Supplemental Table 1. Initially selected cell markers for identifying cell types in skeletal muscle

Cell Type	Markers	References
MSC	CD73, CD90, CD105, CD271	(31, 75)
Pericytes	CD146, NG2, alkaline phosphatase, αSMA and CD90	(16,17,29, 34)
Myogenic cells	CD56	(76)
Interstitial cells		
Fibroblasts	TCF7L2, CD34	(8,15)
Telocytes	CD34	(8)
Fibroadipogenic progenitor cells	PDGFRα, CD15	(6,7)

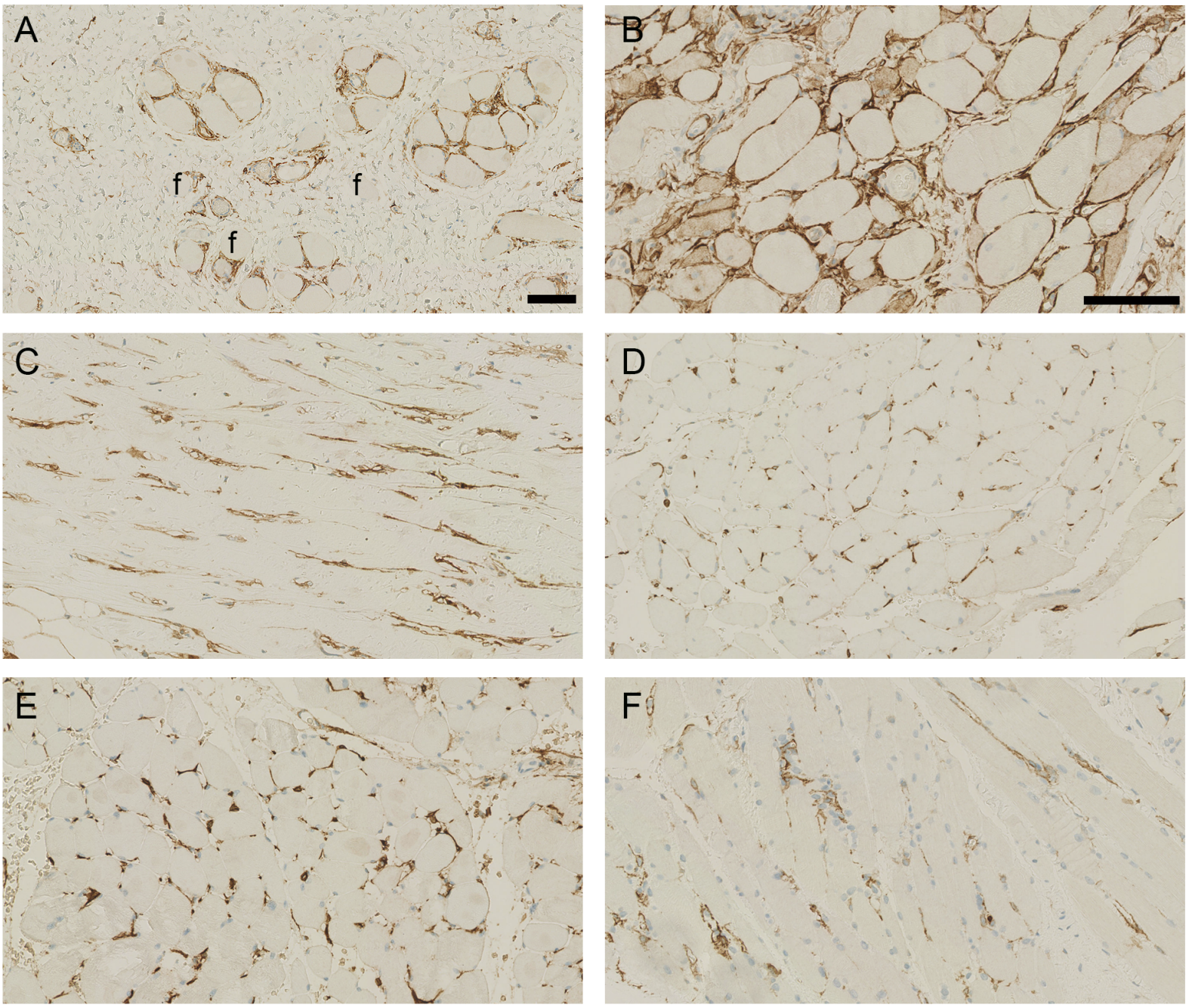
Supplemental Table 2. Materials Used in the Study

