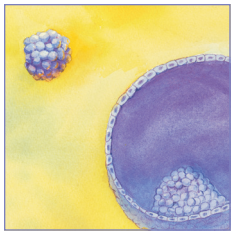
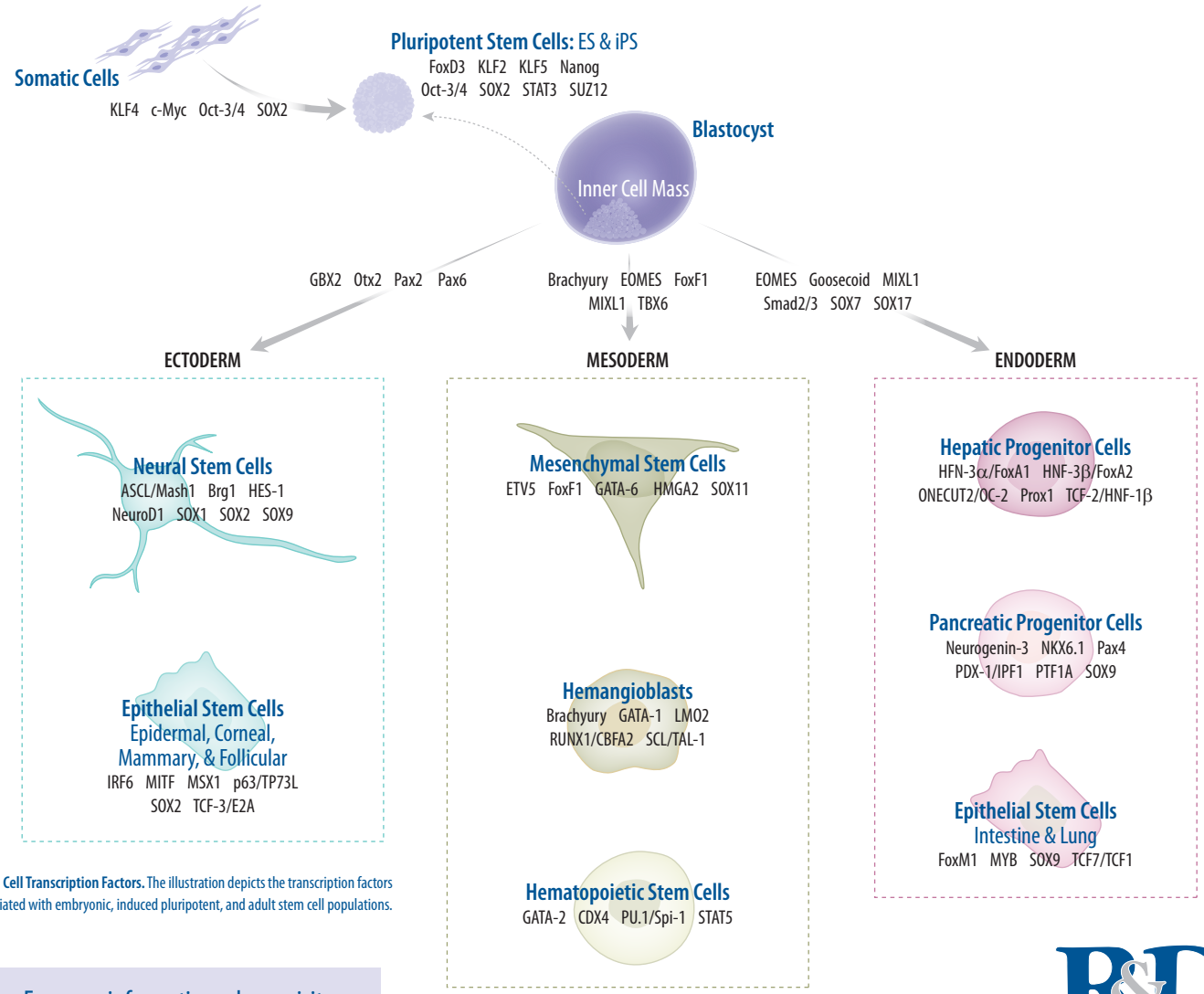


STEM CELL FOCUS: STEM CELL TRANSCRIPTION FACTORS

Stem Cell Transcription Factors

FEATURED DATA: Alkaline Phosphatase · Brachyury · EOMES · c-Myc · Nanog · NKX6.1 · Oct-3/4 · Otx2 · Smad2/3 · SOX2 · SOX17 SSEA-1 · SSEA-4 · TBX6

Stem cells are defined by their capacity for self-renewal and ability to differentiate into a variety of somatic cell types. Cellular programs regarding proliferation, potency, and cell fate determination can be mediated by signal transduction events that modulate transcription factor (TF) expression and/or activation. TFs promote the differentiation of pluripotent embryonic stem (ES) cells derived from the inner cell mass of the blastocyst into stem or progenitor cells of all three vertebrate germ layers: ectoderm, mesoderm, and endoderm. In addition, the expression of specific TFs is sufficient to reprogram somatic cells back to a pluripotent state. Induced pluripotent stem (iPS) cells, like ES cells, give rise to adult stem cells such as neural and epithelial stem cells. Adult stem cells function to replenish cells of the tissue in which they are found. To facilitate stem cell research, we have developed transcription factor-related tools for the identification, expansion, differentiation, and verification of pluripotent and adult stem cells.



Stem Cell Transcription Factors. The illustration depicts the transcription factors associated with embryonic, induced pluripotent, and adult stem cell populations.

