

Figure S1. Photos of the system setup. a) Illustration of printing principles, where a piezoelectric cantilever strikes on a membrane, and liquid is squeezed out of the nozzle. b) Illustration of control system, and plug-and-play design of the cartridge holder.

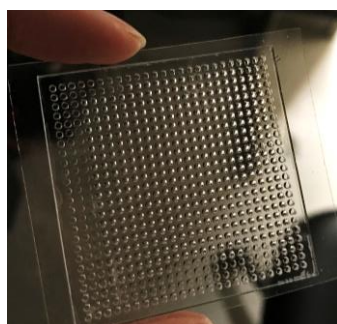


Figure S2. 25×25 multi-well plate made from PMMA. Central part of the plates are filled with synthetic cell free systems covered by oil.

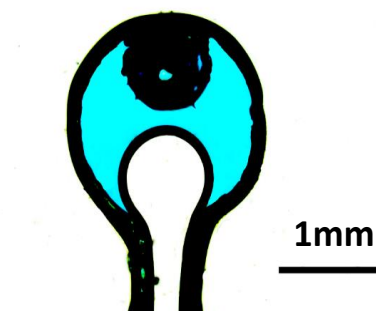


Figure S3. Real photo at the tip of a microfluidic channel in the cartridge, when liquid printing is finished. Only $0.25\mu\text{L}$ liquid dead volume is left, shown as the blue region.