Healthy muscle	Age /years	**Atrophy**	Age /years
Normal	0.2	Plantar muscle, angioma	28
Normal	2	Type 2 atrophy	74
Normal	2	Supraspinatus, type 2 atrophy	61
Normal	5	Type 2 atrophy	62
Normal	11	**Inflammation**	
Normal	15	Absces	10
Normal	15	Dermatomyositis, S3: NG2/ αSMA	25
Temporalis, RC	24	Dermatomyositis	33
Normal	26	Polymyositis, anti-synthetase syndrome	43
Normal	30	Extra ocular, myositis (IgG4)	45
Tongue	30	IBM	53
Normal	31	Intercostal muscle, necrosis	54
RC	31	IMN, Fig. 4A, S2: CD45; TCF7L2 C, D, E and G; AP E and F and S3: nestin	55
RC	33	IBM	61
Fig. 2 and S3: CD90 and CD146	45	IBM	62
RC	50	Dermatomyositis sarcoidosis	62
Pectoralis, RC	50	IBM	63
RC	51	IMN, Fig. 1B	67
Normal	54	IMN, statin induced	68
Fig. S2: TCF7L2 A and B	58	IBM	68
Normal	73	IBM	70
RC	74	IBM, Fig.1A	71
		IBM	71
Denervation		Slight inflammation	73
Denervation	7	IBM, Fig. 4B, Fig. 5 and Fig. 7C	76
Neurogenic atrophy, Fig. 7B, S3: αSMA	17	IBM fatty degeneration	79
Kennedys disease, Fig. 7A	49	IBM fatty degeneration	70
Denervation	51		
Gastrochnemius	57	**Ischemia**	
Denervation	57	Gracilis, compartment syndrome, Fig. 6	37
Denervation	67	Triceps surae	60
Denervation	68	Triceps surae	73
Denervation	75	Triceps surae	75
Myopathy		Triceps surae	85
Degenerative changes/myopathy	2	Triceps surae	90
Congenital myopathy	2	**Ectopic**	
Degenerative changes	29	Skin, rhabdomyomatous harmatoma, S1	11
Vacuolar myopathy	40		
Degenerative changes, S4	41		
Degenerative changes, mitochodrial myopathy	74		
Degenerative changes/myopathy	79		

The biopsies were taken from m. quadriceps unless another muscle is stated. INM: Immune-mediated necrotizing myopathy, IBM: inclusion body myositis, RC: reactive changes, AP:alkaline phosphatase

S1. Expression of endomysial CD10 in different skeletal muscles. A: In this example of ectopic skeletal muscle, CD10 is expressed between muscle fibers in a cutaneous hamartoma consistent with hamartomas being composed of all normal components of a tissue. However, in the interface between muscle fibers (f) and connective tissue the CD10 expression is scarce or absent. Rhabdomyomatous mesenchymal hamartoma of the skin. B-F: CD10 expression in various skeletal muscles. B: external eye muscle (IgG4 disease), C: m. pectoralis major, D: m. temporalis, E: pharynx muscle and F: tongue.

