

Antibodies for stem cell research

Pluripotent stem cell markers

Key markers expressed in pluripotent stem cells		
Target	Antibody Cat. No. (clone number)	
OCT4/POU5F1	MA1-104 (9B7), MA1-104D488, MA1-104HRP	
SSEA4	MA1-021 (MC-813-70), MA1-021D488, MA1-021D550, MA1-021D650, MA1-021PE	
TRA-1-60	411000 (cl.A), MA1-023 (tra-1-60), MA1-023D550, MA1-023D650, MA1-023HRP, MA1-023PE	
TRA-1-81	411100 (cl.26), MA1-024 (tra-1-81), MA1-024D488, MA1-024D550, MA1-024D650, MA1-024HRP, MA1024PE	
NANOG	MA1-017 (23D2-3C6), MA1-017D488, MA1-017D550, MA1-017D650, MA1-017HRP, PA1-097	
SOX2	48-1400 (20G5), MA1-014 (20G5), MA1-014D488, MA1-014D550, MA1-014D650, MA1-014HRP, PA1-094	
LIN28A	MA1-016 (14E6-4E6), MA1-016D488, MA1-016D550, MA1-016D650, MA1-016HRP, PA1-096	
SSEA1	MA1-022 (MC-480), MA1-022D488, MA1-022D550, MA1-022D650, MA1-022PE, 41-1200, MH-CD1501 (VIMC6), MHCD1504, MHCD1528, MHCD1530	
