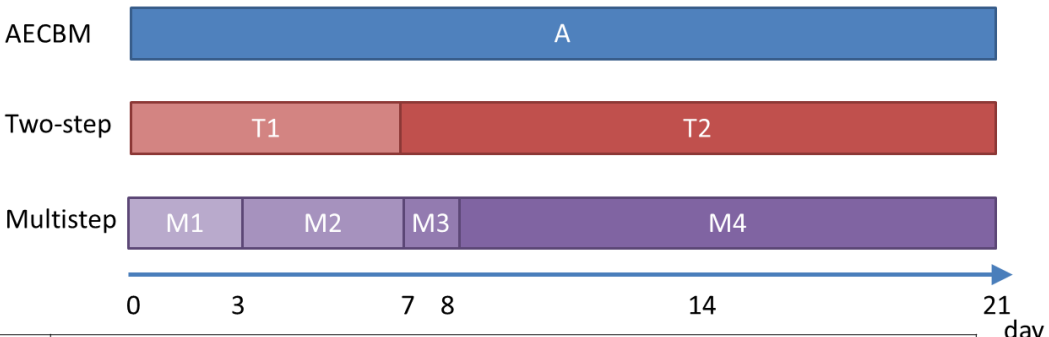
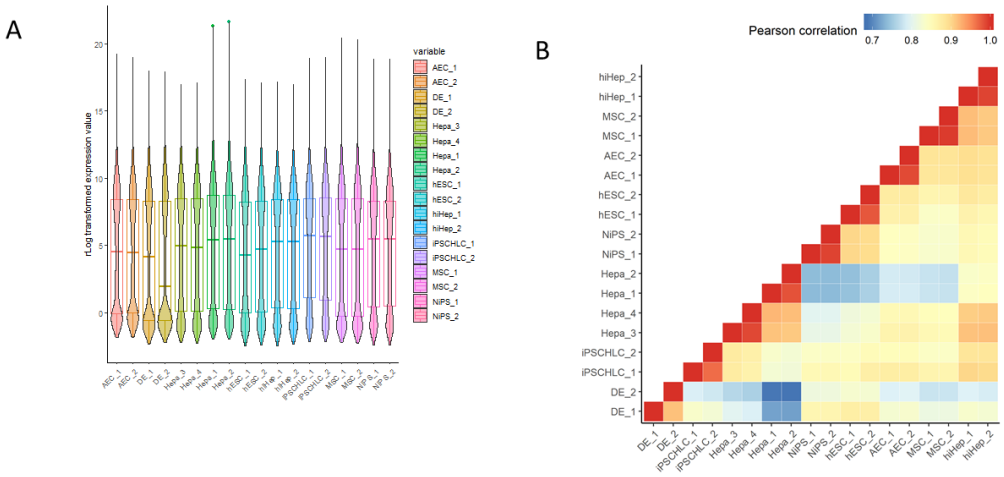


A	F12:DMEM (1:1) with FBS (10%), EGF (10 ng/ml), epinephrine (0.5 ug/ml), hydrocortisone (36 ng/ml), triiodo-L-thyronine (4 pg/ml), ITS, and Antibiotic-Antimycotic
T1	IMDM with FBS (10%), EGF (10 ng/ml), non-essential amino acids (1 mM), pyruvate (1 mM), L-glutamine (4 mM), and Antibiotic-Antimycotic
T2	T1 medium with dexamethasone (0.1 uM)
M1	RPMI1640 with acivin A (100 ng/ml), Wnt-3A (50 ng/ml), sodium butyrate (0.5 mM), B27 supplement, and Antibiotic-Antimycotic
M2	M1 medium without sodium butyrate
M3	IMDM:F12 (3:1) with EGF (10 ng/ml), VEGF (10 ng/ml), bFGF (10 ng/ml), HGF (20 ng/ml), dexamethasone (100 nM), oncostatin M (10 ng/ml), BSA (0.05%), glutaMAX (2 mM), monothioglycerol (0.45 mM), L-ascorbic acid (0.5 mM), N2 supplement , B27 supplement, and Antibiotic-Antimycotic
M4	M3 medium with nicotinamide (10mM)

