SUPPLEMENTAL MATERIAL

Table S1. List of media.

Media	Components
Human cCIC Media	10% ES FBS, 1% Penicillin-Streptomycin-Glutamine (100X), 5 mU/mL human erythropoietin, 10 ng/mL human recombinant basic FGF, 0.2 mmol/L L-Glutathione in F12 HAM's (1x)
Human MSC Media	20% FBS, 1% Penicillin-Streptomycin-Glutamine (100X) in 10.1 g/L Minimum Essential Medium Eagle, Alpha Modification
Human Fusin Media	15% ES-FBS, 1% Penicillin-Streptomycin-Glutamine (100X), 5 mU/mL human erythropoietin, 10 ng/mL human recombinant basic FGF, 0.2 mmol/L L-Glutathione, 0.2 mg/ml human IL-6, 0.25 mg/ml human LIF in F12 HAM's (1x)
KH Buffer	125 mmol/L NACL, 8 mmol/L KCL, 1.2 n mol/L KH_2PO_4, 1.25 m mol/L $mgSO_4$, 1.2 m mol/L $CaCl_2$, 6.25 m mol/L $NaHCO_3$, 20 m mol/L deoxy-glucose, 5 m mol/L Na-lactate, 20 m mol/L HEPS
NRCM Plating Media	15% FBS, 1% Penicillin-Streptomycin-Glutamine (100X) in medium 199
NRCM Maintenance Media	10% FBS, 1% Penicillin-Streptomycin-Glutamine (100X) in medium 199

Table S2. List of Antibodies.

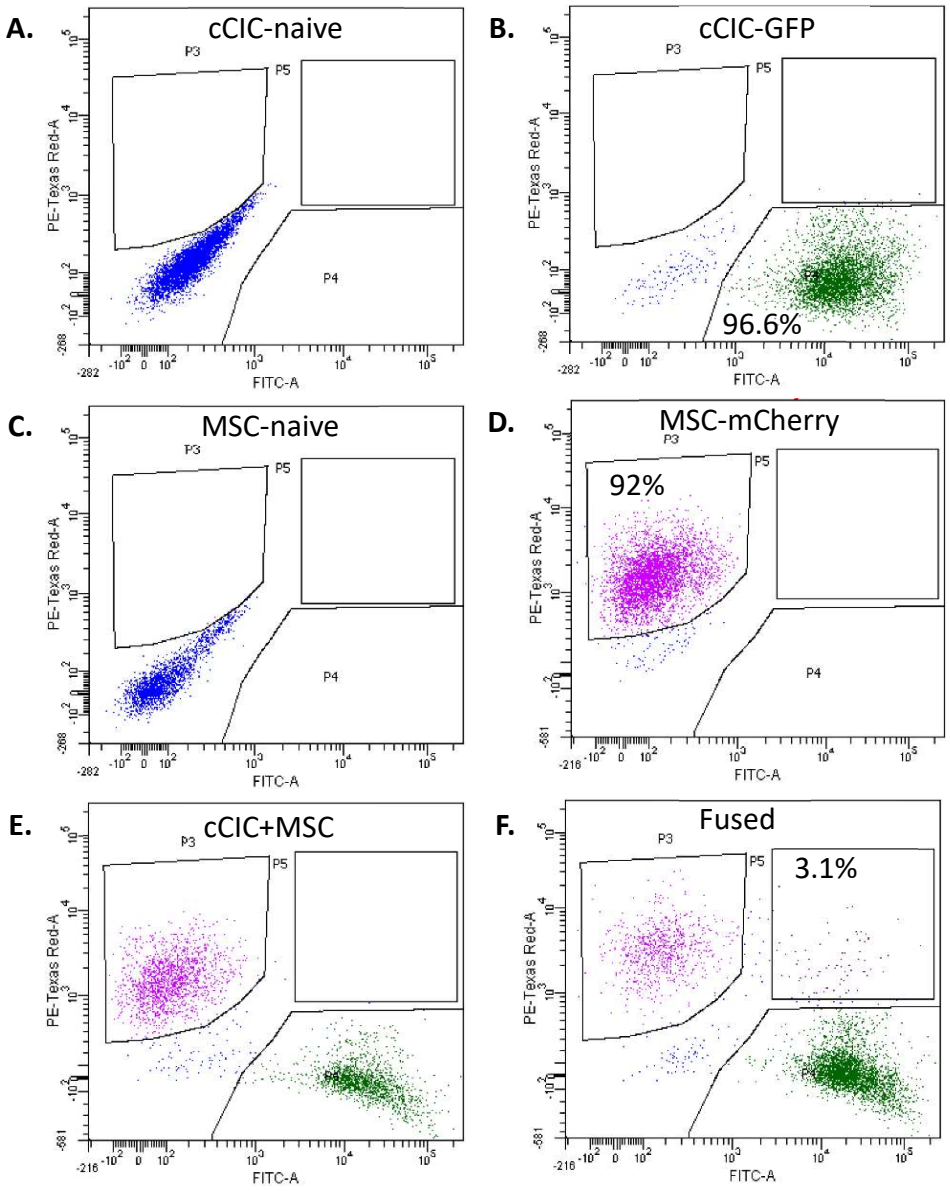
Antibody	Manufacturer	# Catalog	Dilution	Application
GFP anti rabbit	Thermofisher	A11122	1:80	Immunocytochemistry
mCherry anti Rat	Thermofisher	M11217	1:80	Immunocytochemistry
DAPI	Sigma	D9542	1:5000	Immunocytochemistry
GFP anti Goat	Rockland	35059	1:500	Immunoblotting
mCherry anti mouse	Abcam	Ab125096	1:500	Immunoblotting
GAPDH anti Goat	Sicgen	AB0067	1:3000	Immunoblotting
Annexin V-APC	Biosciences	550475	1:175	Cell death assay
Sytox Blue	Life Technologies	S11348	1:2000	Cell death assay
Propidium Iodide	Invitrogen	P3566	1:75	Ploidy analysis