SSEA3	MA1-020 (MC-631), MA1-020D488, MA1-020D650, MA1-020PE	
c-Myc	MA1-980 (9E10), 700648 (27H46L35), 13-2500 (9E10), 13-2511 (9E10), A21280 (289-19510), A21281, AHO00582 (9E11)	
Rex1	701159 (14H16L9), 710190 (14HCLC)	
KLF4	PA1-095	
DNMT3B	PA1-884	
C17orf96	703052	
PRMT5	703704	
VGLL4	703012	
LATS2	703621	
ESRRB	703237	
SAV1	703002	
GLI2	702013	
SOX9	702016	

Ectoderm, mesoderm, and endoderm markers

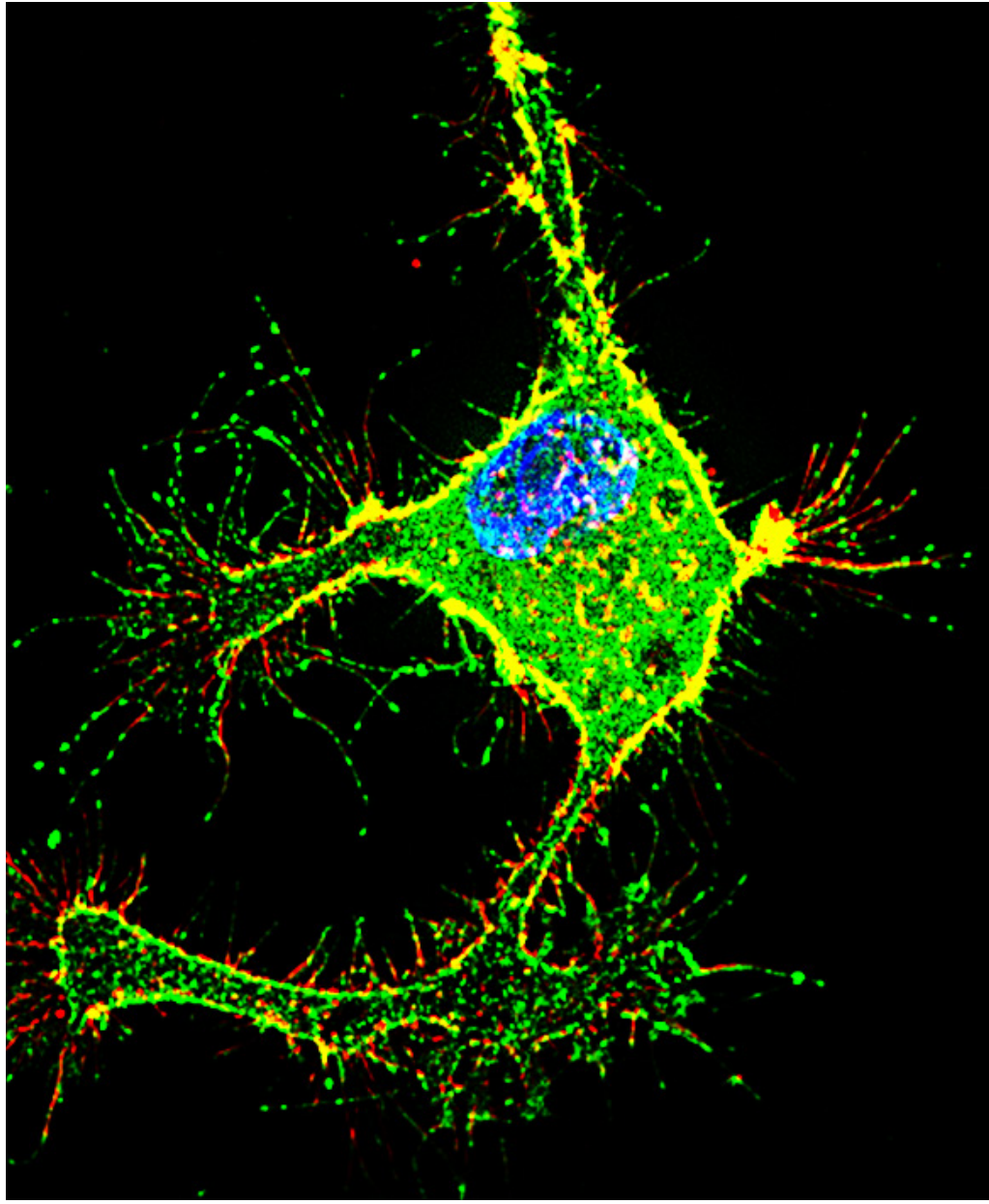
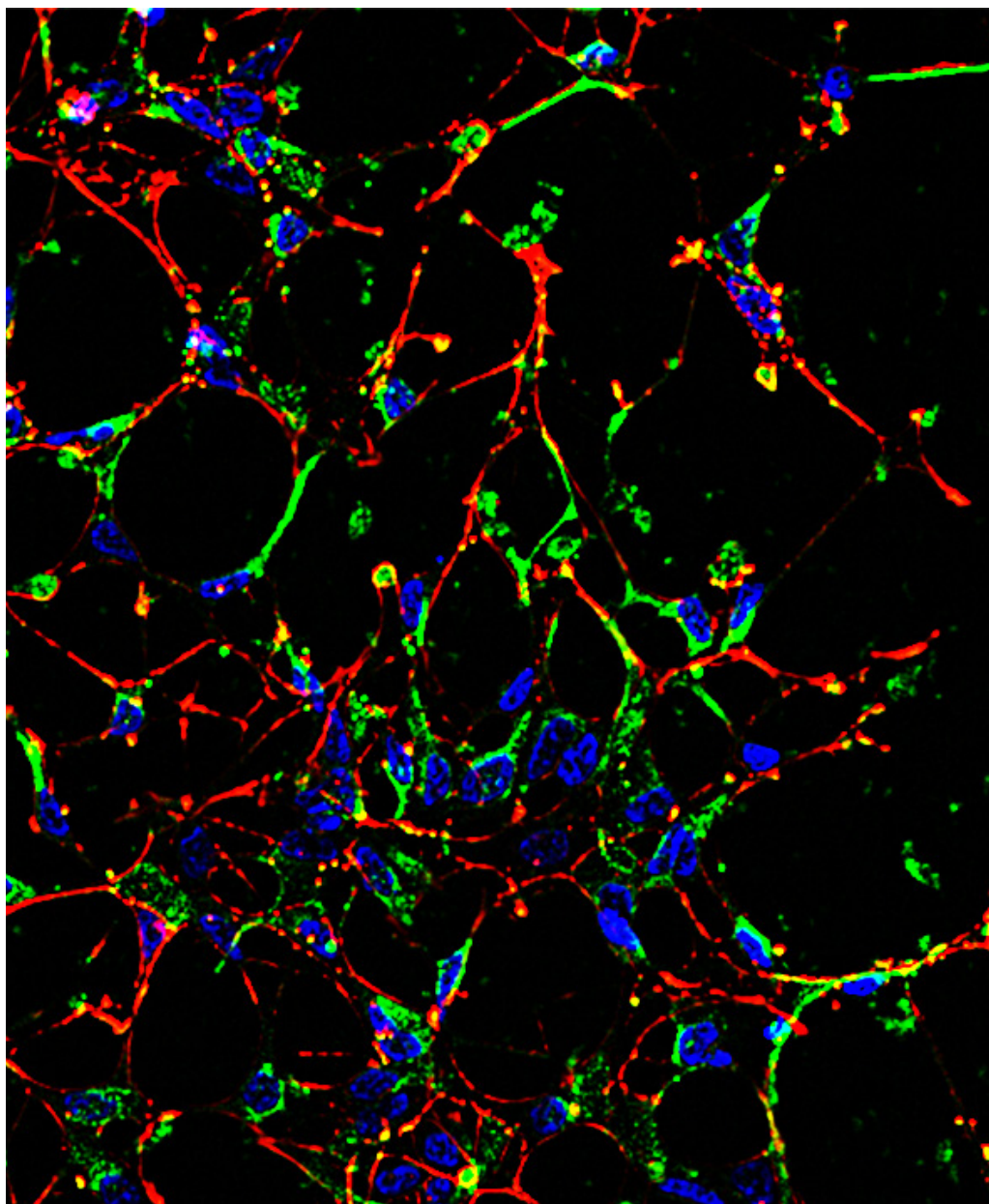
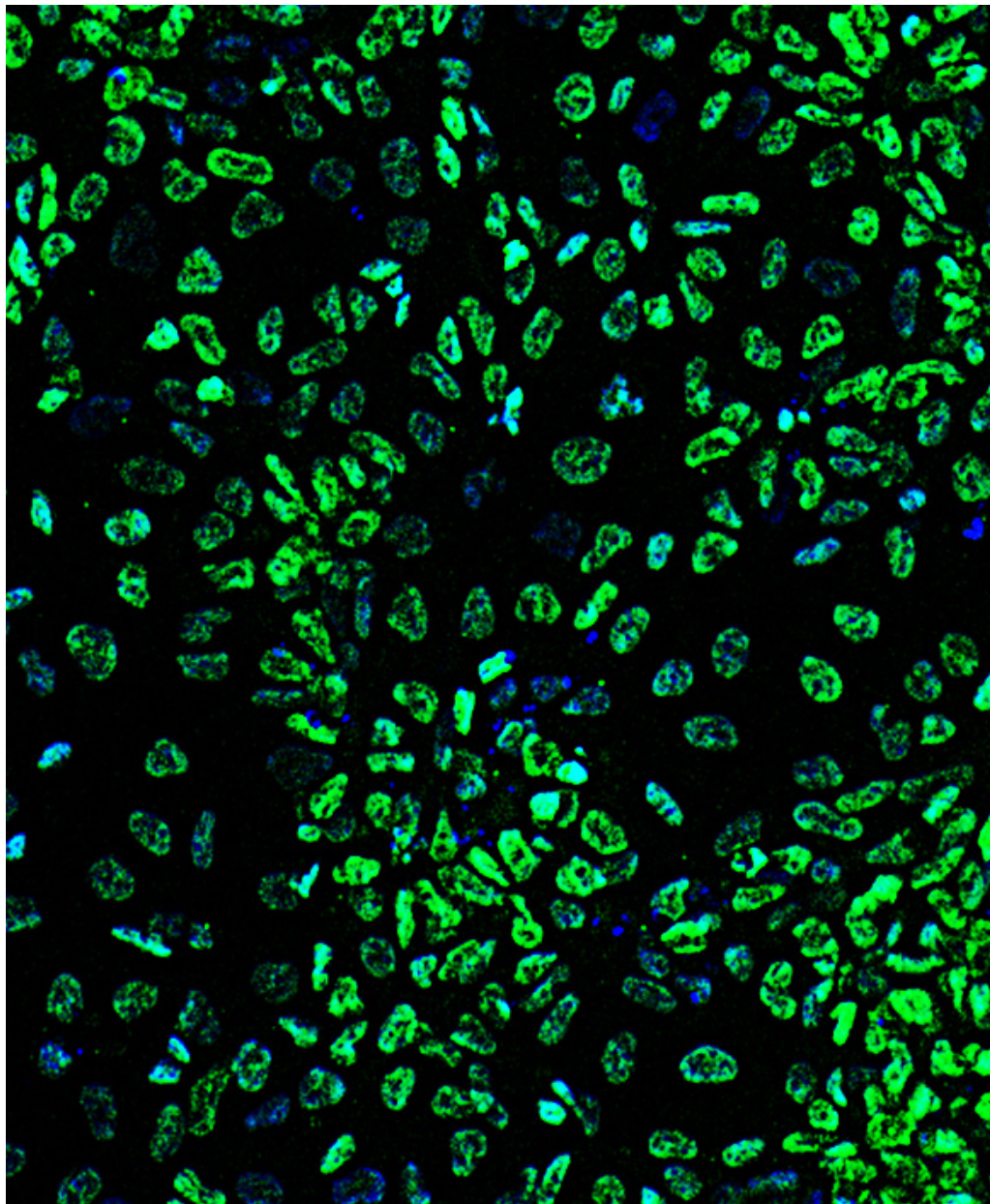
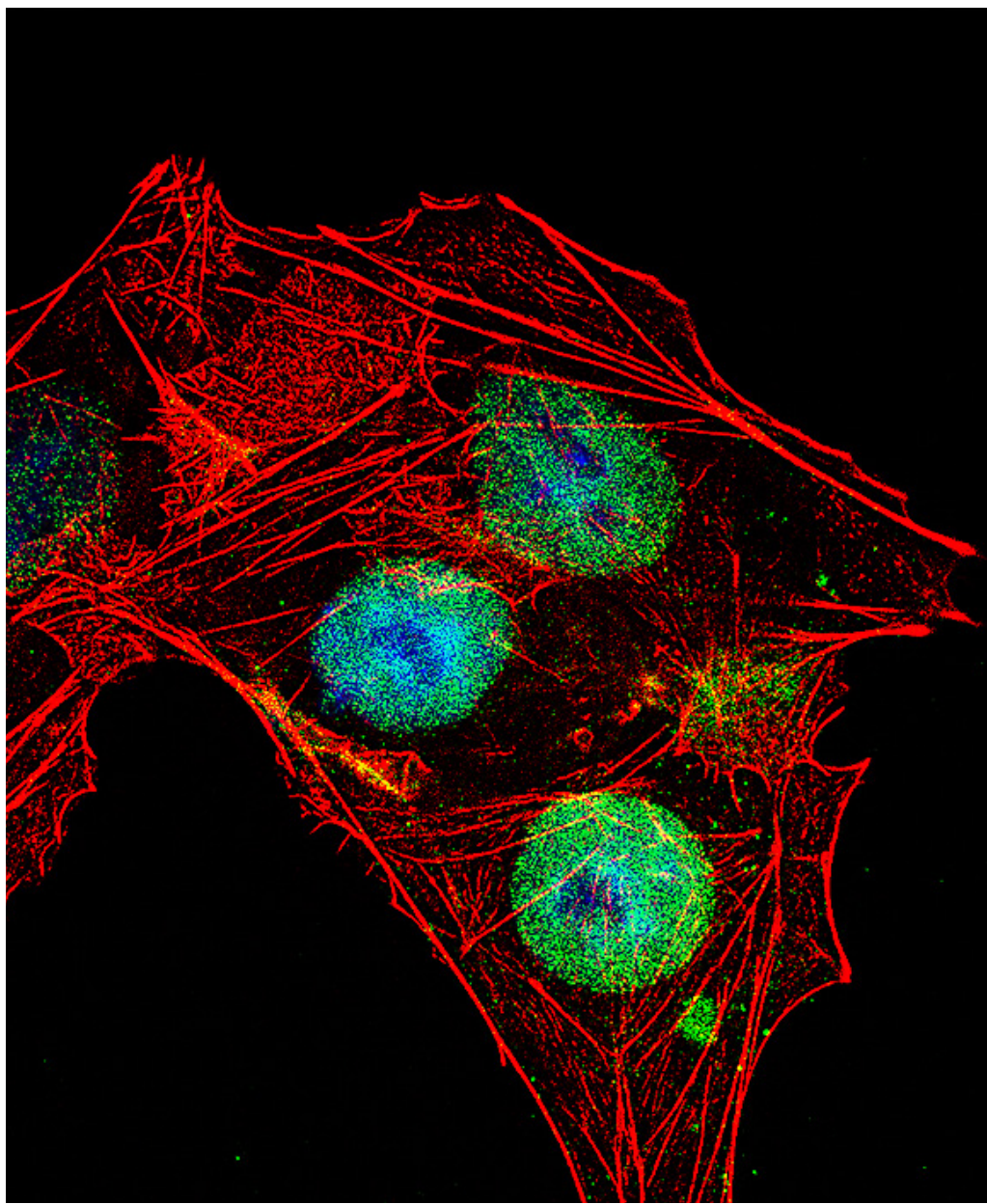
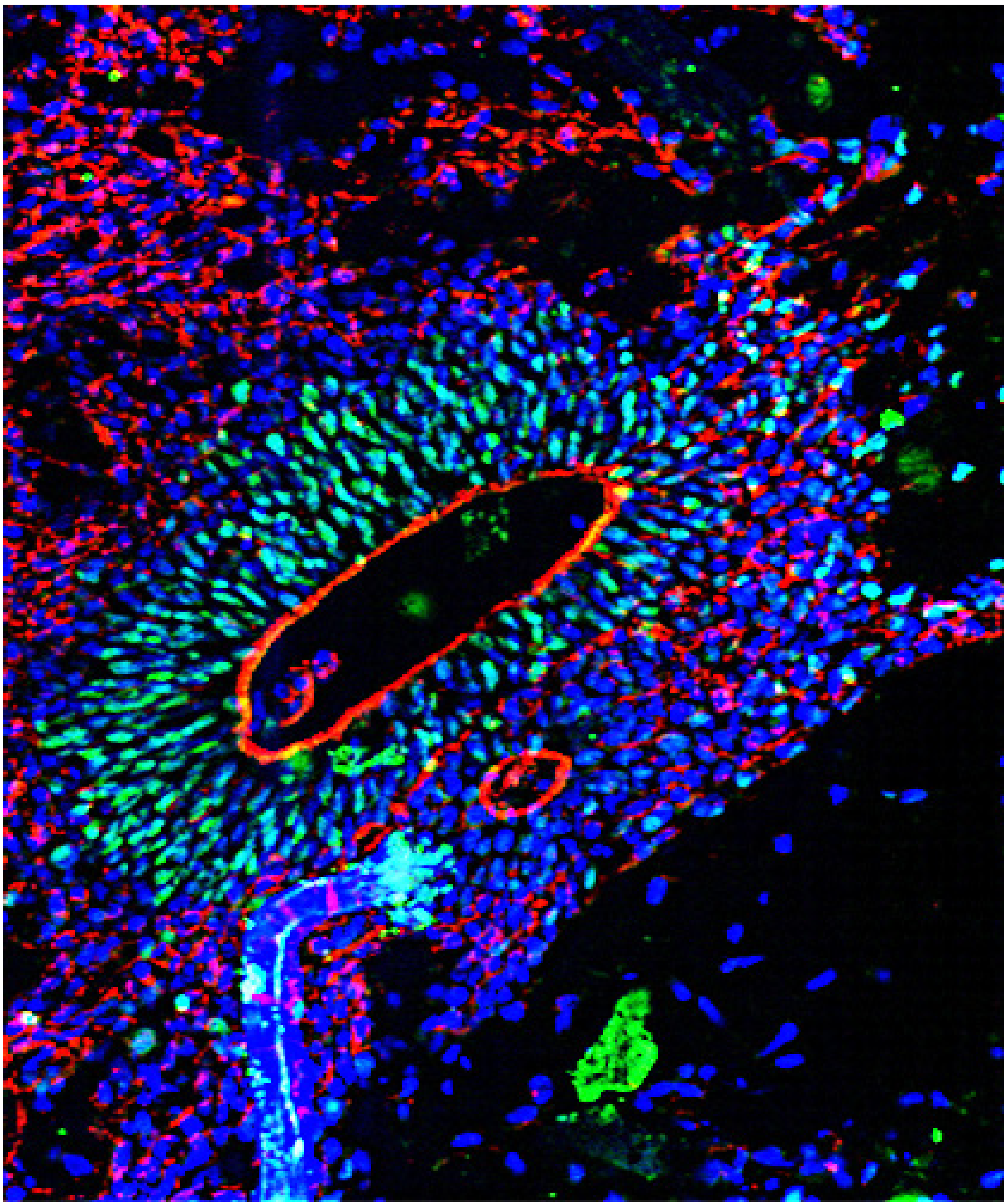
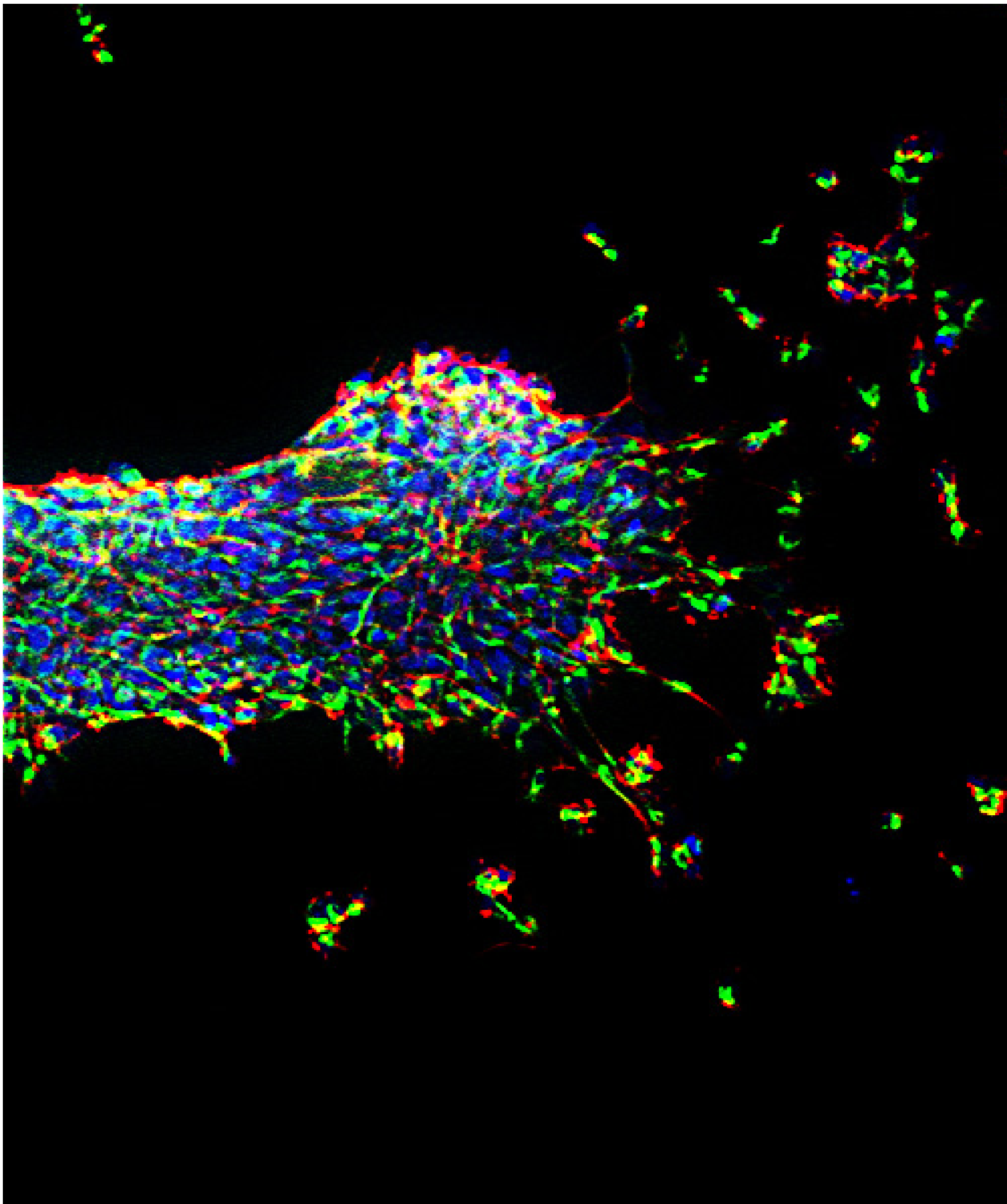
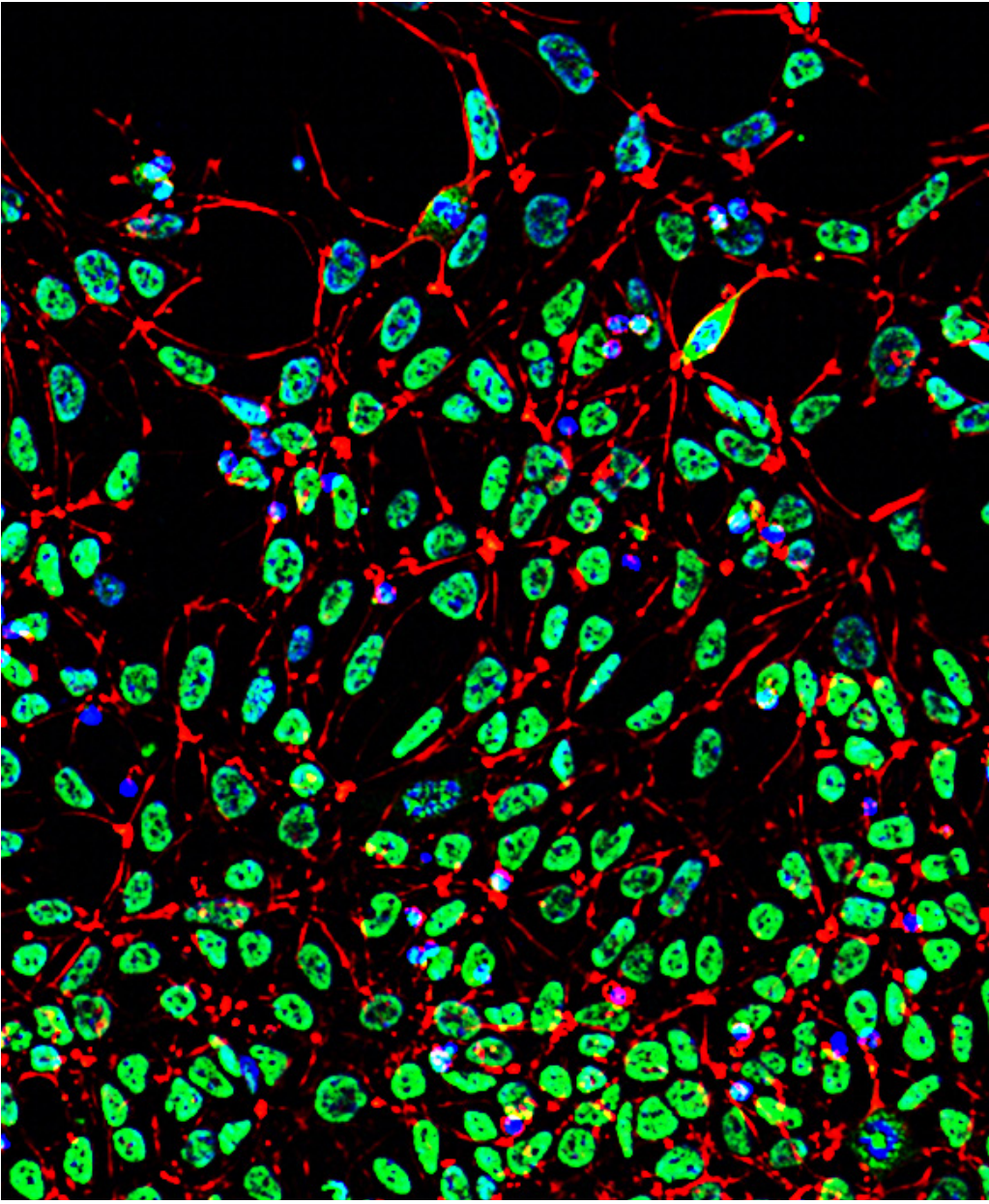
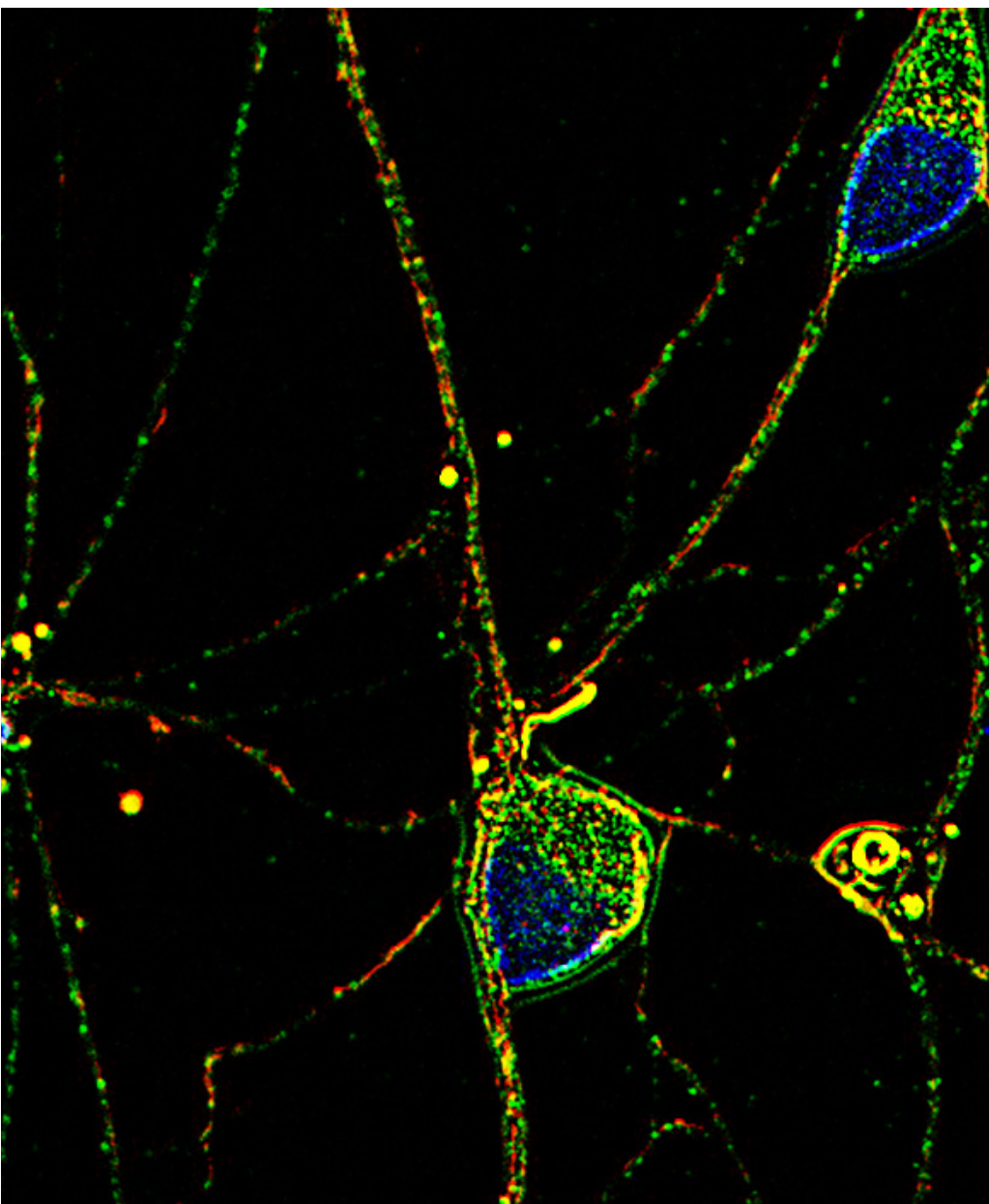
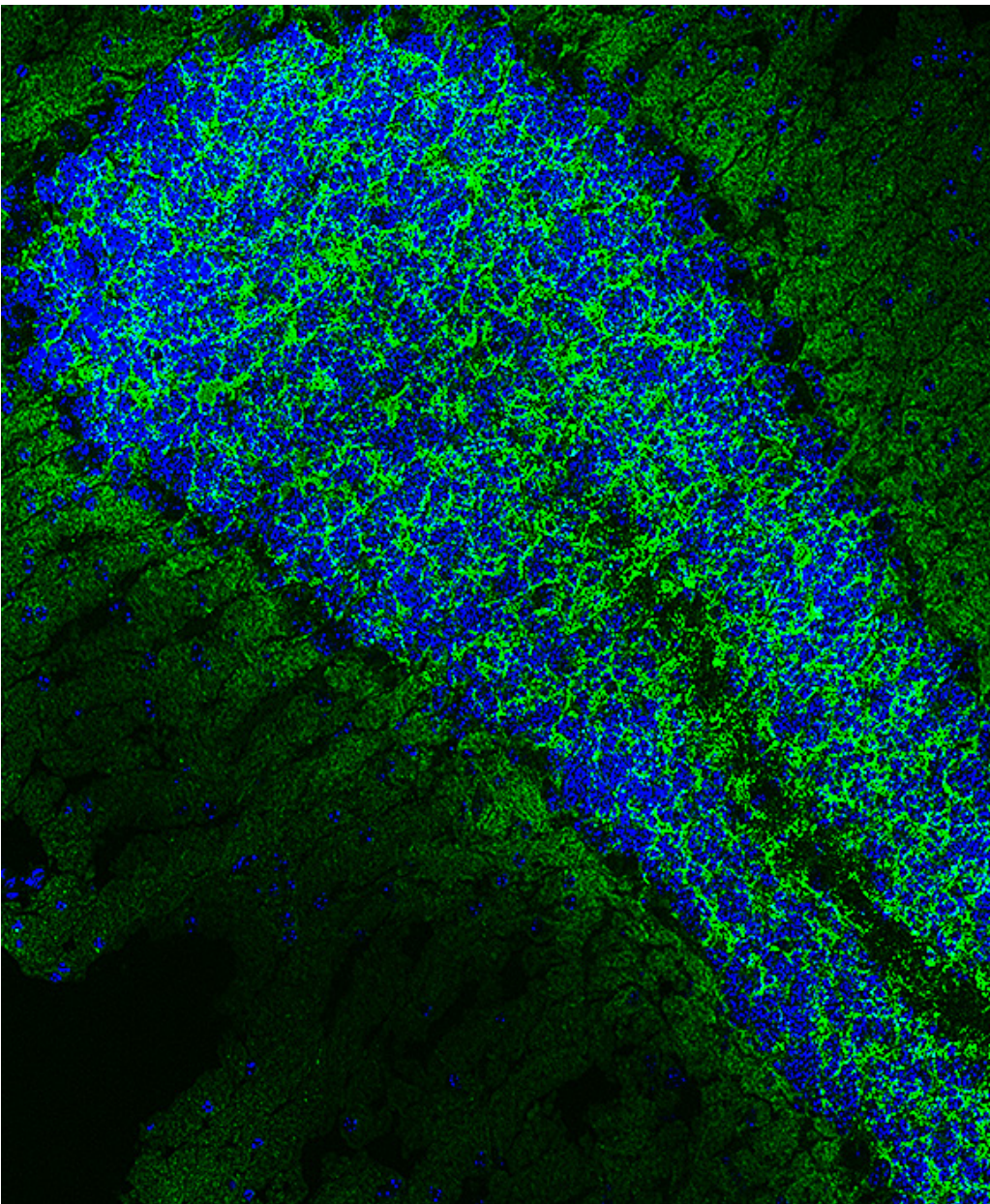
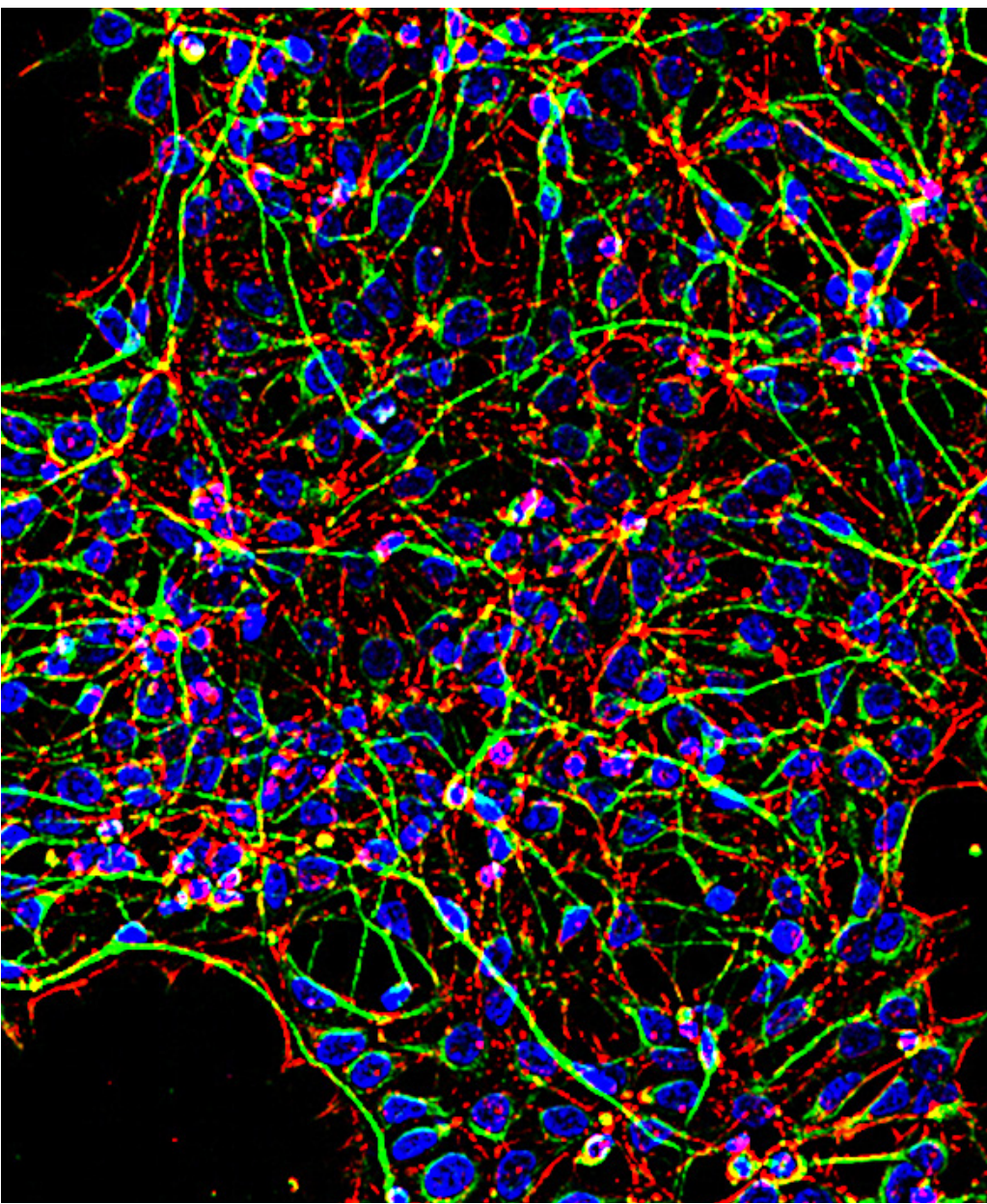
Representative markers for three germ layers		
