These Venn diagrams show the kinds of droplet species expected when the two detected molecules (A and B) are unlinked (panel a) or linked (panel b). Green indicates A-only droplets. Blue indicates B-only droplets. Orange indicates droplets containing both A and B.

(a) When the molecular species are unlinked, there are four categories of droplets: A, B, A+B and E (empty) droplets. Double-positive droplets (orange) arise only when A and B co-partition into the same droplet by chance.

(b) When the molecular species are linked, there are additional categories of double-positive droplets containing the linked species AB – on its own, or in combination with the unlinked A and B species that exist due to DNA fragmentation. Double positives can arise from any of these combinations (A+B), (A+AB), (B+AB), (A+B+AB), and (AB). Note that we directly observe only whether a droplet is positive or negative for A or B – the various classes of droplets shown in orange are not distinguishable in the assay. The mathematical analysis in Supplementary Note is therefore necessary to estimate the concentrations of the linked and unlinked species.