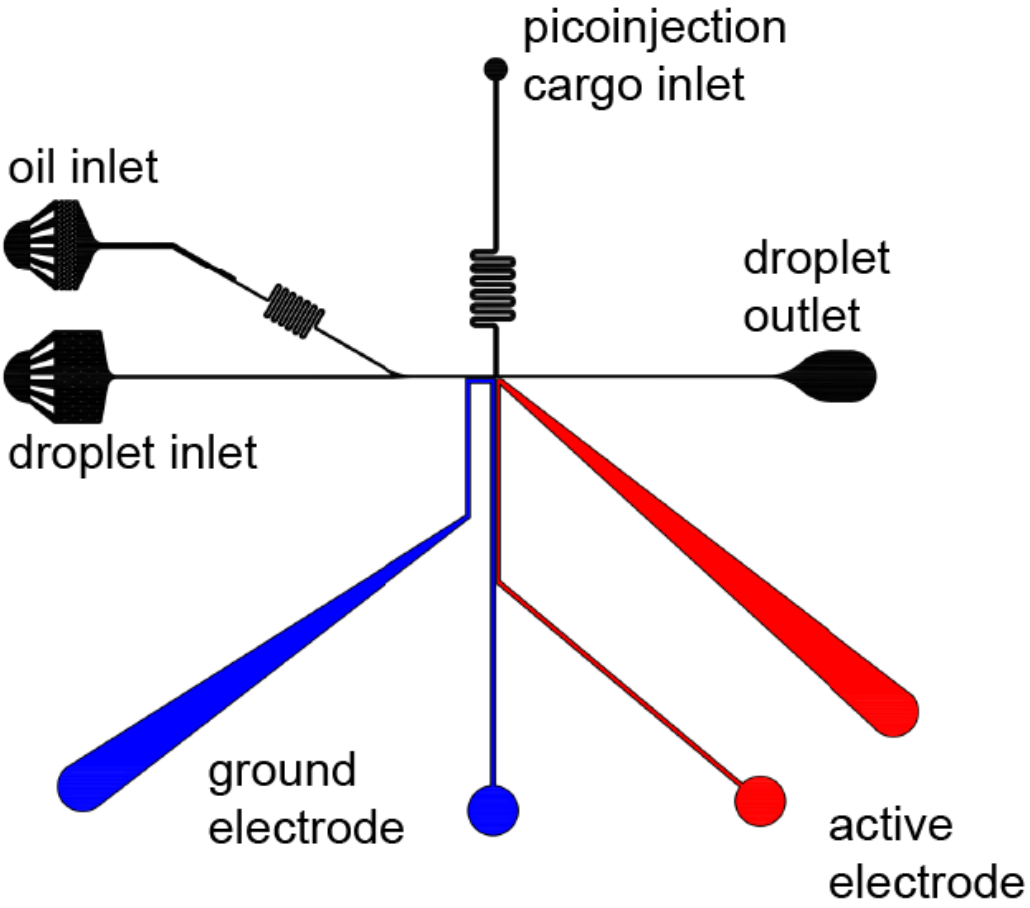
Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary Information

Rapid microfluidic platform for screening and enrichment of cells secreting virus neutralizing antibodies



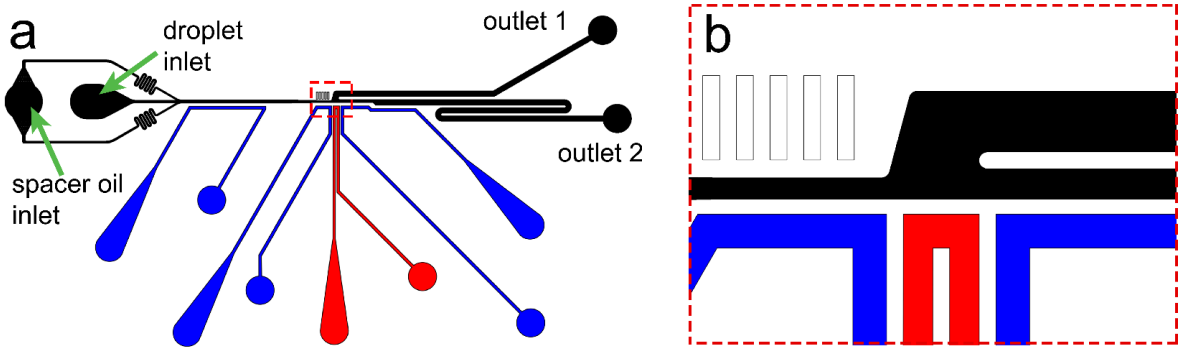
Supplementary Figure 1: Schematic of picoinjector used in study. Additional fluidic resistor was added into the picoinjection cargo channel to stabilize the injection process

Droplet media composition	Average droplet Ab concentration at 0 hour (µg/mL)	Average droplet Ab concentration at 24 hour (µg/mL)	Average Ab concentration of cell-containing droplets at 24 hour (µg/mL)
DMEM/F12 + 20% FBS	0.040	1.090	10.9
DMEM/F12 GlutaMAX supplemented + 20% FBS	0.049	0.923	9.23
DMEM/F12 + 20% FBS + 25mM HEPES	0.028	0.129	1.29
DMEM/F12 + 20% FBS + 0.1% Pluronic F68	0.007	0.555	5.55

Supplementary Table 1: The average concentration of nAbs recovered from the supernatant of droplets containing ASCs. 70 µm diameter droplets containing 10% singly-encapsulated ASCs were incubated for 24 hours to allow accumulation of nAbs prior to demulsification and quantification via ELISA. DMEM/F12 + 20% FBS (highlighted blue) was used for all in-droplet processes stated in the main text as it exhibited the best performance.

	Droplet diameter (µm)	**Estimated droplet volume (pL)**	**Estimated volume change (%)**
Original droplet size	70.62 ± 0.36	184.4	–
After 1st picoinjection	81.00 ± 0.92	278.3	+50.9
After 2nd picoinjection	89.70 ± 1.12	377.9	+35.8

Supplementary Table 2: Droplet diameter changes after two rounds of picoinjection (virus followed by host cells).



Supplementary Figure 2: (a) Schematic of sorter chip used in study. Blue electrodes represent ground electrodes while red electrode represents active electrode. (b) Magnified view of boxed region where sorting occurs.

	Average droplet signal	Median	95 percentile	99 percentile	99.2 percentile	99.5 percentile
Signal intensity (V)	0.240	0.229	0.386	0.470	0.480	0.502

Supplementary Table 3: PMT signal distribution of droplets containing 293T cells without virus.