Germ layer	Target	Antibody Cat. No. (clone number)
Ectoderm	Beta III tubulin	MA1-118 (2G10)
	OTX2	PA5-23406, MA5-15855 (1H12G8B2), MA5-15854 (1H12C4B5)
	PAX3	710178, 701147, 38-1801
	SOX1	PA5-23370, PA5-23351
Mesoderm	NKX2.5	710634 (4HCLC), 701622 (4H5L9)
	PDGFRa	PA5-16742, PA5-16571, 710169 (7HCLC), 701142 (7H13L1)
	Smooth muscle actin	PA5-16697, MA5-11547, MA5-11544 (1A4 (asm-1)), MA1-744 (mAbGEa), 710487 (17HCLC), 701457 (17H19L35)
Endoderm	Alpha-fetoprotein	PA5-16801, MA5-14666 (P5B8), MA5-14665 (F1-6P2A8-P2B9A9), 710486 (9HCLC), 703094
	GATA4	PA1-102
	GATA6	PA1-104
	NeuroG3	703206
	KLF5	42-3200

Mesenchymal stem cell (MSC) markers

Positive and negative markers of mesenchymal stem cells		
Marker type	Target	Antibody Cat. No. (clone number)
MSC-positive markers	CD105	RM5704 (IM7.8.1), RM3604 (MEC 14.7), RM2804 (M1/70.15), Q10379 (6D5), PA1-16813
	CD36	PA1-16813, MA5-16941 (SMO), MA5-14412 (185-1G2), MA1-19407 (TR9)
