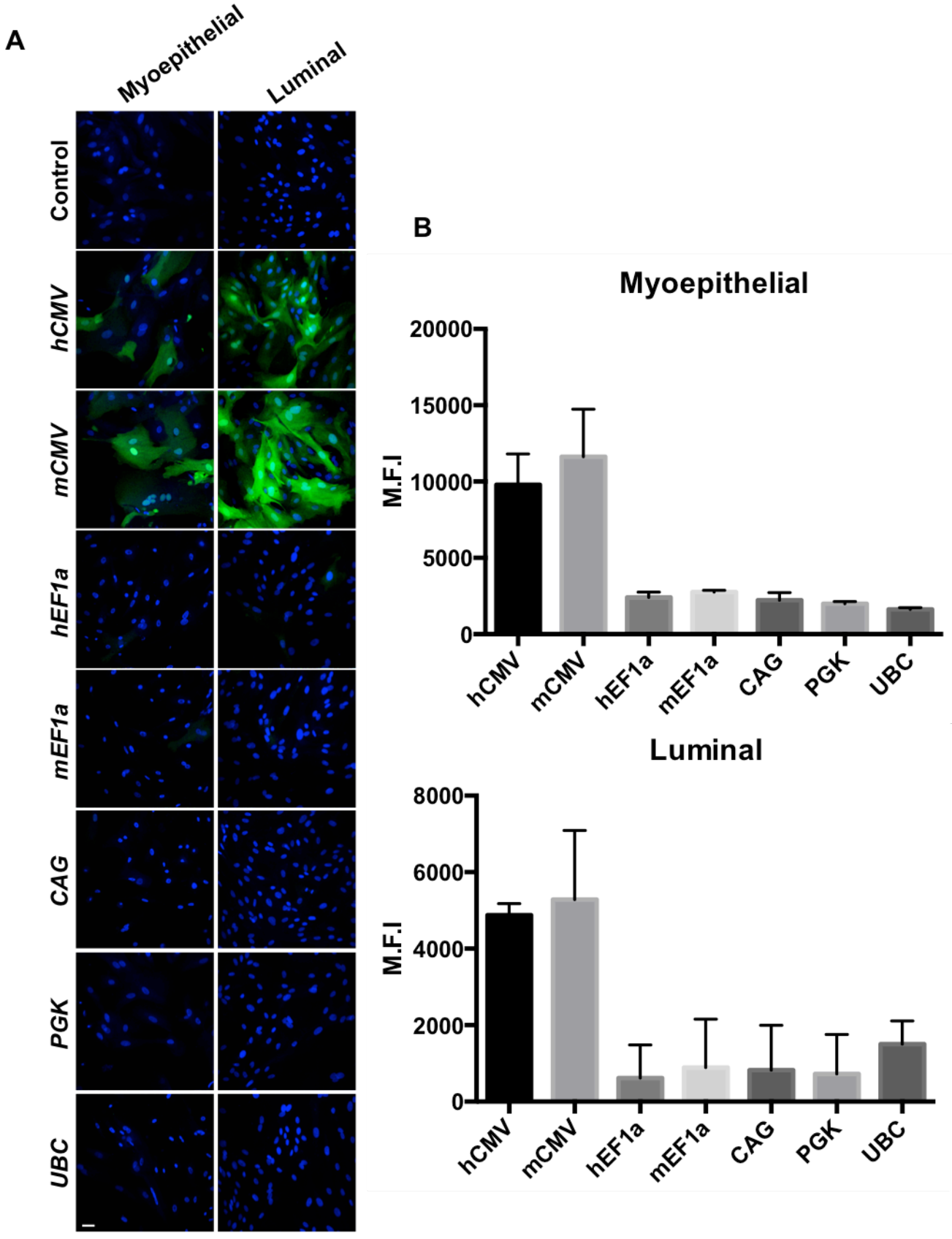
Supplementary Figure 1. Promoter efficacy in primary cultures of myoepithelial and luminal cells. A) Representative images of GFP expression in myoepithelial and luminal cells 48 hours following infection with neuraminidase-treated lentiviral particles driving GFP expression under either human/mouse *CMV*, human/mouse *EF1α*, *CAG*, *PGK* and *UBC* promoters. Scale bar = 20 μm. **B)** Mean fluorescence intensity (MFI) values of myoepithelial and luminal cells 48 hours post infection with lentiviral particles as in **A**. Images and values representative of cells derived from two donors.

Supplementary Figure 2. Spheroids formed in Matrigel cultures express markers of both luminal and myoepithelial cells. Expression of Cytokeratin (CK) 8 and P-Cadherin in spheroids formed in Matrigel from co-culture of isolated myoepithelial and luminal cells over 21 days. Images representative of cells derived from at least three donors. Scale bar = 20 μm.

Supplementary Figure 3. Objective and systematic calculation of cell and spheroid volumes. Representative workflow of spheroid analysis. Raw DAPI z-sections (**A**) are converted into grey-scale images and a grey-scale distribution profile (**B**). Grey-scale images are then converted to binary images using a calculated threshold to indicate cell presence (**C**). The pixels that indicate cells are then translated into a geometrically accurate point-cloud using the known image resolutions (**D**). Further post-processing using Density-Based Spatial Clustering of Applications with Noise (DBSCAN) is performed to identify the main body of cells (**E**). The point cloud representing the main spheroid is then extracted (**F**). The Alpha Shape algorithm is applied using thresholds set as a function of the image resolutions to form triangulated bodies that represent the cells and body (**G**). The volumes of these bodies are then calculated alongside the resultant cell/body ratio.

