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Supplementary Information

Volumeless reagent delivery: a liquid handling method for adding reagents to microscale droplets without increasing volume

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Fig. S1 (A) Exploded view of the VRD device constructed by cutting out a 43 x 60 mm rectangular hole on the bottom of an OmniTray well plate, followed by attaching a glass coverslip to the bottom surface of the plate via double-sided tape. (B) Image of the device for performing VRD (modified from a commercial OmniTray well plate) with dried spots of food dye and (C) the magnetic Fig. S2 ELR (accomplished via a PDMS silane modified glass surface with silicone oil) enables better droplet manipulation via PMPs compared to a non-ELR system (fluoro silane modified glass Fig. S3 Protein (IgG) recovery with VRD. (A) Fluorescence microscope images of dried Alexa Fluor 488 IgG spots before (left) and after (right) VRD reconstitution. Scale bar: 2 mm. (B) Quantified fluorescence of the Alexa Fluor 488 IgG spots from panel (A) images before and after VRD. Error bars denote the standard deviation from 3 technical replicates. NS: Not significant, calculated using Fig. S4 Bacterial growth-induced biofouling (droplet spreading) of non-ELR surface (fluoro silane modified glass with mineral oil) compared to no fouling/spreading observed on an ELR surface

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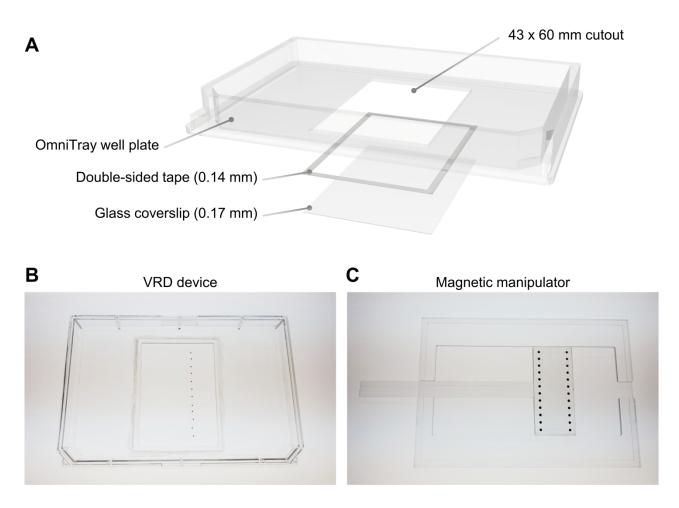


Fig. S1 (A) Exploded view of the VRD device constructed by cutting out a 43 x 60 mm rectangular hole on the bottom of an OmniTray well plate, followed by attaching a glass coverslip to the bottom surface of the plate via double-sided tape. (B) Image of the device for performing VRD (modified from a commercial OmniTray well plate) with dried spots of food dye and (C) the magnetic manipulator for performing PMP and droplet actuation.

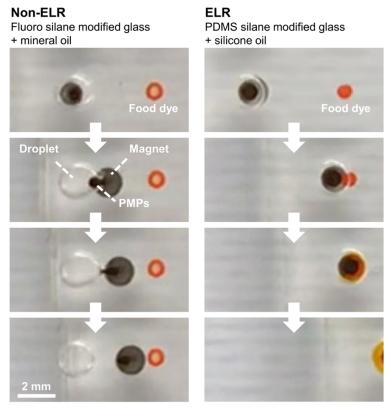


Fig. S2 ELR (accomplished via a PDMS silane modified glass surface with silicone oil) enables better droplet manipulation via PMPs compared to a non-ELR system (fluoro silane modified glass with mineral oil). Scale bar: 2 mm.

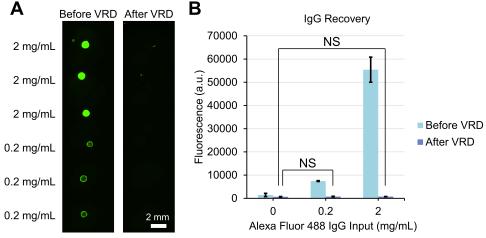


Fig. S3 Protein (IgG) recovery with VRD. (A) Fluorescence microscope images of dried Alexa Fluor 488 IgG spots before (left) and after (right) VRD reconstitution. Scale bar: 2 mm. (B) Quantified fluorescence of the Alexa Fluor 488 IgG spots from panel (A) images before and after VRD. Error bars denote the standard deviation from 3 technical replicates. NS: Not significant, calculated using 2-tailed Student's t-test.

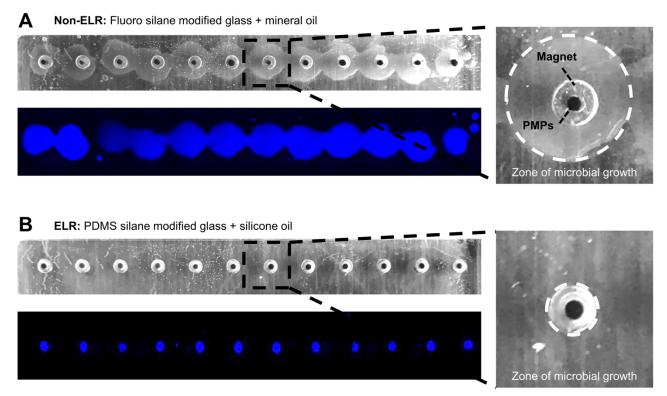


Fig. S4 Bacterial growth-induced biofouling (droplet spreading) of non-ELR surface (fluoro silane modified glass with mineral oil) compared to no fouling/spreading observed on an ELR surface (PDMS silane modified glass with silicone oil) after a 24 h culture. Bacteria used: *P. aeruginosa* CFP (strain PA01).