A: scale bar = 100 μm, B-F: scale bar = 100 μm


A
f
f
f
B
C
D
E
F

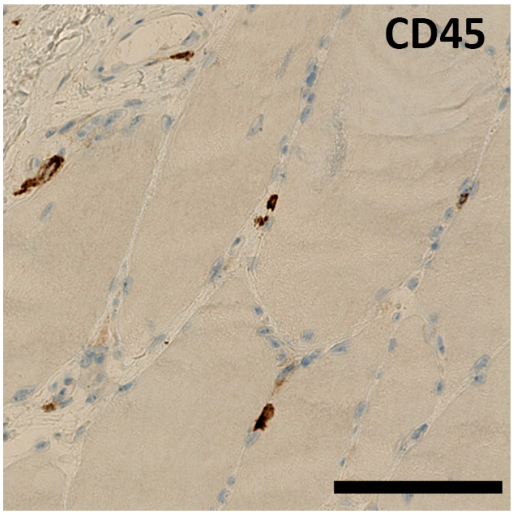
S2. CD45, TCF7L2 and alkaline phosphatase

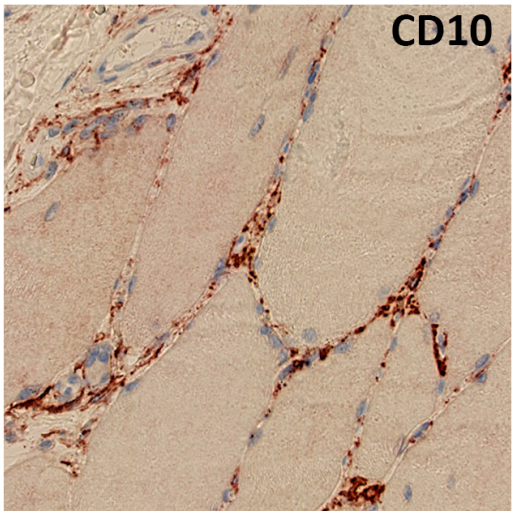
CD45: CD10+ cells do not express CD45 shown by SIMPLE. Scale bar = 100 μm

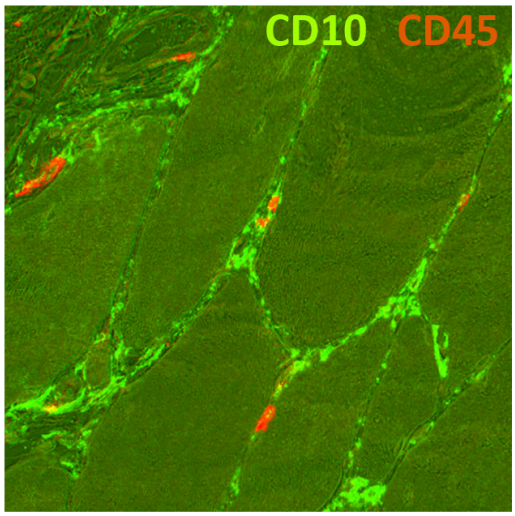
TCF7L2: A and B: the anti-TCF7L2 diluted 1:200 and 1:1000 respectively (healthy muscle) and C, D, and E the anti-TCF7L2 diluted 1:200, 1:400 and 1:1000 respectively. A reduction in antibody concentration results in a reduced number of TCF7L2 positive nuclei. C, D, E and G show interstitial cells in an immune mediated necrotizing myopathy. F and G show double staining for CD10 (red) and TCF7L2 (brown). F: An interstitial CD10+/ TCF7L2+ cell (arrow) in normal muscle. In capillaries (c) TCF7L2 is strongly expressed in endothelial cells but also stains adventitial cells. G: In damaged muscle both CD10+ cells with TCF7L2 (black arrows) and without TCF7L2 (white arrows) are seen. Scale bar for A-E and G = 100 μm, F=50 μm.

Alkaline phosphatase: Alkaline phosphatase expression shown by enzyme histochemistry (A and D), single immunohistochemistry (B and E) and in combination with αSMA or CD10 (C and F). A and B: alkaline phosphatase is seen in endothelial cells. C: αSMA (red) combined with alkaline phosphatase (brown) demonstrates the αSMA+ pericyte surrounding the alkaline phosphatase+ endothelial cells. D: Enzyme histochemistry for alkaline phosphatase in damaged muscle shows staining in the periphery of damaged fibers. E: Alkaline phosphatase is widely distributed in interstitial cells in damaged muscle. F: CD10+ cells (red) are seen together with alkaline phosphatase (brown, black arrows) or without alkaline phosphatase (white arrows). A-C: biopsies from normal muscle, D: from a toxic myopathy and E and F: from an immune mediated necrotizing myopathy. Scale bar for A, B, C, D and F= 50 μm and E=250 μm.