Table S3. qRT PCR primer list.

mRNA Primers	Forward	Reverse
GATA 4	CTCAGAAGGCAGAGAGTGTGTCAA	CACAGATAGTGACCCGTCCCAT
TNNT2	GGAGAGAGAGTGGACTTTATG	CCTCCTCTTTCTTCCTGTTTC
PECAM1	CCAAGCCCGAACTGGAATCT	CACTGTCCGACTTTGAGGCT
SMA	CCCAGCCAAGCACTGTCAGGAATCCT	TCACACACCAAGGCAGTGCTGTCC
HB-EGF	ACAAGGAGGAGCACGGGAAAAG	CGATGACCAGCAGACAGACAGATG

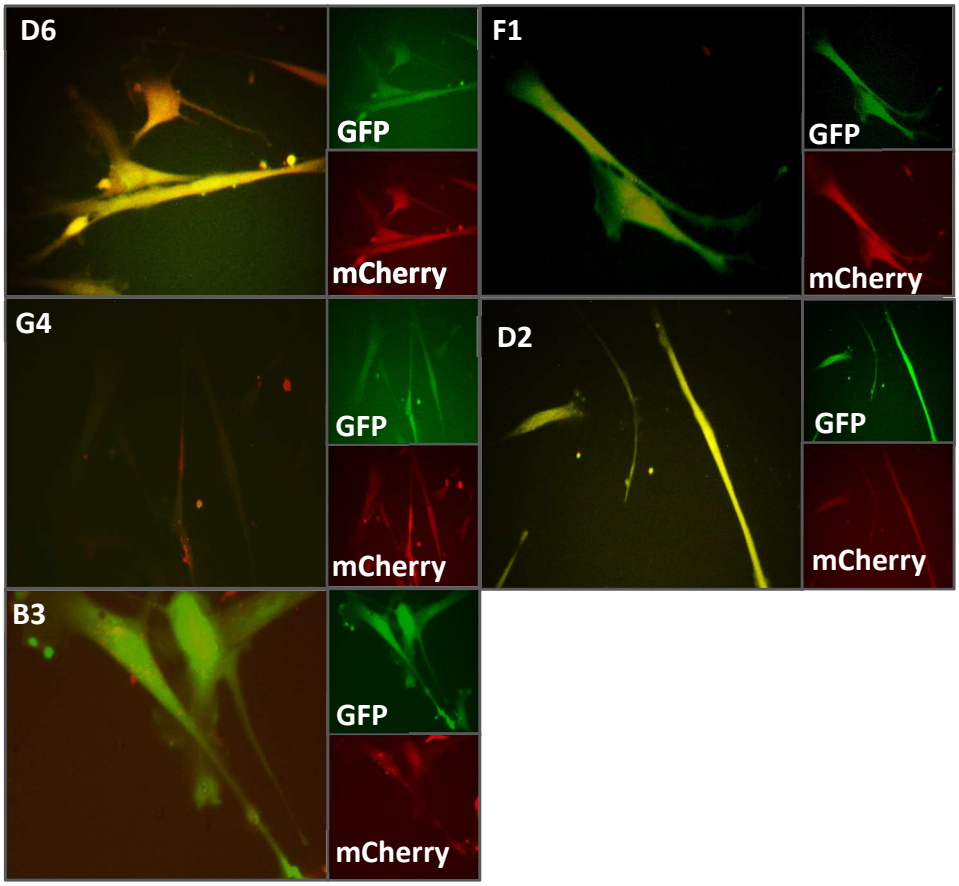
HGF	GGCTGGGGCTACACTGGATTG	CCACCATAATCCCCCTCACAT
SDF	CAGTCAACCTGGGCAAAGCC	AGCTTTGGTCCTGAGAGTCC
FGF2	CTGGCTATGAAGGAAGATGGA	TGCCCAGTTCGTTTCAGTG
18s	CGAGCCGCCTGGATACC	CATGGCCTCAGTTCCGAAAA

