

Stem Cell Markers Antibodies to Induced Pluripotent Stem Cells

Induced pluripotent stem cells (iPS cells or iPSCs) are produced from non-pluripotent cells, via programmed expression of specific genes via human intervention. The extent of match between natural pluripotent stem cells and those derived artificially via gene manipulation is still under determination, but congruence exists for a number of signatures such as morphology, chromatin methylation patterns, stem cell markers, telomerase activity, doubling rates, teratoma formation, and embryoid body formation.

Advantages of iPSCs are the possibility to avoid immune rejection by patients since they are produced from the patients' own adult somatic cells, and to circumvent the controversial use of embryos in stem cell research. Disadvantages include the propensity of iPSCs to form tumors.

The genes demonstrated to date to promote iPSC formation have all been associated with cancer by one means or another. Alternative methods to produce iPSCs, including non-genetic methods, as well as to increase efficiency of iPSC formation, are under active research to address significant barriers to safe clinical application in regenerative medicine.

iPS cell generation is crucially dependent on the role of specific genes, with high interest for targets identified by current research as follows:

Oct3/4

Oct3/4, also known as POU5F1, is a transcription factor essential to maintaining pluripotency. The presence of Oct3/4 permits pluripotency and differentiation potential of embryonic stem cells, while its absence blocks such potential.

Sox family

The Sox family of transcription factors is also associated with maintaining pluripotency. Sox1 and Sox2 yield iPS cells with similar efficiency. Sox3, Sox15, and Sox18 also generate iPS cells, although with relative decreased efficiency.

Klf family

The Klf (Krueppel-like factor) family of transcription factors have been scrutinized extensively for their roles in cell proliferation, differentiation and survival, particularly with respect to cancer. Klf4 was initially identified for its role in the artificial generation of mouse iPS cells – further research has not proven the necessity of Klf genes in the generation of human iPS cells. Klf2 shows similar efficiency in iPS production, while family members Klf1 and Klf5 produce iPS with greatly reduced efficiency.

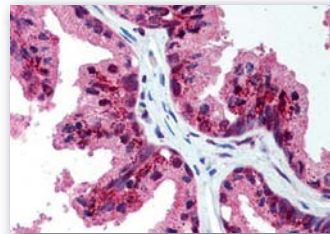


Fig. 1: Formalin-fixed paraffin-embedded (FFPE) human prostate stained with Oct3/4 antibody Cat.-No. AP07188PU-N

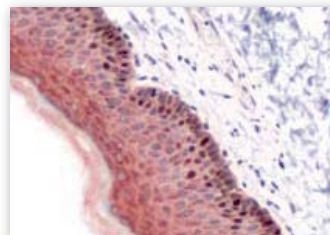


Fig. 2: Human skin (FFPE) stained with anti-Sox2 antibody Cat.-No. AP15787PU-S

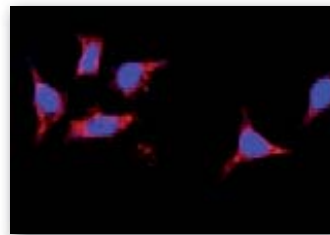


Fig. 3: Immunofluorescence analysis of Sox2 monoclonal antibody Cat.-No. AM11050PU-N in HeLa cells at 25µg/ml followed by Alexa-Fluor-546-conjugated secondary antibody (orange; blue counterstaining with DAPI)

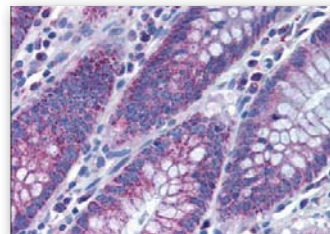


Fig. 4: Colon (FFPE) stained with Klf4 antibody Cat.-No. AP08292PU-N

Myc family

The Myc family of genes (c-Myc, n-Myc, and l-Myc) are protooncogenes strongly tied to cancer. C-Myc is a factor identified in the generation of mouse iPS cells; like Klf family members, research is not proven the requirement for Myc genes in the generation of human iPS cells. A quarter of mice transplanted with c-Myc-induced iPS cells develop lethal teratomas, which has spurred research into methods to avoid the use of Myc genes in production of induced pluripotent stem cells.

Nanog

In embryonic stem cells, Nanog is necessary, along with Oct-3/4 and Sox2, to promote pluripotency. Research has shown it is possible to manufacture iPS cells with Nanog as a contributing factor, while other research has observed that Nanog is unnecessary for induction.

Lin28

Lin28 is an mRNA binding protein expressed in embryonic stem cells and embryonic carcinoma cells associated with differentiation and proliferation. It has been demonstrated as a factor in iPSC generation, although its presence is not necessary.