	CD44	RM5704 (IM7.8.1), MHCD4404, MHCD4401 (MEM-85), MA5-13890 (156-3C11), MA5-13887 (156-3C11), MA5-12394 (5F12), 710413 (19HCLC), 701406 (19H8L4)
	CD73	MA5-15537 (1D7), 41-0200 (7G2)
	CD90 (Thy-1)	MA5-17752 (IBL-1), MA5-17747 (5a-8), MA5-16683 (FF-10)
	Nestin	MA1-110 (10C2)
	STRO-1	39-8401 (STRO-1)
	CD11b	RM2804 (M1/70.15), CD11b00 (VIM12)
MSC-negative markers	CD14	MHCD1400 (TtK4)
	CD19	MHCD10500 (SN6)
	CD34	RM3604 (MEC 14.7), CD3458101 (581)
	CD79a	MA5-15234 (2F11), MA5-14556 (SP18), MA5-13212 (HMA47/A9), MA5-11636 (UCB117)
	HLA-DR	H11212 (Tu36)

Definitive endoderm, pancreatic lineage, and hepatic lineage markers

Representative markers for definitive endoderm, pancreatic lineage, and hepatic lineage		
Cell type	Target	Antibody Cat. No. (clone number)
Definitive endoderm	c-Kit	PA5-16770, CD11700 (104D2) PA5-16458, 710523 (2HCLC), 701494 (HC34LC14), 700135 (53H8L29), 348800