Figure S1. Flow cytometry plots of one representative fusion experiment including



A. naive cCICs, **B.** cCIC-GFP, **C.** naive MSCs, **D.** MSC-mCherry, **E.** the combinatorial cCIC and MSC group as the negative control and **F.** Sendai virus-induced fused cells.

Figure S2. Live native fluorescent images of hCCs illustrating double positivity of the fused cells.



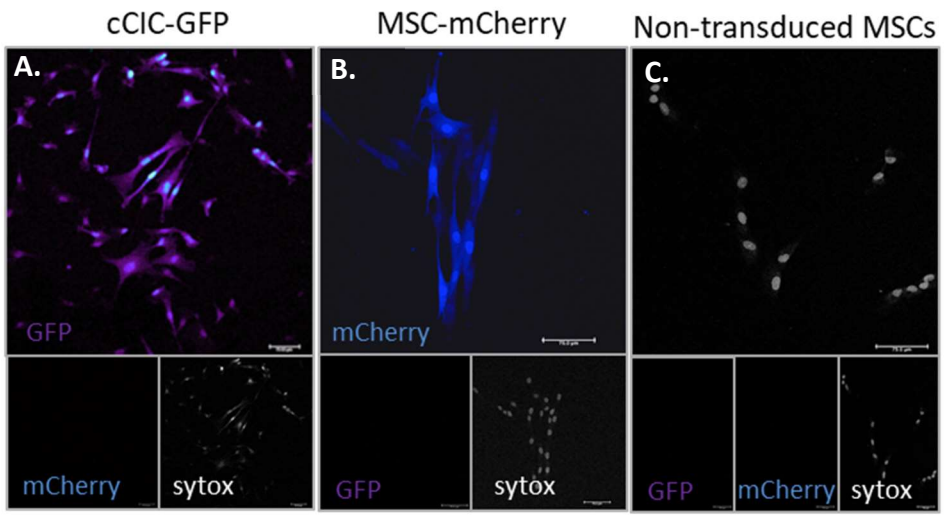


Figure S3. Immunocytochemistry images of A. cCIC-GFP, **B.** MSC-mCherry, and **C.** Non-transduced MSCs stained for GFP and mCherry. Sytox green was used as the nuclear stain.