For more information, please visit:
www.RnDSystems.com/SCTF

R&D SYSTEMS®

R&D Systems Products for Stem Cell Transcription Factors

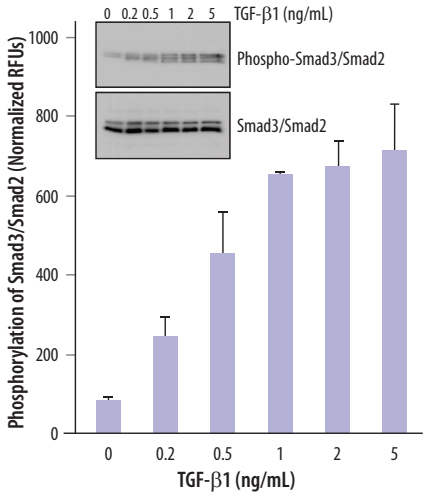
MOLECULE	ANTIBODIES	ELISAs	TRANSCRIPTION FACTOR BINDING & IMMUNOPRECIPITATION ASSAYS
Embryonic & Induced Pluripotent Stem Cell Transcription Factors			
ASCL2/Mash2	H (IHC, WB)		
Brachyury	H (ChIP, FC, IHC, WB) M (ChIP, FC, IHC, WB)		H
EOMES	H (FC, IHC, WB)		
FoxC2	H (IHC, WB) M (IHC)		
FoxD3	H (IHC, WB) M (IHC, WB)		
FoxH1	H (IHC, WB)		
FoxO1/FKHR	H (IHC, WB)		
GATA-2	H (FC, IHC, WB) M (WB)		
GATA-3	H (FC, IHC, WB) M (IHC, WB)		
GBX2	H (WB)		
HES-1	H (IHC, WB)		
HNF-3α/FoxA1	H (IHC, WB)		
c-Jun	H (IHC, WB) M (IHC, WB)		
KLF2	H (IHC, WB) M (IHC, WB) R (IHC, WB)		
KLF4	H (ChIP, FC, IHC, WB) M (ChIP, IHC, WB)		H M
KLF5	H (IHC, WB)		
Max	H (WB)		
MEF2C	H (IHC, WB)		
MTF2	H (IHC)		
c-Myc	H (ChIP, IHC, WB)		H
Nanog	H (ChIP, FC, IHC, WB) M (IHC, WB)		
NFκB1	H (ChIP, WB) M (ChIP, WB)		H
NFκB2	H (ChIP, IHC, WB) M (WB)		H
Oct-3/4	H (ChIP, FC, IHC, IP, WB) M (FC, IHC, WB)		H M
p53*	H (ChIP, FC, IHC, IP, WB) M (ChIP, IP, WB) R (ChIP, IP, WB)	H M	H M
PRDM14	H (IHC, WB)		
Rex-1/ZFP42	H (IHC, WB)		
SALL1	H (IHC, IP, WB)		
SALL4	H (IHC, WB) M (IHC, WB)		
Smad1	H (IHC, WB)		
Smad2	H (ChIP, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad2/3	H (ChIP, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad3	H (ChIP, FC, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad4	H (ChIP, FC, IHC, WB)		H
Smad5	H (IHC, WB) M (WB)		
Smad8	H (IHC, WB)		
Snail	H (ChIP, IHC, WB)		H
SOX1	H (IHC, WB) M (WB)		
SOX2	H (ChIP, FC, IHC, WB) M (FC, IHC, WB)		H
SOX3	H (FC, IHC, WB)		
SOX15	H (IHC, WB)		
SOX17	H (ChIP, FC, IHC, WB)		H
SOX18	H (WB)		

MOLECULE	ANTIBODIES	ELISAs	TRANSCRIPTION FACTOR BINDING & IMMUNOPRECIPITATION ASSAYS
STAT3	H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, FC, IHC, IP, WB)	H M	H M
SUZ12	H (IHC, WB)		
TBX18	H (IHC, WB)		
TCF-3/E2A	H (IHC, WB)		
THAP11	H (IHC, WB) M (IHC, WB)		
UTF1	H (IHC, WB)		
WDR5	H (IHC, WB) M (IHC, WB)		
WT1	H (FC, WB)		
ZNF206	H (IHC, WB)		
ZNF281	H (WB) M (WB)		
Ectoderm Specification Transcription Factors			
GBX2	H (WB)		
Otx2	H (IHC, WB)		
Pax2	H (IHC, WB)		
Pax6	M (IHC) R (IHC) Ch (IHC)		
Endoderm Specification Transcription Factors			
EOMES	H (FC, IHC, WB)		
GATA-4	H (ChIP, IHC, WB)		H
Goosecoid	H (IHC, WB)		
MIXL1	H (IHC)		
Smad2/3	H (ChIP, IHC, WB) M (ChIP, IHC, WB)	H M R	H
SOX7	H (FC, IHC, WB)		M
SOX17	H (ChIP, FC, IHC, WB)		H
Mesoderm Specification Transcription Factors			
Brachyury	H (ChIP, FC, IHC, WB) M (ChIP, FC, IHC, WB)		
EOMES	H (FC, IHC, WB)		
FoxC1	H (WB)		
FoxF1	H (WB) M (WB)		
Goosecoid	H (IHC, WB)		
MIXL1	H (IHC)		
TBX6	H (IHC, WB)		
Epithelial Stem Cell Transcription Factors			
CDX2	H (IHC, WB)		
DNMT1	H (IHC, WB)		
ELF3	H (IHC, WB) M (IHC, WB)		
Ets-1	H (WB) M (WB) R (WB)		
FoxM1	H (IHC, WB)		
FoxN1	M (IHC)		
GATA-6	H (ChIP, IHC, WB)		H
Hairless	H (IHC, WB)		
HNF-4α/NR2A1	H (EMSA, IHC, IP, WB)		
IRF6	H (WB) M (WB)		
MITF	H (IHC, WB)		
Miz-1/ZBTB17	H (WB)		

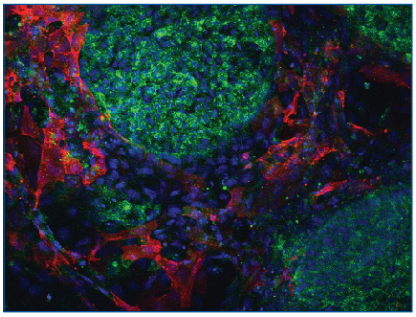
Species Key: H Human M Mouse R Rat Ch Chicken
Application Key: **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **EMSA** Electrophorectic Mobility Shift Assay **FC** Flow Cytometry **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot
* Recombinant Human His6-p53 also available