	CXCR4	PA3305, 358800 (12G6)
	FOXA2	MA5-15542 (7H4B7)
	GATA4	PA1-102
	GATA6	PA1-104
Pancreatic lineage	PDX1	PA5-78024
Negative surface markers (polyhormonal endocrine cells, not pancreatic progenitors)	Chromogranin A	PA5-16685, MA5-14536 (SP12), MA5-13281 (PHES), MA5-13096 (LK2H10)
Beta cells	Insulin	710289 (19HCLC), 701265 (19HAL12)
Negative markers	Glucagon	710320 (24HCLC), 710316 (3HCLC), 701296 (24H1L3)
Hepatic lineage	AAT	MIA1102 (TMF1#2-1D1), MA5-15521 (2B12), MA514661 (TMF1#4B5)
	Albumin (ALB)	MA5-14718 (12D12), MA5-14717 (10C7), MA5-14698 (1E1), MA5-14677 (2B12)
	Alpha-fetoprotein	PA5-16801, MA5-14666 (P5B8), MA5-14665 (F1-6P2A8-P2B9A9), 710486 (9HCLC)
	CK14	PA5-16722, MA5-11596 (LL002)
	Cytochrome P450 3A4	PA1-343, MA3-032 (F24 P2 B10)
	HNF1B	PA1-24459
	PROX1	P21936 (5G10)



Neural stem cell, glial lineage, and neuron markers