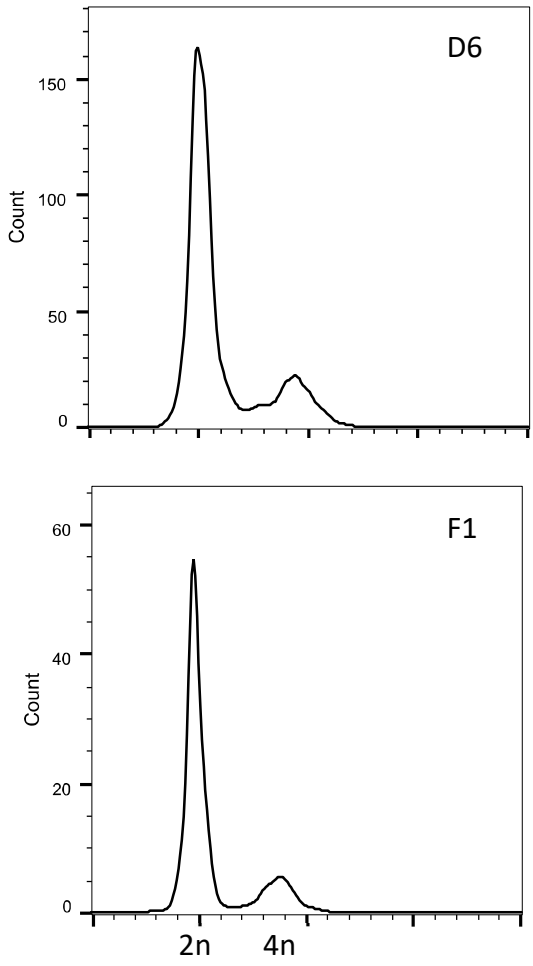
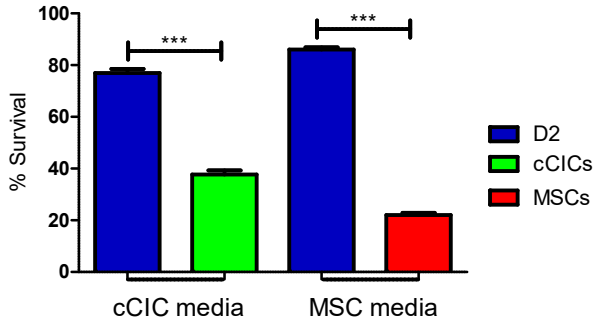


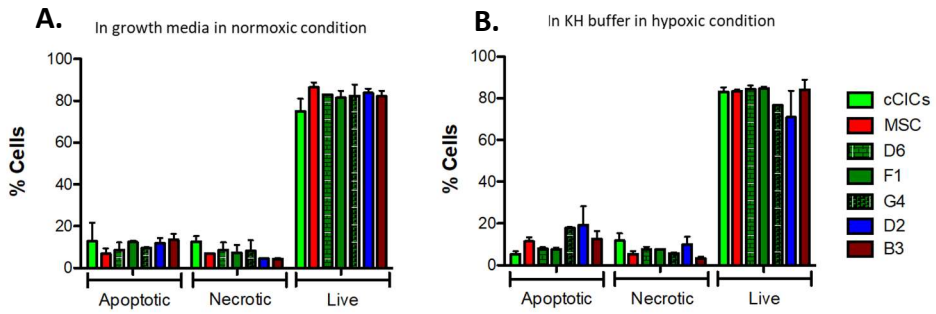
Figure S4. Flow Cytometry plots for PI/RNAse staining of hCCs D6 and F1.

Figure S5. Percentage of survival (live cells) of D2 clones in cCIC media, cCICs in cCIC media, D2 clones in MSC media and MSCs in MSC media (from left to right) after treatment with hydrogen peroxide (350 µmol/L).



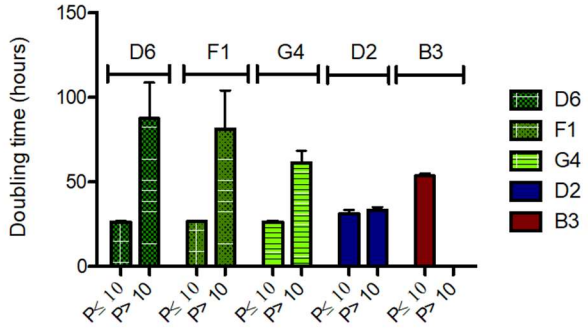
Error bars are ± SEM. *** $p<0.001$

Figure S6. Percentage of apoptotic, necrotic and live cells.



A. cultured in growth media in normoxic condition and **B.** subjected to KH buffer in hypoxic condition. Error bars are ± SEM.

Figure S7. Cell doubling time of hCCs up to and after passage 10 in culture represented in hours.



Error bars are ± SEM.