MOLECULE	ANTIBODIES	ELISAs	TRANSCRIPTION FACTOR BINDING & IMMUNOPRECIPITATION ASSAYS
Epithelial Stem Cell Transcription Factors, continued			
MSX1	H (WB) M (WB)		
MYB	H (WB) M (WB)		
c-Myc	H (ChIP, IHC, WB)		H
Neurogenin-3	H (WB)		
NFATC1	H (WB)		
NKX3.1	H (IHC, WB) M (IHC, WB)		
Nrf2	H (WB) M (WB) R (WB)		
p53*	H (ChIP, FC, IHC, IP, WB) M (ChIP, IP, WB) R (ChIP, IP, WB)	H M	H M
p63/TP73L	H (IHC, WB)		
Pax2	H (IHC, WB)		
Pax3	H (FC, IHC, WB) M (FC, IHC, WB)		
RUNX1/CBFA2	H (IHC, WB) M (WB) R (WB)		
RUNX2/CBFA1	H (ChIP, IHC, WB) M (IHC)		H
RUNX3/CBFA3	H (FC, IHC, WB) M (FC, IHC, WB)		
Smad1	H (IHC, WB)		
Smad2	H (ChIP, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad2/3	H (ChIP, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad4	H (ChIP, FC, IHC, WB)		H
Smad5	H (IHC, WB) M (WB)		
Smad7	H (IHC, WB) M (IHC, WB) R (IHC, WB)		
Smad8	H (IHC, WB)		
Snail	H (ChIP, IHC, WB)		H
SOX2	H (ChIP, FC, IHC, WB) M (FC, IHC, WB)		H M
SOX9	H (IHC, WB)		
STAT3	H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, FC, IHC, IP, WB)	H M	H M
SUZ12	H (IHC, WB)		
TCF-3/E2A	H (IHC, WB)		
TCF7/TCF1	H (IHC, WB)		
Hemangioblast Transcription Factors			
Brachyury	H (ChIP, FC, IHC, WB) M (ChIP, FC, IHC, WB)		H
GATA-1	H (FC, IHC, WB) M (WB)		
LMO2	H (IHC, WB)		
LMO4	H (WB) M (WB)		
RUNX1/CBFA2	H (IHC, WB) M (WB) R (WB)		
SCL/Tal1	H (IHC, WB)		
Hematopoietic Stem Cell Transcription Factors			
AHR	H (IHC, WB) M (FC, IHC, WB)		
CDX4	H (IHC, WB)		
CREB	H (ChIP, IHC, WB) M (WB) R (WB)	H M R	H
DNMT3A	H (IHC, WB) M (WB)		
EGR1	H (IHC, WB)		
FoxO3	H (IHC, WB) M (IHC, WB)		
GATA-1	H (FC, IHC, WB) M (WB)		
GATA-2	H (FC, IHC, WB) M (WB)		
GATA-3	H (FC, IHC, WB) M (IHC, WB)		
Helios	H (FC, IHC, WB)		
HES-1	H (IHC, WB)		

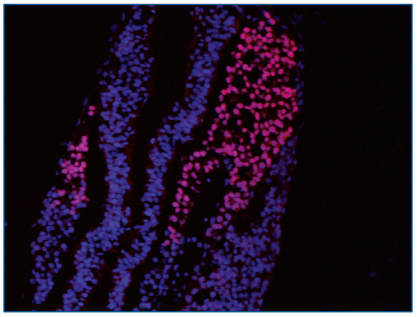
Species Key: H Human M Mouse R Rat Ch Chicken
Application Key: **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **EMSA** Electrophorectic Mobility Shift Assay **FC** Flow Cytometry **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot
* Recombinant Human His6-p53 also available



Concentration-Response of TGF-β1-Induced Smad3/Smad2 Phosphorylation in Mouse Cells. The C2C12 mouse myoblast cell line was untreated or treated with increasing concentrations of Recombinant Human TGF-β1 (Catalog # 100-B). After fixation and permeabilization, Smad3/Smad2 phosphorylation was determined using the Human/Mouse/Rat Phospho-Smad3 (S423/S425)/Smad2 (S465/S467) Cell-Based ELISA (Catalog # KCB3226) and normalized to total Smad3/Smad2 in the same well to compensate for well-to-well differences (bar graph). Detection of Smad3/Smad2 phosphorylation by Western blotting using the antibodies supplied in this kit is shown for comparison (inset).



Verification of Human Induced Pluripotent Stem Cells Using Multi-Color Live Cell Imaging. iPS2 human induced pluripotent stem cells were grown on irradiated mouse embryonic fibroblasts (Catalog # PSC001) and were labeled with antibodies from the Human Pluripotent Stem Cell Live Cell Imaging Kit (Catalog # SC023). The cells were stained with NorthernLights™ (NL)493-conjugated SSEA-4 (green) and NL557-conjugated SSEA-1 (red) and the nuclei were counterstained with HO-33342 (blue).



TBX6 in Embryonic Mouse Mesoderm. T-box Protein 6 (TBX6) was detected in immersion-fixed frozen sections of embryonic mouse mesoderm (E9.5) using a Goat Anti-Human TBX6 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF4744). The tissue was stained using the NorthernLights 557-conjugated Donkey Anti-Goat IgG Secondary Antibody (Catalog # NL001; red) and the nuclei were counterstained with DAPI (blue).