Representative markers for neural lineage		
Cell type	Target	Antibody Cat. No. (clone number)
Neural stem cells	FOXG2	PA5-26794
	Nestin	MA1110
	DLL3	703623
	mGluR4	702603
	POU3F2	711869
	POU3F4	711871
	mGluR2	711623
	NSE	702739
	PAX3	710178, 701147, 38-1801
	PAX6	MA1-109 (13B10-1A10), 426600
	SOX1	PA5-23370, PA5-23351
	SOX2	PA1-094, MA1-014HRP, A21295, A21294, A21282 (131-1771), 13-0300 (2.2B10), PA5-23407
Glial/astrocytes	CD44	RM5704 (IM7.8.1), MHCD4404, MHCD4401 (MEM-85), MA5-13890 (156-3C11), MA5-13887 (156-3C11), MA5-12394 (5F12), 710413 (19HCLC), 701406 (19H8L4)
	GFAP	MA5-12023 (ASTRO6), A21295, A21294, A21282 (131-1771), 13-0300 (2.2B10), PA5-23407
	S100B	710363 (16HCLC), 701340 (16H24L21)
Oligodendrocyte progenitor cells (OPCs)/ oligodendrocytes	A2B5	433110 (105)
	NG2	37-2700 (D120.43/D4.11/N143.8/N109.6), 37-2300 (N143.8)
	OLIG2	P21954
	PDGFRa	PA5-16742, PA5-16571, 710169 (7HCLC), 701142 (7H13L1)
