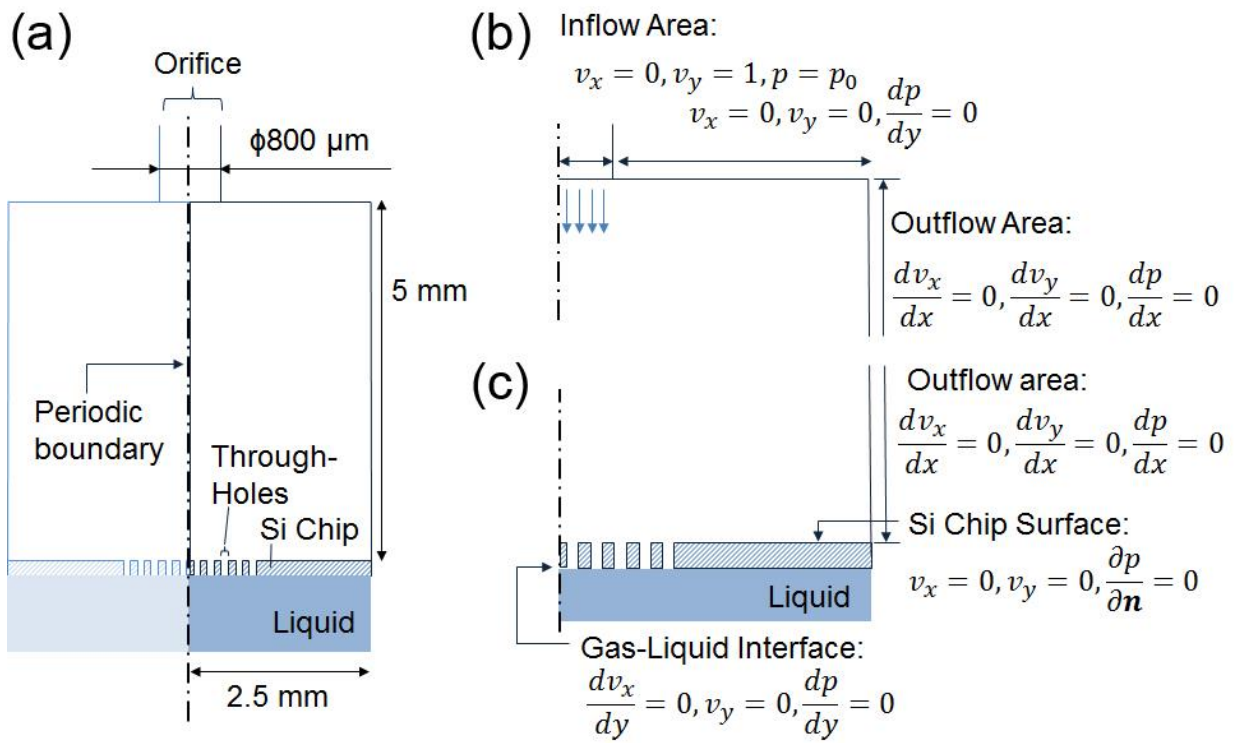$$\frac{dv_x}{dy} = 0, v_y = 0, \frac{dp}{dy} = 0$$

Figure S2. (a) Geometry of calculation area. A periodic boundary conditions is applied to the centre axis (indicated by the dashed line). Using the periodic boundary condition, half of the area is calculated. (b) Boundary conditions at inflow area. The vertical velocity is given at the orifice. (c) Boundary conditions in the vicinity of the through-hole device.