R&D Systems Products for Stem Cell Transcription Factors

MOLECULE	ANTIBODIES	ELISAs	TRANSCRIPTION FACTOR BINDING & IMMUNOPRECIPITATION ASSAYS
Hematopoietic Stem Cell Transcription Factors, continued			
HIF-1α	H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, IP, WB)	H M	H
HMGB1/HMG-1*	H (ChIP, FC, IHC, WB)		H
HMGB3	H (IHC, WB) M (IHC, WB)		
Ikaros	H (ChIP, FC, IHC, WB)		H
c-Jun	H (IHC, WB) M (IHC, WB)		
LMO2	H (IHC, WB)		
LMO4	H (WB) M (WB)		
MafB	H (IHC, WB) R (IHC, WB)		
MEF2C	H (IHC, WB)		
MYB	H (WB) M (WB)		
c-Myc	H (ChIP, IHC, WB)		H
NFATC2	H (WB)		
Nrf2	H (WB) M (WB) R (WB)		
p53*	H (ChIP, FC, IHC, IP, WB) M (ChIP, IP, WB) R (ChIP, IP, WB)	H M	H M
PITX2	H (IHC)		
PRDM16	H (IHC, WB) M (IHC, WB)		
Prox1	H (IHC, WB)		
PU.1/Spi-1	H (FC, IHC, WB) M (WB)		
RUNX1/CBFA2	H (IHC, WB) M (WB) R (WB)		
SALL4	H (IHC, WB) M (IHC, WB)		
SCL/Tal1	H (IHC, WB)		
Smad2	H (ChIP, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad2/3	H (ChIP, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad4	H (ChIP, FC, IHC, WB)		H
Smad7	H (IHC, WB) M (IHC, WB) R (IHC, WB)		
Spi-B	M (FC, IHC)		
STAT3	H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, FC, IHC, IP, WB)	H M	H M
STAT4	H (E, IP, WB) M (E, IP, WB)	H	
STAT5a	H (FC, IHC, IP, WB) M (IHC, IP, WB)		
STAT6	H (FC, IHC, IP, WB) M (FC, IP, WB) R (FC, WB)	H M	
TSC22	M (WB) R (WB)		
Hepatic Progenitor Cell Transcription Factors			
HNF-3α/FoxA1	H (IHC, WB)		
HNF-3β/FoxA2	H (ChIP, IHC, WB)		
ONECUT2/OC-2	H (IHC, WB)		
Prox1	H (IHC, WB)		
TBX3	H (IHC, WB)		
TCF-2/HNF-1β	H (IHC, WB)		
Pancreatic Progenitor Cell Transcription Factors			
Neurogenin-3	H (WB)		
NKX6.1	H (IHC, WB) M (IHC, WB)		

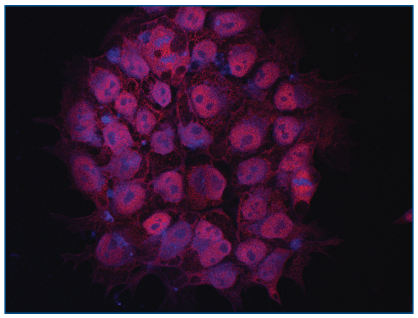
MOLECULE	ANTIBODIES	ELISAs	TRANSCRIPTION FACTOR BINDING & IMMUNOPRECIPITATION ASSAYS
Pax4	H (IHC, WB)		
Pax6	M (IHC) R (IHC) Ch (IHC)		
PDX-1/IPF1	H (FC, IHC, WB) M (FC, IHC, WB) R (IHC, WB)		
PTF1A	H (IHC, WB)		
SOX9	H (IHC, WB)		
Mesenchymal Stem Cell Transcription Factors			
EBF-1	H (WB) M (WB)		
EBF-2	H (IHC, WB) M (IHC, WB)		
EBF-3	H (WB) M (WB)		
ETV5	H (IHC)		
FoxC2	H (IHC, WB) M (IHC)		
FoxF1	H (WB) M (WB)		
GATA-4	H (ChIP, IHC, WB)		H
GATA-6	H (ChIP, IHC, WB)		H
HMGA2	H (IHC, WB) M (IHC, WB)		
c-Jun	H (IHC, WB) M (IHC, WB)		
MYF-5	H (IHC)		
Myocardin	H (WB) M (WB)		
MyoD	H (IHC)		
Myogenin	H (FC, IHC, WB) M (FC, IHC)		
NFATC2	H (WB)		
p53*	H (ChIP, FC, IHC, IP, WB) M (ChIP, IP, WB) R (ChIP, IP, WB)	H M	H M
Pax3	H (FC, IHC, WB) M (FC, IHC, WB)		
PDX-1/IPF1	H (FC, IHC, WB) M (FC, IHC, WB) R (IHC, WB)		
PLZF	H (FC, IHC, WB)		
PRDM16	H (IHC, WB) M (IHC, WB)		
RUNX2/CBFA1	H (ChIP, IHC, WB) M (IHC)		H
Smad1	H (IHC, WB)		
Smad3	H (ChIP, FC, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad4	H (ChIP, FC, IHC, WB)		H
Smad5	H (IHC, WB) M (WB)		
Smad8	H (IHC, WB)		
Smad9	H (IHC) M (IHC)		
Snail	H (ChIP, IHC, WB)		H
SOX2	H (ChIP, FC, IHC, WB) M (FC, IHC, WB)		H M
SOX9	H (IHC, WB)		
SOX11	H (IHC, WB)		
STAT1	H (FC, IHC, IP, WB) M (FC, IP, WB)	H	H M
STAT3	H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, FC, IHC, IP, WB)	H M	H M
TBX18	H (IHC, WB)		
Twist-1	H (FC, IHC)		
Twist-2	H (IHC)		

Species Key: H Human M Mouse R Rat Ch Chicken
Application Key: **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **EMSA** Electrophorectic Mobility Shift Assay **FC** Flow Cytometry **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot
* Recombinant Human HMGB1/HMG-1 and Recombinant Human His6-p53 also available