Neurons	Beta-3 tubulin	MA1-118 (2G10), 480011 (38F4), 322600
	DCX	48-1200
	VAMP1	702787
	MAP2	MA5-12826 (AP18), MA5-12823 (AP20), 13-1500 (M13)
	SNAP25	701991
	Neurofilament par, H, M, L	MA1-2012 (3G3), MA1-2011 (3H11), MA1-2010 (DA2), 130500 (RMO-44)
Dopaminergic (DA) progenitors/DA neurons	OTX2	PA5-23406, MA5-15855 (1H12G8B2), MA5-15854 (1H12C4B5)
	PITX3	710212 (7M5HCLC), 701181 (5H10L5), 38-2850
	TH	P21962
GABA neurons	Calretinin	PA516681, MA5-14540 (SP13), 710559 (4HCLC)
	GABA	PA5-32241
	GAD2/GAD65	PA5-22260, PA5-18369, MA5-18053 (144), 398200 (ZG002)
	GAD65 and GAD67	PA1-84572
Motor neuron progenitors/ motor neurons	Somatostatin	MA5-16987 (YC7)
	CHAT	PA5-29653, PA1-9027, PA1-4738, PA1-4710, PA1-18313, 48-1200
	HB9 (MNX1)	PA5-23407
	HOXB4	PA5-23366
	ISL1	PA5-27789, MA5-15516 (1B1), MA5-15515 (1H9)
	NGN2	PA5-34472, PA5-11892
	NKX6.1/6.2	PA5-23070
