

Supplementary Table S1. Material Used for Cell Isolation, Expansion and Experiments.

Name	Source	Concentration
1-ethyl-3(3-dimethylaminopropyl) carbodiimide (EDAC)	Pierce	6.15 mg/mL
0.05% Trypsin-EDTA (T/E)	Invitrogen, Grand Island, NY	0.25% and 1mM
Amphotericin B	Invitrogen, Grand Island, NY	50µg/mL
AMD3100	Sigma-Aldrich, St Louis, MO	20 µg/mL
Bovine serum albumin (BSA)	Sigma-Aldrich, St Louis, MO	40 mg/mL
Collagenase A	Roche, Indianapolis, IN	2 mg/mL
Covalink-NH 96 wells	Thermo-Fisher Scientific, Waltham, MA	
DMEM	Invitrogen, Grand Island, NY	DMEM/F-12 (1:1)
Dimethyl Sulfoxide	Sigma-Aldrich, St. Louis, MO	0.1%
CsCl	Sigma-Aldrich, St. Louis, MO	gradient
Dispase	Thermo Fisher Scientific, Indianapolis, IN	10 mg/ml
DTT	Sigma-Aldrich, St. Louis, MO	100 mM
Fetal Bovine Serum	Atlas, Fort Collins, CO.	100% Bovine Serum
Gentamicin	Invitrogen, Grand Island, NY	1.25 µg/mL
Sodium hyaluronate (HA)	Abbott, Santa Ana, CA	20 µg/mL
Hyaluronidase	Sigma-Aldrich, St Louis, MO	1 U/µg
Human Fibroblast Growth Factor-Basic	Invitrogen, Grand Island, NY	4 ng/mL
Insulin-Transferrin- sodium selenite (ITS) media supplement	Roche, Indianapolis, IN	5 µg/mL Insulin, 5 µg/mL Transferrin, 5 ng/mL Sodium Selenite
MgSO ₄	Sigma-Aldrich, St. Louis, MO	powder
NaCl	Sigma-Aldrich, St. Louis, MO	powder
NE-PER Nuclear and Cytoplasmic Extraction Reagents	Thermo Fisher Scientific (Indianapolis, IN)	Kit
Phosphate-Buffered Saline pH 7.4 (PBS)	Invitrogen, Grand Island, NY	1X
Paraformaldehyde	Sigma-Aldrich, St Louis, MO	4%
Proteinase Inhibitors	Sigma-Aldrich, St Louis, MO	10 mM EDTA 10 mM aminocaproic acid 10 mM N-ethylmaleimide 1 mM PMSF
RNeasy Mini Kit	Qiagen, Valencia, CA	Kit
SB431542	Sigma-Aldrich, St Louis, MO	10 µM
Sulfo-NHS	Sigma-Aldrich, St Louis, MO	9.2 mg/mL
The BCA Protein Assay Kit	Life Technologies, Grand Island, NY	Kit
The enzyme-linked immunosorbent HA Quantitative Test Kit	Corgenix, Broomfield CO	Kit
Triton X-100	Sigma-Aldrich, St Louis, MO	0.2-0.9 mM
Trypsin	Sigma-Aldrich, St Louis, MO	0.25%

Supplementary Table S2. Primer and Probe Sequence Use for Quantitative Real-Time PCR.

Gene Name	Assay ID (TagMan Expression Assay)	Product Length
Bmp4	Hs03676628_s1	116
Bmp6	Hs01099594_m1	108
BMPR1A	Hs01034913_g1	94
BMPR1B	Hs01010965_m1	76
BMPR2	Hs00176148_m1	69
CXCR4	Hs00607978_s1	153
GAPDH	Hs02758991_g1	93
Keratocan	Hs00559942_ml	67
SDF-1	Hs00171022_m1	77
TGFβ1	Hs00998133_m1	57
TGFβ2	Hs00234244_m1	92
TGFβ3	Hs01086000_m1	63
TGFβR1	Hs00610320_ml	73
TGFβR2	Hs00234253_ml	70
TGFβR3	Hs00234257_ml	60

Supplementary Table S3. Primary and Secondary Antibodies Used for Immunofluorescence Staining.

Primary Antibodies			
Antibody	Supplier/Catalog (City, State)	Source	Dilution
α -SMA	Abcam/ 5694 (Cambridge, MA)	Rabbit	1:100
β -actin	Sigma-Aldrich, St. (Thr 8) Louis, MO	Mouse	1:100
CXCR4	Abcam/ 44716 (Cambridge, MA)	Mouse	1:100
Activated Integrin β 1	Sigma-Aldrich/MAB20792 (St Louis, MO)	Mouse	1:1000
FAK (Tyr 397)	Cell Signaling/3283S (Danvers, MA)	Rabbit	1:1000
FAK	Cell Signaling/3285S (Danvers, MA)	Rabbit	1:1000
Hoechst 33342	Sigma-Aldrich/B2261 (St Louis, MO)	N/A	1:500
Histone	Abcam ab70048 (Cambridge, MA)	Rabbit	1:500
ITIH1 (HC1)	Abcam ab70048 (Cambridge, MA)	Mouse	1:100
SDF-1	R&D System MAB350 (Minneapolis, USA)	Mouse	1:100
Mouse IgG	Agilent Dako/X0910 (Santa Clara, CA)	-	1:100
PTX3	Enzo Life Science ALX-210-365 (Farmingdale, NY)	Rabbit	1:100
pSMAD2/3	Sigma-Aldrich, St. (Thr 8) Louis, MO	Rabbit	1:100
pSMAD1/5	Santa Cruz (Ser 463/Ser 465) (Santa Cruz, CA)	Goat	1:50
Rabbit IgG	Agilent Dako/X0902 (Santa Clara, CA)	-	1:100

Secondary Antibodies			
Antibody	Supplier	Source	Dilution
Alexa Fluor 633 Anti-Goat	Thermo Fisher Scientific (Indianapolis, IN)	Donkey	1: 100
Alexa Fluor 488 Anti-Mouse	Thermo Fisher Scientific (Indianapolis, IN)	Donkey	1: 100
Alexa Fluor 555 Anti-Rabbit	Thermo Fisher Scientific (Indianapolis, IN)	Donkey	1: 100
Alexa Fluor 633 Anti-Chicken	Thermo Fisher Scientific (Indianapolis, IN)	Goat	1: 100