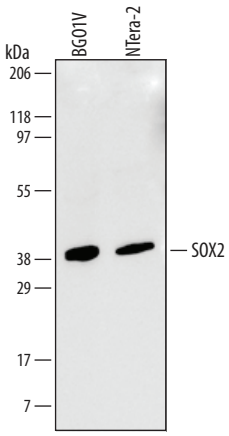
MOLECULE	ANTIBODIES	ELISAs	TRANSCRIPTION FACTOR BINDING & IMMUNOPRECIPITATION ASSAYS
Neural Stem Cell Transcription Factors			
ASCL1/Mash1	M (IHC, WB)		
ATF2	H (IHC, WB) M (WB) R (IHC, WB)		
Brg1	H (IHC, WB)		
CREB	H (ChIP, IHC, WB) M (WB) R (WB)	H M R	H
CSL	H (IHC, WB)		
EMX2	H (WB) M (WB)		
FosB/G0S3	H (IHC, WB) M (WB)		
Fox03	H (IHC, WB) M (IHC, WB)		
GLI-1	H (ChIP, IHC, WB) M (IHC, WB)		H
GLI-2	H (ChIP, IHC, WB) M (IHC, WB)		H
HES-1	H (IHC, WB)		
HOXB1	H (IHC)		
c-Jun	H (IHC, WB) M (IHC, WB)	H M R	
KLF4	H (ChIP, FC, IHC, WB) M (ChIP, IHC, WB)		H
MCM2	H (IHC, WB) M (IHC, WB)		
MEF2C	H (IHC, WB)		
MSX1	H (WB) M (WB)		
NeuroD1	H (IHC, WB) M (IHC, WB)		
NeuroD2	H (WB) M (WB)		
Neurogenin-1	H (WB)		
Neurogenin-2	H (IHC) R (IHC)		
NKX6.1	H (IHC, WB) M (IHC, WB)		
Olig 1, 2, 3	H (FC, IHC)		

MOLECULE	ANTIBODIES	ELISAs	TRANSCRIPTION FACTOR BINDING & IMMUNOPRECIPITATION ASSAYS
Olig1	H (IHC, WB) M (IHC, WB)		
Olig2	H (ChIP, IHC, WB)		H
Olig3	H (IHC, WB) M (IHC, WB)		
p53*	H (ChIP, FC, IHC, IP, WB) M (ChIP, IP, WB) R (ChIP, IP, WB)	H M	H M
Pax3	H (FC, IHC, WB) M (FC, IHC, WB)		
Pax6	M (IHC) R (IHC) Ch (IHC)		
PRDM16	H (IHC, WB) M (IHC, WB)		
Prox1	H (IHC, WB)		
RCOR1/CoREST	H (IHC, WB) M (WB)		
Smad3	H (ChIP, FC, IHC, WB) M (ChIP, IHC, WB)	H M R	H
Smad4	H (ChIP, FC, IHC, WB)		H
Smad7	H (IHC, WB) M (IHC, WB) R (IHC, WB)		
Snail	H (ChIP, IHC, WB)		H
SOX1	H (IHC, WB) M (WB)		
SOX2	H (ChIP, FC, IHC, WB) M (FC, IHC, WB)		H M
SOX3	H (FC, IHC, WB)		
SOX5	H (WB)		
SOX9	H (IHC, WB)		
STAT3	H (ChIP, FC, IHC, IP, WB) M (ChIP, FC, IHC, IP, WB) R (ChIP, FC, IHC, IP, WB)	H M	H M
TCF-3/E2A	H (IHC, WB)		
TCF-12/HTF4	H (IHC, WB)		
ZIC1	H (IHC, WB) M (IHC, WB)		
ZIC3	H (IHC, WB) M (IHC, WB)		

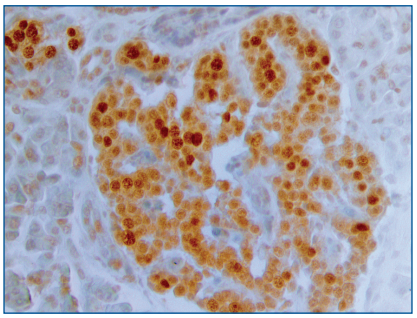
Species Key: H Human M Mouse R Rat Ch Chicken
Application Key: **ChIP** Chromatin Immunoprecipitation **ELISA** ELISA Capture and/or Detection **EMSA** Electrophorectic Mobility Shift Assay **FC** Flow Cytometry **IHC** Immunohistochemistry **IP** Immunoprecipitation **WB** Western blot
* Recombinant Human His6-p53 also available



c-Myc in BG01V Human Embryonic Stem Cells. c-Myc was detected in immersion-fixed BG01V human embryonic stem cells using a Goat Anti-Human c-Myc Antigen Affinity-purified Polyclonal Antibody (Catalog # AF3696). The cells were stained using the NorthernLights 557-conjugated Donkey Anti-Goat IgG Secondary Antibody (Catalog # NL001; red) and the nuclei were counterstained with DAPI (blue).



Detection of Human SOX2 by Western Blot. Lysates of BG01V human embryonic stem cells and NTera2 human testicular embryonic carcinoma cells were immunoblotted using a Goat Anti-Human SOX2 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF2018) followed by a HRP-conjugated Chicken Anti-Goat IgG Secondary Antibody (Catalog # HAF019). SOX2 was detected at approximately 40 kDa (as indicated).



NKX6.1 in Human Pancreas. NK homeobox factor 6.1 (NKX6.1) was detected in immersion-fixed paraffin-embedded sections of human pancreas using a Goat Anti-Human/Mouse NKX6.1 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF5857). The tissue was stained using the Anti-Goat HRP-DAB Cell & Tissue Staining Kit (Catalog # CTS008; brown) and counterstained with hematoxylin (blue).