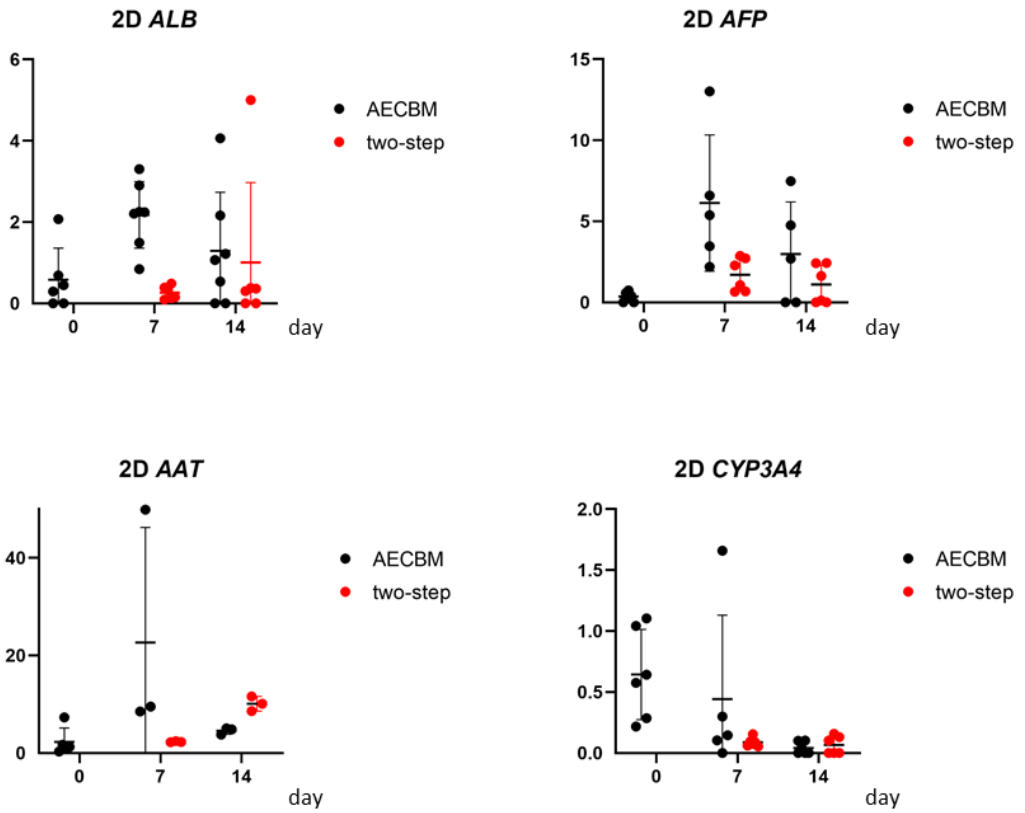
Supplementary Figure S1: Culture protocol for amniotic epithelial cells.

Three culture protocols were evaluated. In the amniotic epithelial cell basal medium (AECBM) protocol, the same culture medium was used for 21 d. In the two-step hepatic differentiation protocol, the medium was changed at day 7. In the multistep hepatic differentiation protocol, the medium was changed three times. Details of the culture medium constituents are listed below.



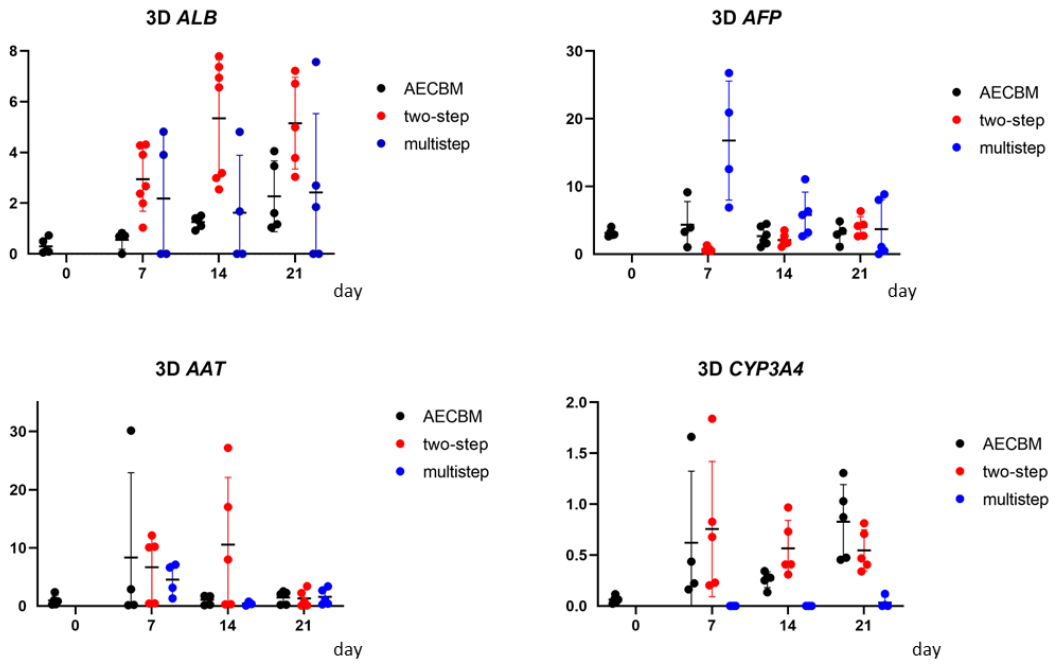
Supplementary Figure S2: Data normalization and RNAseq preparation.

A: after normalization of the gene expression profile, we verified the expression levels in each sample; B: expression profile repeatability in each cell type was verified with Pearson's correlation coefficient.



Supplementary Figure S3: Hepatic gene qRT-PCR data for the amniotic epithelial cell 2D culture.

Low hepatic marker gene expression levels were detected by qRT-PCR. The amniotic epithelial cell basal medium (AECBM) and two-step hepatic differentiation protocols were used. By day 28, the cells were detached and non-viable. Therefore, gene expression could not be evaluated at day 28.



Supplementary Figure S4: Hepatic gene qRT-PCR data for the amniotic epithelial cell 3D culture.

Low hepatic marker gene expression levels were detected by qRT-PCR. The amniotic epithelial cell basal medium (AECBM), two-step, and multistep protocols were used. Precultured amniotic epithelial cells (AECs) were used in this analysis. In the 3D culture, the AECs were still viable by day 28.