	OLIG1/2	P21954
	Synapsin	A6442

Hematopoietic lineage markers

Representative markers for hematopoietic stem cells and progenitor cells		
Cell type	Target	Antibody Cat. No. (clone number)
Mesoderm	APLNr	PA5-33343
	KDR (FLK1)	PA5-16487, 392400 (ZV001)
Hematovascular mesodermal precursors	GATA2	710242 (11HCLC)
	Runx1	710233 (3HCLC), 701202 (3H2L6)
	SCL/TAL-1	PA5-30586
Angiogenic hematopoietic progenitors	CD235a (Glycophorin A)	MHGLA01 (CLB-ery-1 (AME-1)), MA5-12484 (JC159)
Hematopoietic stem cells	CD3e	MHCD0300, MA5-14482 (EP449E), HM3401, 70303
	CD43	MA5-16978 (W3/13)
	CD49f (integrin a6)	710209 (5HCLC), 701178 (5H14L18)
	CD90 (Thy-1)	MA5-17752 (IBL-1), MA5-17747 (5a-8), MA5-16683 (FF-10)
	c-Kit/CD117	PA5-16770, CD11700, 710523, 701494, 700135, 348800
	Ly-6A/E (Sca-1)	MA5-17833 (CT-6A/6E), MA1-70082 (D7)
Negative marker	CD38	MHCD3801 (HIT2), MA514413 (38C03 (SPC32))