The table below summarizes Acris Antibodies induced pluripotent stem cell antibodies. Refer to www.acris-antibodies.com and our other FocusOn antibody panel for a comprehensive listing of our products for stem cells research:

- FocusOn 104: Primordial Germ Cells and Ectoderm
- FocusOn 105: Neural Stem Cells
- FocusOn 106: Embryonic Stem Cells
- FocusOn 053: Mesenchymal Stem Cells
- FocusOn 054: Hematopoietic Stem Cells
- FocusOn 055: Induced Pluripotency (iPS)

Selected Acris Antibodies Panel to Induced Pluripotent Stem Cell Markers

Name	Property	Host/Isotype	Clone	Reactivity	Application	Format	Catalog-No.
Klf4	-	Mouse IgG1	56CT5.1.6	Hu	E, IF, WB	Purified	AM11052PU-N
	-	Mouse IgG1	AT4E6	Hu	E, P, WB	Purified	AM09057PU-S
	-	Rabbit IgG	-	Hu, Ms, Rt	E, WB	Aff-Purified	AP30482PU-N
	1-50	Rabbit IgG	-	Bov, Hu, Mky, Ms, Rt	P, WB	Aff-Purified	AP08292PU-N
	N-term	Goat	-	Bov, Hu, Ms, Rt	WB	Aff-Purified	AP16034PU-N
Lin28	-	Mouse IgG1	55CT58.12.1	Hu	E, P, WB	Purified	AM11048PU-N
	100-150	Rabbit	-	Bov, Can, Hu, Ms, Por, Mky, Rt	P, WB	Purified	AP21962PU-N
	-	Rabbit IgG	-	Hu	E, P, WB	Purified	AP30509PU-N
c-Myc*	-	Mouse IgG1	CT14.G4	Hu	C, F, IP, P, WB	Purified	SM1410P
	-	Mouse IgG1	33	Av, Hu, Ms, Rt	C, IP, WB	Purified	AM05253PU-N
	-	Rabbit	-	Hu, Ms, Zf	E, P, WB	Aff-Purified	AP11848PU-N
	-	Rabbit	-	Hu, Ms, Rt	WB	Aff-Purified	AP02578PU-S
Nanog	-	Mouse IgG2a	5A10	Hu	E, P, WB	Purified	AM09023PU-N
	-	Mouse IgG1	60CT70.5.12	Hu	E, WB	Ascites	AM11049SU-N
	N-term	Rabbit	-	Hu	E, WB	Purified	AP11497PU-N
	Center	Rabbit	-	Hu	E, IF, P, WB	Purified	AP11498PU-N
	Internal	Goat	-	Can, Hu	E, IF, WB	Aff-Purified	AP16396PU-N
Oct3/4	-	Mouse IgG2b	NRG1.1	Hu	P	Purified	AM03173PU-S
	-	Rabbit	-	Hu	P	Purified	AP15694PU-S
	N-term	Rabbit	-	Hu	P, IF, WB	Purified	AP11910PU-N
	-	Rabbit	-	Hu	P, WB	Aff-Purified	AP07188PU-N
	-	Rabbit	-	Bov, Hu, Ms, Por, Rt	IP, P, WB	Aff-Purified	AP00249PU-N
	-	Rabbit IgG	-	Eq, Hu, Mky, Ms	E, WB	Aff-Purified	AP09402PU-N
	-	Rabbit IgG	-	Hu, Ms, Rt	E, P, WB	Aff-Purified	AP30685PU-N
	230-244	Rabbit	-	Bov, Can, Hu, Mky, Ms, Rt	WB	Purified	AP21525PU-N
Sox2	N-term	Rabbit IgG	SP76	Hu	P	Purified	AM09112PU-N
	-	Mouse IgG1	57CT23.3.4	Hu	E, IF, P, WB	Purified	AM11050PU-N
	N-term	Rabbit IgG	-	Hu	P, WB	Aff-Purified	AP08354PU-N
	N-term	Rabbit	-	Hu, Ms, Zf	E, IF, F, P, WB	Purified	AP11920PU-N
	Center	Rabbit	-	Hu	E, WB	Aff-Purified	AP11919PU-N
	N-term	Rabbit	-	Hu	P	Purified	AP15787PU-S
	100-150	Rabbit	-	Chk, Fe, Hu, Mky, Ms, Op, Por, Rt, Xen, Zf	WB	Aff-Purified	AP22241PU-N
	50-100	Rabbit	-	Hu, Ms	P	Purified	AP22240PU-N

* Please refer to our homepage to antibodies for different phosphorylation c-Myc antibodies

Av: Bird, Bov: Bovine, Can: Canine, Eq: Horse, Fe: Cat, Hu: Human, Mky: Monkey, Ms: Mouse, Op: Opossum, Por: Pig, Rt: Rat, Xen: Xenopus, Zf: Zebrafish

C: Immunohistochemistry on frozen sections, E: ELISA, F: Flow cytometry, IF: Immunofluorescence, IP: Immunoprecipitation, P: Immunohistochemistry on formalin-fixed, paraffin-embedded tissue sections, WB: Western blot