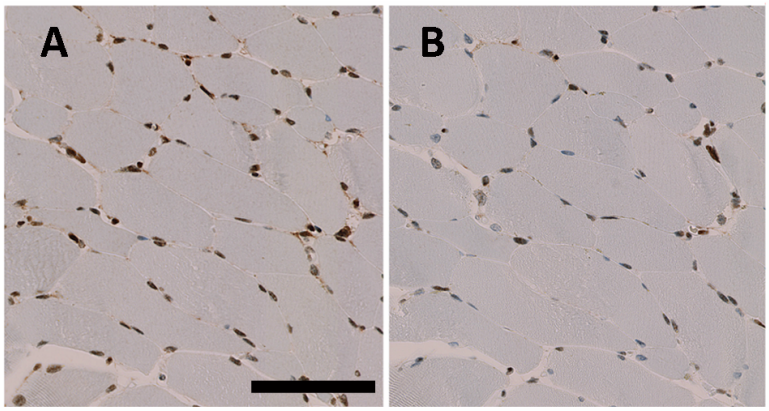
CD45

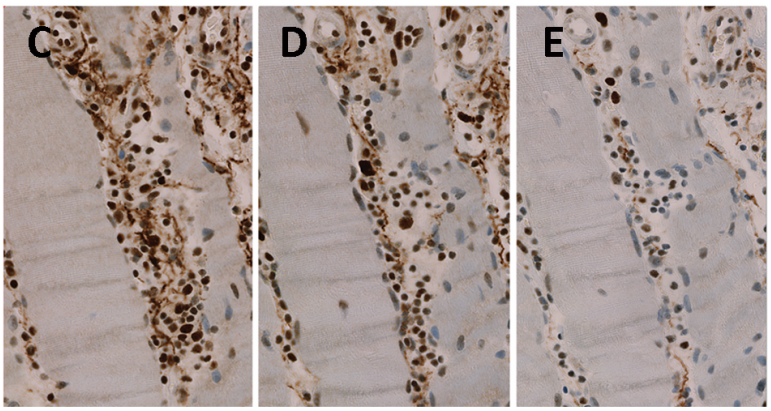


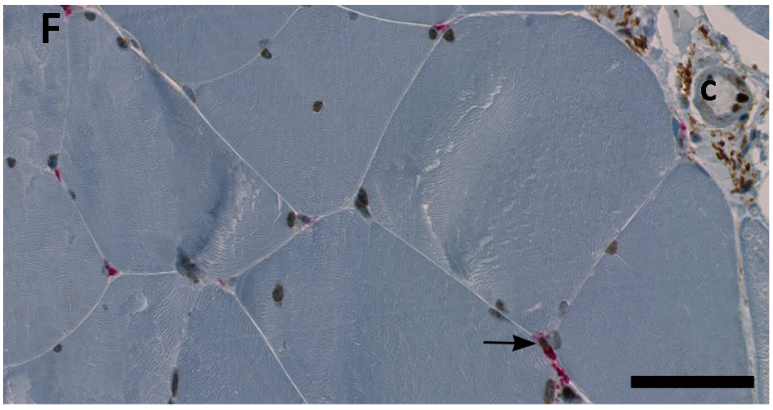


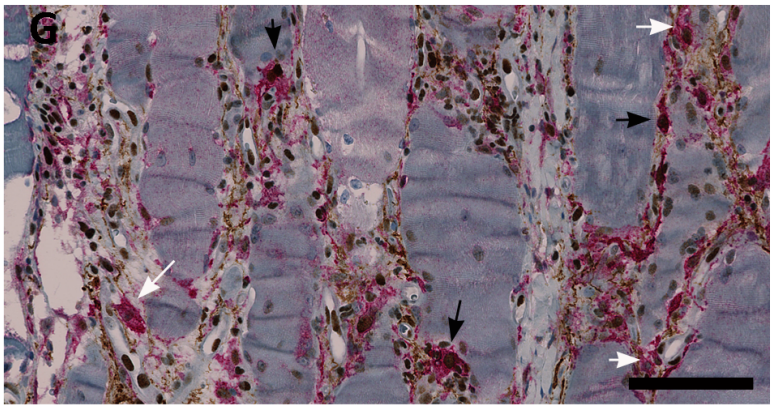


TCF7L2

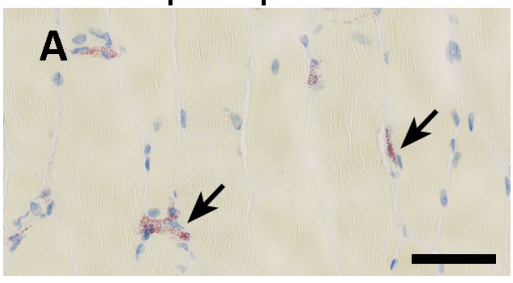


