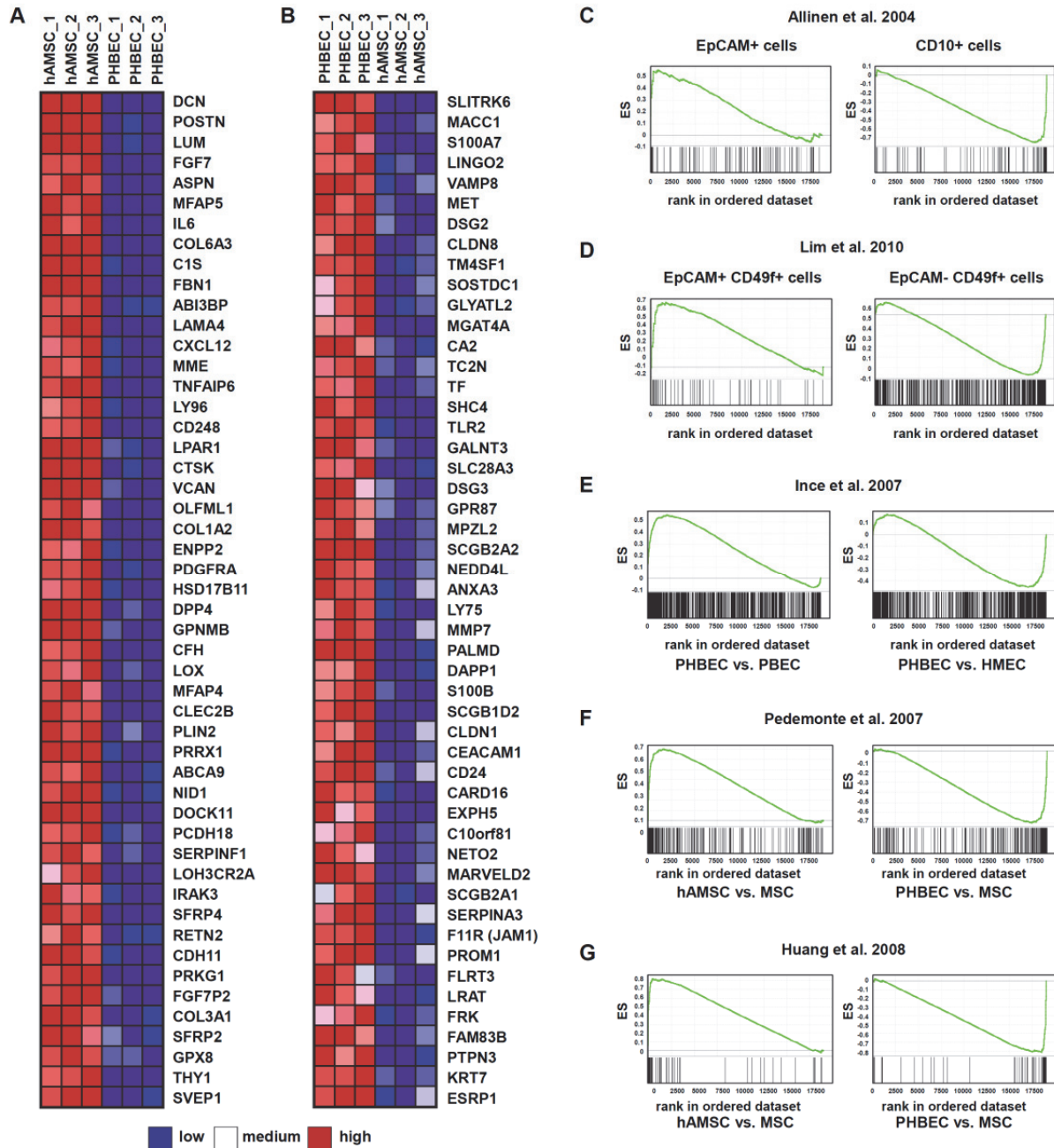




Additional file 4: (A, B) GSEA-ranked lists reveal that mesenchymal and epithelial genes are enriched in hAMSCs and PHBECs respectively. Heat maps representing the top 50 GSEA-ranked genes specific for monocultures of hAMSCs (Left) (n=3) and monocultures of PHBECs (Right) (n=3). (Red) upregulated; (Blue) downregulated; (White) average expression. **(C, D) PHBECs preserve their epithelial phenotype and display molecular characteristics of luminal progenitor cells when cultured in ex vivo conditions on ECM-coated meshes for 30 days.** (C) GSEA with PHBEC-specific genes and published signatures of EpCAM positive epithelial cells and CD10 positive myoepithelial and myofibroblast cells (Allinen et al., 2004). PHBEC/EpCAM+: ES=0.56, NES=1.96, FDR<0.001, $P<0.001$; PHBEC/CD10+: ES=-0.76, NES=-2.54, FDR<0.001, $P<0.001$ (D) GSEA with PHBEC-specific genes and published signatures of EpCAM positive and CD49f positive luminal progenitor cells and EpCAM

negative and a CD49f positive basal cell population (Lim et al., 2010). PHBEC/EpCAM⁺ CD49f⁺: ES=0.66, NES=2.11, FDR<0.001, $P>0.001$; PHBEC/EpCAM⁻ CD49f⁺: ES=-0.56, NES=-2.29, FDR<0.001, $P>0.001$ **(E)** GSEA with PHBEC-specific genes and published signatures of “BPEC” or “HMEC”, respectively 1. PHBEC/BPEC: ES=0.56, NES=1.53, FDR=0.01, $P=0.006$; PHBEC/HMEC: ES=-0.45, NES=-1.33, FDR=0.1, $P=0.09$. **(F, G) hAMSCs cultured in *ex vivo* conditions maintain mesenchymal stem cell gene expression profiles.** GSEA with hAMSC or PHBEC signatures and published MSC signatures. For Pedemonte et al.⁶⁰: hAMSC: ES=0.7, NES=1.38, FDR=0.13, $P<0.001$; PHBEC: ES=-0.7, NES=-1.4, FDR=0.097, $P<0.001$. For Huang et al.⁵⁹: hAMSC: ES= 0.82, NES=1.31, FDR=0.092, $P<0.001$; PHBEC: ES=-0.82, NES=-1.3, FDR=1.116, $P<0.001$. ES enrichment score, NES normalized enrichment score, FDR false discovery rate.