Figure S1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Luminal
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mCMV
hEF1a
mEF1a
CAG
PGK
UBC
B
Myoepithelial
M.F.I
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15000
10000
5000
0
hCMV
mCMV
hEF1a
mEF1a
CAG
PGK
UBC
Luminal
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hCMV
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CAG
PGK
UBC

Figure S2

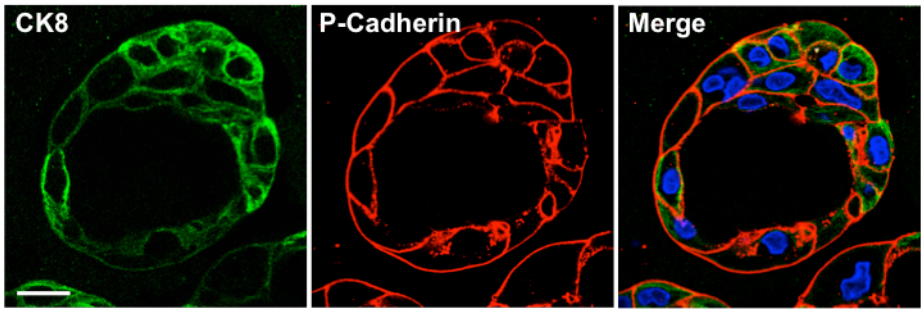
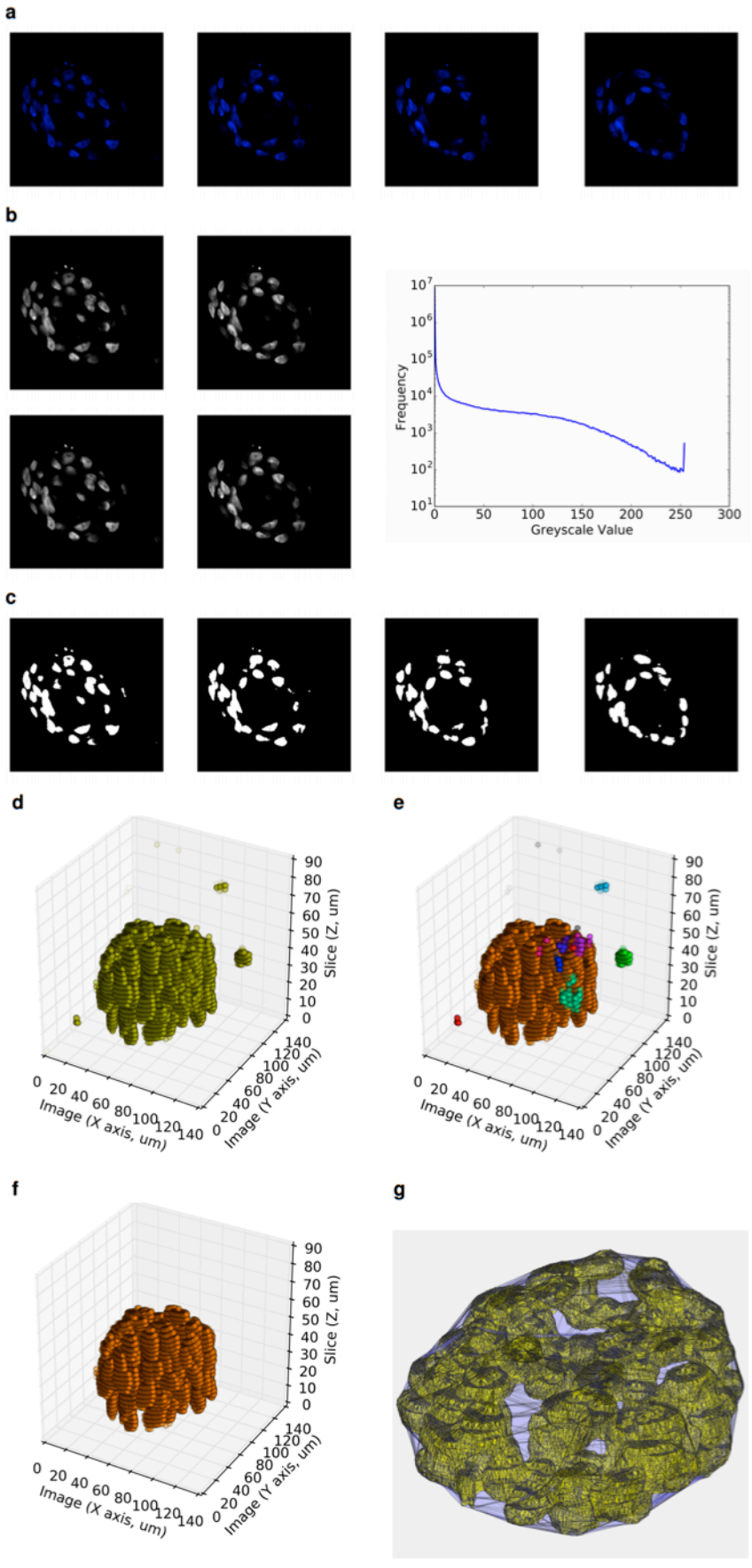


Figure S3


a
b
Frequency
Greyscale Value
c
d
e
f
g
Slice (Z, um)
Image (X axis, um)
Image (Y axis, um)