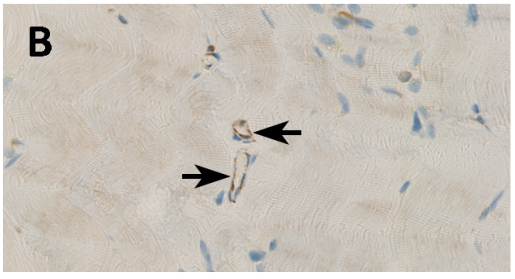


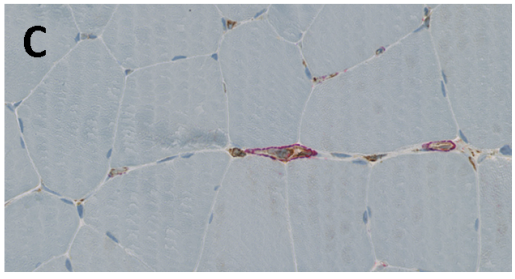


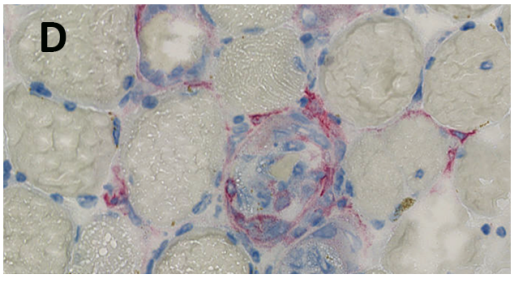


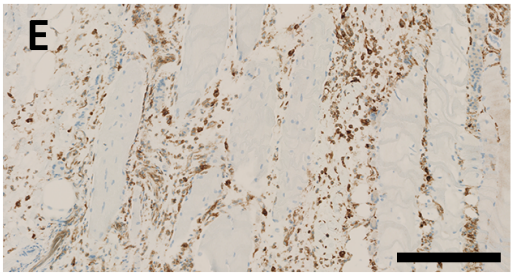
Alkaline phosphatase

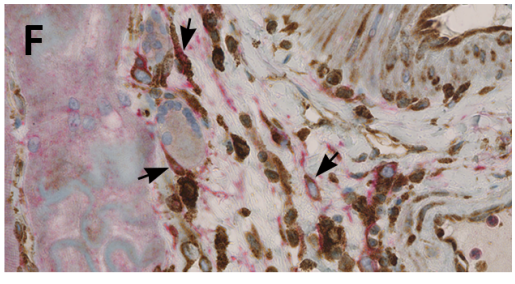








