

iScience, Volume 29

Supplemental information

A digital microfluidic platform for cell-based non-invasive testing

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Supplemental Data :

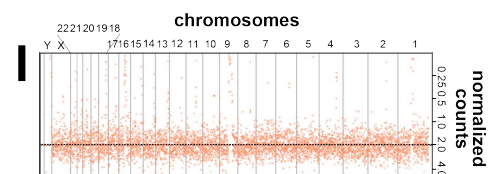
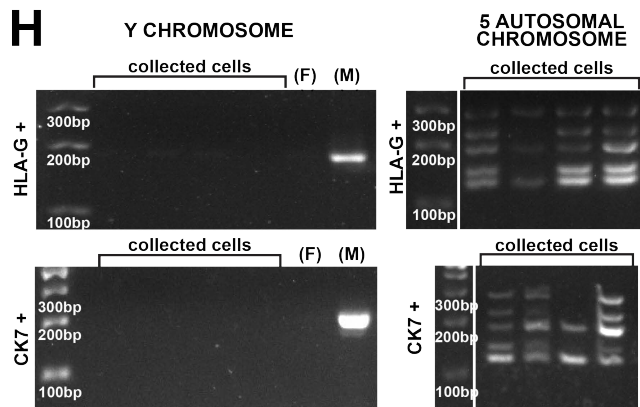
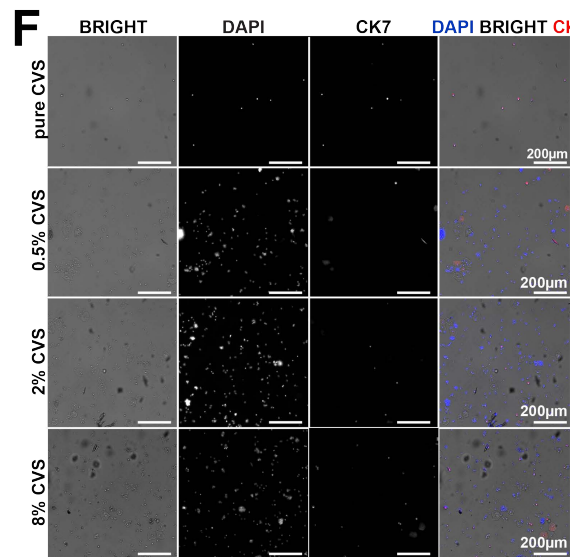
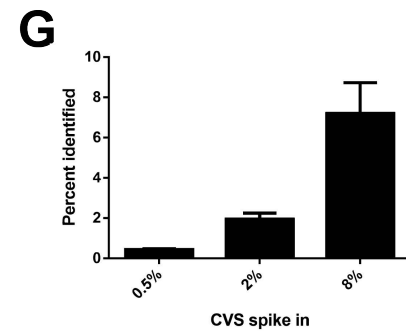
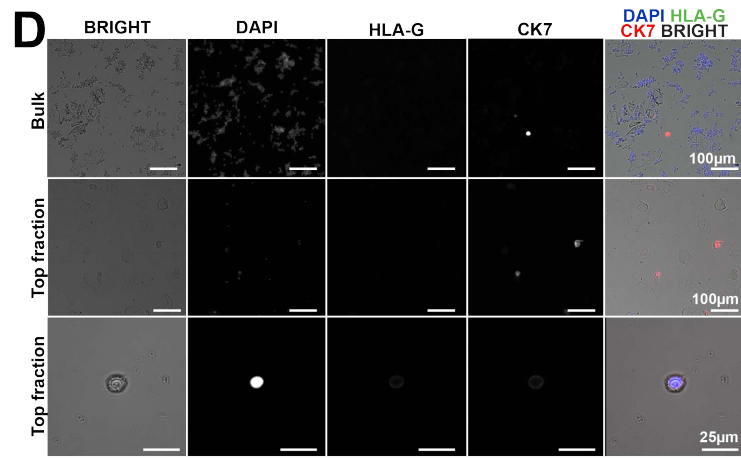
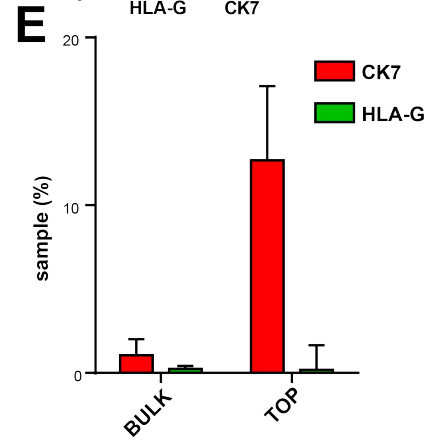
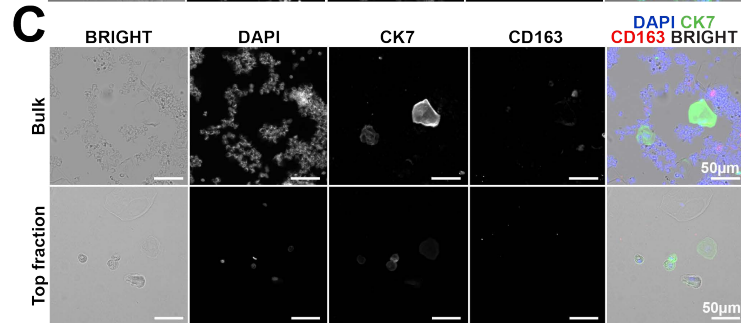
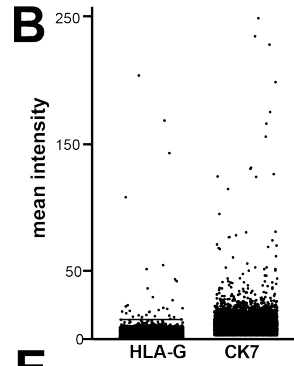
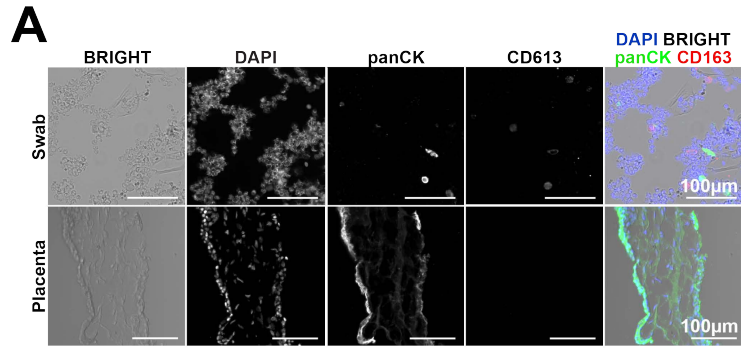