Pluripotent Stem Cells: Feeder Cells, Media, & Verification Kits

Stem/Progenitor Cell Growth Substrate

StemXVivo™ Culture Matrix is a defined, proprietary mixture of recombinant adhesion molecules designed for the culture of stem/progenitor cells. It can be used as a substitute for basement membrane extract or as a feeder layer. Enhanced lot-to-lot consistency reduces variability in the attachment and growth of stem/progenitor cell populations versus undefined culture matrices.

PRODUCT	DESCRIPTION	CATALOG #	SIZE
StemXVivo Culture Matrix	A defined proprietary mixture of recombinant human adhesion molecules for the culture of stem/progenitor cells. Supplied as a 100X concentrate in PBS.	CCM013	1 mL

Feeder Cells

Mouse embryonic fibroblasts (iMEFs) are isolated from pathogen-free E13.5 embryos and are mitotically inactivated by irradiation rather than by use of pharmacological inhibitors, thus eliminating possible exposure of stem cells to toxic agents. Each lot of iMEF feeders is tested for the absence of mycoplasma and the ability to maintain the expression of pluripotency markers in human embryonic and induced pluripotent stem cells.

PRODUCT	DESCRIPTION	CATALOG #	SIZE
Irradiated Mouse Embryonic Fibroblasts	Tested for their ability to support the expansion of BG01V human embryonic stem cells in the undifferentiated state based on the expression of Oct-3/4 and SSEA-4. Each vial contains 6 x 10^6 cells.	PSC001	5 Vials

Feeder Cell Conditioned Media

Human embryonic and induced pluripotent stem cells can be maintained and expanded using mouse feeder cell conditioned media, which is tested for the ability to support the growth of cells expressing markers of pluripotency.

PRODUCT	DESCRIPTION	CATALOG #	SIZE
Mouse Embryonic Fibroblast Conditioned Media	Serum-free media tested for its ability to support Oct-3/4$^+$, SSEA-4$^+$ growth of BG01V human embryonic stem cells *in vitro*.	AR005	100 mL

Human Pluripotent Stem Cell Array

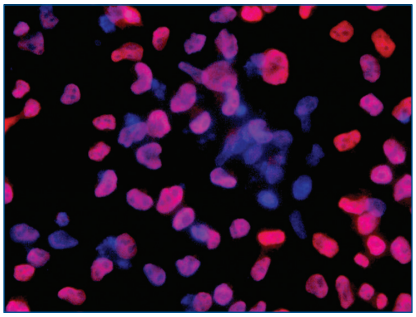
R&D Systems Proteome Profiler™ Arrays are screening tools that simultaneously detect the relative levels of multiple proteins in each sample. This array contains eight nitrocellulose membranes spotted with 15 different stem cell marker antibodies.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Human Pluripotent Stem Cell Array Kit	Eight membranes spotted in duplicate with antibodies against E-Cadherin, α-Fetoprotein, GATA-4, Goosecoid, HCG, HNF-3β/FoxA2, Nanog, Oct-3/4, Otx2, PDX-1/IPF1, Snail, SOX2, SOX17, TP63/TP73L, and VEGF R2/KDR/Flk-1.	ARY010	1 Kit

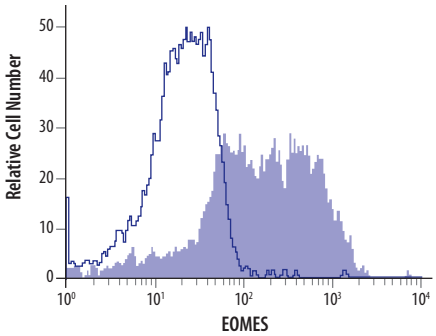
Pluripotent Cell-derived Endoderm Differentiation Kit

Specially formulated media supplements and growth factors, which can be used to differentiate human pluripotent stem cells into definitive endoderm under serum-free conditions.

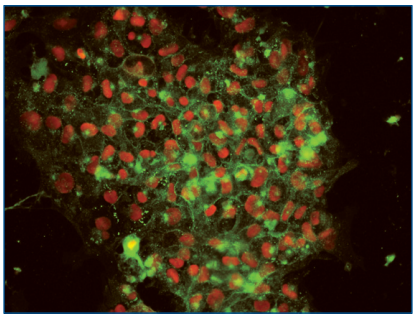
PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Human Pluripotent Cell-derived Endoderm Differentiation Kit	Endoderm Base Media Supplement, Recombinant Human Activin A, FGF basic, and Wnt-3a. Sufficient materials to differentiate 2.8 x 10^7 human pluripotent stem cells into definitive endoderm.	SC019	1 Kit



Nanog in BG01V Human Embryonic Stem Cells. Nanog was detected in immersion-fixed BG01V human embryonic stem cells using a Goat Anti-Human Nanog Antigen Affinity-purified Polyclonal Antibody (Catalog # AF1997). The cells were stained using the NorthernLights 557-conjugated Donkey Anti-Goat IgG Secondary Antibody (Catalog # NL001; red) and the nuclei were counterstained with DAPI (blue).



Detection of EOMES in Differentiated BG01V Human Embryonic Stem Cells by Flow Cytometry. BG01V human embryonic stem cells differentiated to mesendoderm were stained with a Mouse Anti-Human EOMES Monoclonal Antibody (Catalog # MAB6166; filled histogram) or a Mouse IgG_{2B} Isotype Control Antibody (Catalog # MAB0041; open histogram), followed by an APC-conjugated Anti-Mouse IgG Secondary Antibody (Catalog # F0101B).



Alkaline Phosphatase and Oct-3/4 in BG01V Human Embryonic Stem Cells. Alkaline Phosphatase/ALPL and Oct-3/4 were detected in immersion-fixed BG01V human embryonic stem cells using a Mouse Anti-Human/Mouse/Rat Alkaline Phosphatase/ALPL Monoclonal Antibody (Catalog # MAB1448) and a Goat Anti-Human Oct-3/4 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF1759). The cells were stained for Alkaline Phosphatase/ALPL using the NorthernLights 557-conjugated Donkey Anti-Mouse IgG Secondary Antibody (Catalog # NL007; green) and stained for Oct-3/4 using the NorthernLights 637-conjugated Donkey Anti-Goat IgG Secondary Antibody (Catalog # NL002; red).