Figure S1: CK7+ and HLA-G are insufficient to identify fetal cells from cervical swabs.

A) Immunofluorescence staining (IF) of matched placenta and endocervical swab cells and samples of indicated markers. B) Quantification of HLA-G and CK7 signal in endocervical swab IF. n=4. C,D) IF of endocervical swabs cells in original bulk and top fraction. E) Quantification of HLA-G and CK7 signal in endocervical swab top and bulk fractions. n=4. F) IF of endocervical swabs spiked with known proportions of CVS cells. Pure CVS contains only CVS cells. G) Quantification of proportion of CVS cells identified in (F), n=3. H) Electrophoretic gel of Y chromosome and 5 autosomal chromosome PCRs of HLA-G+ and CK7+ cells from endocervical swabs. Collected cells: DISCO collected cells from endocervical swabs, (+): male control DNA, (-): female control DNA. Irrelevant lanes were removed between the ladder and cell lanes. Ladder sizes are indicated on the gel. I) Genome coverage of nanopore whole genome sequencing of single transcervical swab cells collected by DISCO. Error bars represent mean + SD and difference was determined using a two-tailed t test. Scale bar size indicated in each subpanel. Background intensity was equalized between channels to normalize for hydrophilic spot non-specific binding

Figure S3: Fetal DNA is detectable in transcervical swabs via DISCO.

A,B) SNP sequencing of polymorphic SNP panel. SNPs were filtered to retain differential SNPs between fetal and maternal samples. A) Combined plot of SNP allelic ratios and B) individual replicates with maternal and placental controls. Plac: fetal placenta, Mat: maternal samples, and DISCO: DISCO collected prospective fetal cells.

Table S1: Gestation age of study samples and associated experiments

Table S2: Antibody list

| Antibody | Dilution | Supplier | Catalogue # |
|-----------------------------------|----------|----------------|-------------|
| GATA3 (rabbit) | 1:200 | Cell signaling | 5852T |
| AP2 γ (rabbit) | 1:200 | Cell signaling | 2320S |
| AP2 α | 1:200 | Santa Cruz | sc-12726 |
| VGLL1 | 1:200 | Novus Bio | 31921 |
| HLA-G | 1:200 | BD Pharm. | 557577 |
| CK7 (rabbit) | 1:500 | Abcam | Ab53123 |
| CK7 (mouse) | 1:500 | Invitrogen | 14-9005-82 |
| panCK | 1:500 | BioLegend | 628601 |
| CD163 | 1:100 | Cell signaling | D6U1J |
| CGA | 1:200 | R&D | MAB4169 |
| Alexa Fluor 488 donkey anti-mouse | 1:500 | Invitrogen | A11001 |
| Alexa Fluor 647 donkey anti-goat | 1:500 | Invitrogen | SAB4600352 |
| DAPI | 1:1000 | Sigma-Aldrich | |

Table S3: Primer and SNP amplicon sequences

Table S4: SNP genotype summary