Multi-Color Flow Cytometry Kit

Human or mouse embryonic stem cell marker expression can be verified simultaneously using four fluorochrome-conjugated antibodies.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Human/Mouse Embryonic Stem Cell 4-Color Flow Cytometry Kit	Conjugated antibodies to SSEA-1-PerCP (Clone MC-480), SSEA-4-Fluorescein (Clone MC-813-70), Oct-3/4-APC (Clone 240408), and SOX2-PE (Clone 245610).	FMC001	25 Tests

Kit also contains appropriate staining buffers and specific isotype controls.

Live Pluripotent Stem Cell Imaging Kit

Three azide-free stem cell marker antibodies conjugated to NorthernLights (NL) fluorochromes can be used for quick, single-step, immunocytochemical staining of live human pluripotent stem cells. Following positive colony selection and plating of pluripotent cells, the cells continue in culture without adverse effects on cell proliferation or stemness.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Human Pluripotent Stem Cell Live Cell Imaging Kit	NL557-conjugated Mouse Anti-Human SSEA-1, NL493-conjugated Mouse Anti-Human SSEA-4, and NL557-conjugated Mouse Anti-Human TRA-1-60(R).	SC023	1 Kit

Functiontional Identification Kit

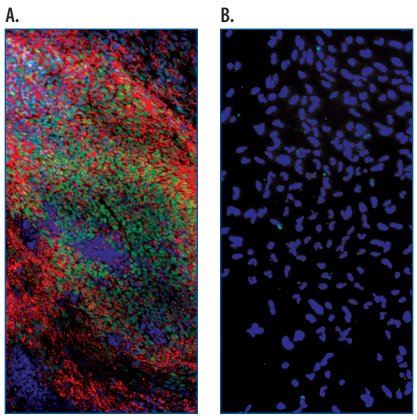
Media supplements and growth factors can be used to verify the ability of human pluripotent stem cells to differentiate into ectoderm, mesoderm, and endoderm. The kit also includes antibodies to characterize the three cell types and confirm the multipotency status of the starting stem cells.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Human Pluripotent Stem Cell Functional Identification Kit	Differentiation Base Media Supplement; Endoderm, Ectoderm, and Mesoderm Differentiation Supplements; Goat Anti-Human Brachyury, Goat Anti-Human Otx2, and Goat Anti-Human SOX17 Antibodies.	SC027	1 Kit

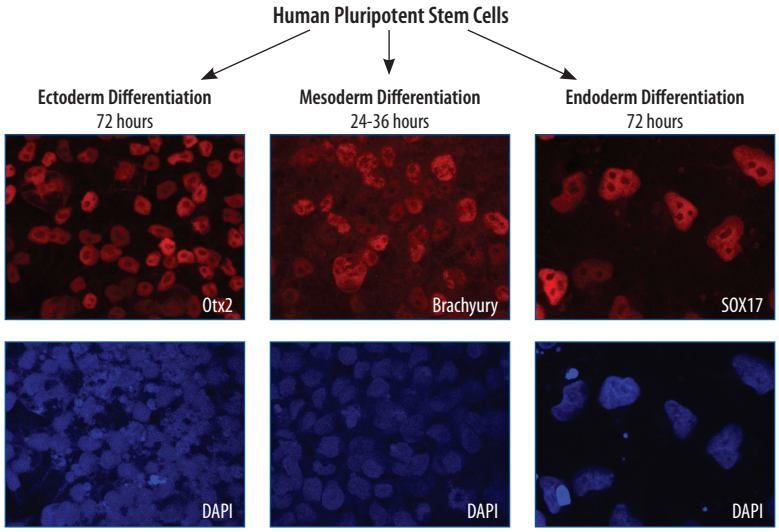
Embryonic Stem Cell Marker Panels

Antibodies for assessing the undifferentiated/pluripotent status of human embryonic stem cells and human, mouse, and rat pluripotent stem cells.

PRODUCT	KIT CONTENTS	CATALOG #	SIZE
Human Embryonic Stem Cell Marker Antibody Panel	25 µg each of antibodies to Alkaline Phosphatase, Nanog, Oct-3/4, SSEA-1, and SSEA-4.	SC008	1 Kit
Human Embryonic Stem Cell Marker Antibody Panel Plus	25 µg each of antibodies to CD9, E-Cadherin, Podocalyxin, Nanog, Oct-3/4, SOX2, SSEA-1, and SSEA-4.	SC009	1 Kit
Human Pluripotent Stem Cell Assessment Primer Pair Panel	Primer pairs for human AFP, Brachyury, DPPA5/ESG1, GAPDH, GATA-4, HNF-3β, Nanog, Nestin, Oct-3/4, Otx2, PDX-1, SOX2, SOX17, TP63/TP73L, and Stella.	SC012	1 Kit
Mouse/Rat Pluripotent Stem Cell Assessment Primer Pair Panel	Primer pairs for mouse/rat AFP, Brachyury, DPPA5/ESG1, GAPDH, GATA-4, HNF-3β, Nanog, Nestin, Oct-3/4, Otx2, PDX-1, SOX2, SOX17, TP63/TP73L, and Stella.	SC015	1Kit
Human Pluripotent Stem Cell 3-Color Immunocytochemistry Kit	NL557-conjugated Goat Anti-Human SOX2, NL637-conjugated Goat Anti-Human Oct-3/4, and NL493-conjugated Goat Anti-Human Nanog.	SC021	1Kit



Embryonic Stem Cells Grown in Mouse Embryonic Fibroblast (MEF)-Conditioned Media Retain Markers of Pluripotency. Human embryonic stem cells were cultured with Recombinant Human FGF basic (Catalog # 233-FB) in the presence (A) or absence (B) of Mouse Embryonic Fibroblast (MEF) Conditioned Media (Catalog # AR005). The cells were stained using a Mouse Anti-Human/Mouse SSEA-4 Monoclonal Antibody (Catalog # MAB1435; red) and a Goat Anti-Human Oct-3/4 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF1759; green). The nuclei were counterstained with DAPI (blue). *Images courtesy of Dr. Frank Soldner, NIH.*



Verification of Human Embryonic Stem Cell Pluripotency. The ability of BG01V human embryonic stem cells to differentiate to ectoderm, mesoderm, and endoderm lineages was verified using the media supplements included in the Human Pluripotent Stem Cell Functional Identification Kit (Catalog # SC027). The kit also contains Goat Anti-Human Polyclonal Otx2 (ectoderm), Goat Anti-Human Polyclonal Brachyury (mesoderm), and Goat Anti-Human Polyclonal SOX17 (endoderm) Antibodies for the confirmation of differentiation status. The cells were stained using the NorthernLights 557-conjugated Donkey Anti-Goat IgG Secondary Antibody (Catalog # NL001; red) and the nuclei were counterstained with DAPI (blue).

R&D Systems, Inc.
614 McKinley Place NE
Minneapolis, MN 55413
TEL: (800) 343-7475
(612) 379-2956
FAX: (612) 656-4400
www.RnDSystems.com

PRSRT STD
U.S. POSTAGE
PAID
R&D SYSTEMS

Change Service Requested

FC_02.12_SCTF

Peer-reviewed References using R&D Systems Stem Cell Transcription Factor-related Products

1. Du, J . *et al.* (2012) HIF-1α deletion partially rescues defects of hematopoietic stem cell quiescence caused by Cited2 deficiency. Blood **119**:2789.

   Sheep Anti-Human/Mouse Cited-2 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF5005)

   Sample: EML C1 mouse hematopoietic stem cell extracts
   Application: Chromatin immunoprecipitation

2. Kaucher, A. *et al.* (2012) NEUROG3 is a critical downstream effector for STAT3-regulated differentiation of mammalian stem and progenitor spermatogonia. Biol. Reprod. Epub ahead of print.

   Goat Anti-Human/Mouse/Rat STAT3 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF1799)

   ExactaChIP™ Chromatin IP Buffer Panel (Catalog # ECP001)

   Sample: Mouse THY1+ germ cell extracts
   Application: Chromatin immunoprecipitation

3. Ball, G. *et al.* (2012) Inhibition of platelet-derived growth factor receptor signaling regulates Oct4 and Nanog expression, cell shape, and mesenchymal stem cell potency. Stem Cells **30**:548.

   Proteome Profiler Human Pluripotent Stem Cell Array Kit (Catalog # ARY010)

   Proteome Profiler Human Phospho-RTK Array Kit (Catalog # ARY001)

   Sample: Human mesenchymal stem cell lysates
   Application: Multi-analyte profiling

4. Wang, C. *et al.* (2011) TGFβ inhibition enhances the generation of hematopoietic progenitors from human ES cell-derived hemogenic endothelial cells using a stepwise strategy. Cell Res. **22**:194.

   PE-conjugated Mouse Anti-Human Brachyury Monoclonal Antibody (Catalog # IC20851P)

   APC-conjugated Mouse Anti-Human VEGF R2/KDR Monoclonal Antibody (Catalog # FAB357A)

   APC-conjugated Mouse Anti-Human Tie-2 Monoclonal Antibody (Catalog # FAB3131A)

   PE-conjugated Mouse Anti-Human Endoglin/CD105 Monoclonal Antibody (Catalog # FAB10971P)

   Sample: Human embryonic and hematopoietic stems cells
   Application: Flow cytometry

5. Kamal, M. *et al.* (2012) REST regulates oncogenic properties of glioblastoma stem cells. Stem Cells **30**:405.

   Mouse Anti-Human/Mouse SOX2 Monoclonal Antibody (Catalog # MAB2018)

   Sample: Human glioblastoma stem cell lysates
   Application: Western blot

6. Pekkanen-Mattila, M. *et al.* (2012) The effect of human and mouse fibroblast feeder cells on cardiac differentiation of human pluripotent stem cells. Stem Cell Int. Article ID 875059.

   Mouse Anti-Human Oct-3/4 Monoclonal Antibody (Catalog # MAB1759)

   Goat Anti-Human Nanog Antigen Affinity-purified Polyclonal Antibody (Catalog # AF1997)

   Sample: Human embryonic and induced pluripotent stem cells
   Application: Immunocytochemistry

7. Wang, C. *et al.* (2012) Hedgehog and notch signaling regulate self-renewal of undifferentiated pleomorphic sarcomas. Cancer Res. **72**:1013.

   Goat Anti-Human GLI-1 Antigen Affinity-purified Polyclonal Antibody (Catalog # AF3324)

   Sample: Human undifferentiated pleomorphic sarcoma tumor tissue
   Application: Immunohistochemistry

8. Chae, H.D. *et al.* (2012) 5-Aminoimidazole-4-carboxyamide ribonucleoside induces G1/S arrest and Nanog downregulation via p53 and enhances erythroid differentiation. Stem Cells **30**:140.

   PE-conjugated Mouse Anti-Human/Mouse SSEA-1 Monoclonal Antibody (Catalog # FAB2155P)

   Sample: Mouse embryonic stem cells
   Application: Flow cytometry

9. Adameyko, I. *et al.* (2012) Sox2 and Mitf cross-regulatory interactions consolidate progenitor and melanocyte lineages in the cranial neural crest. Development **139**:397.

   Goat Anti-Human MITF Antigen Affinity-purified Polyclonal Antibody (Catalog # AF5769)

   Sample: Mouse embryo
   Application: Immunohistochemistry

For more information about
Stem Cell Transcription Factor-related products,
please visit: www.RnDSystems.com/SCTF