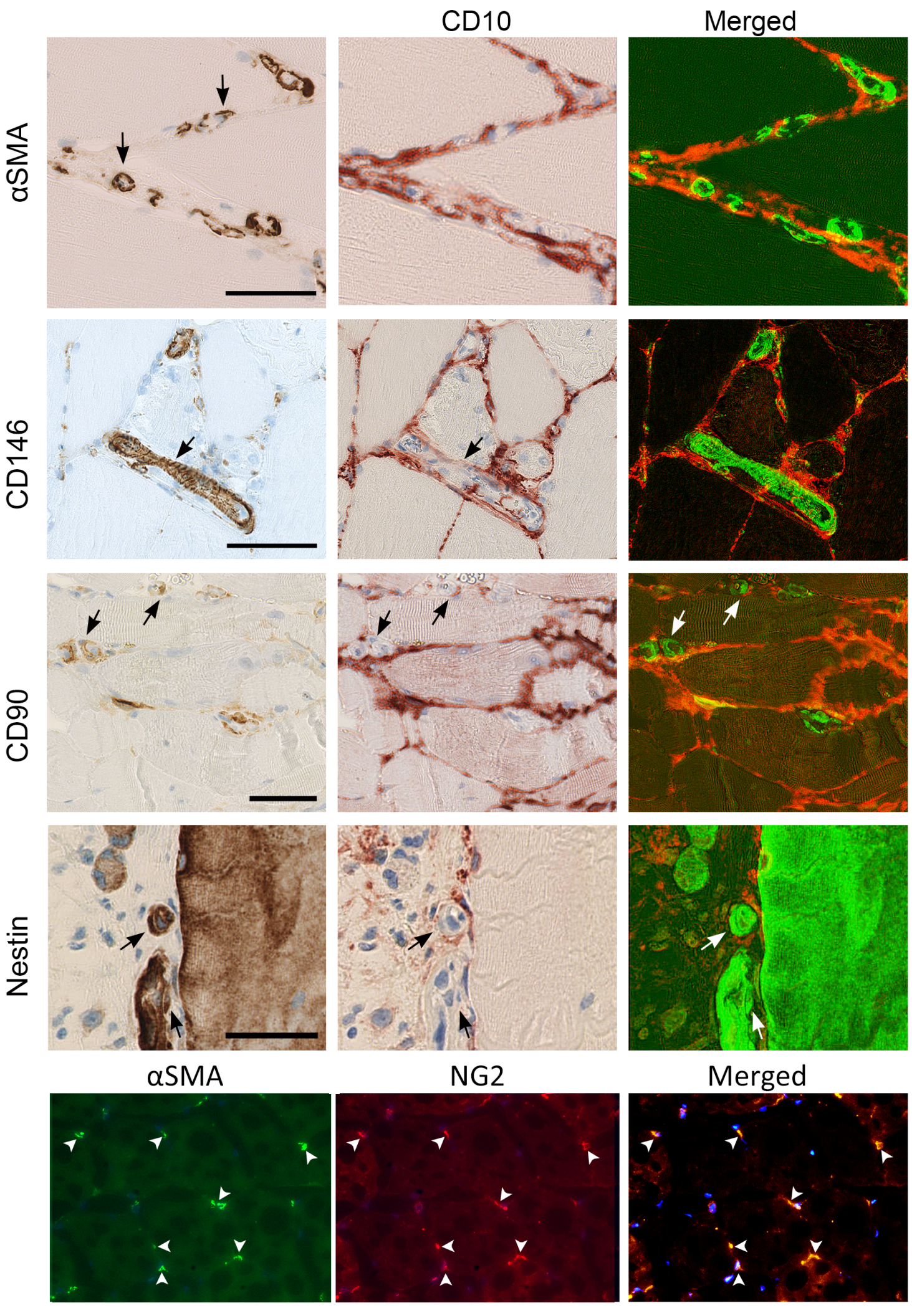




S3. Marker expression in pericytes.

αSMA, CD146 and CD90 are expressed in pericytes (arrows) while CD10 is present at the abluminal side of the endomysial pericytes. Nestin can be found in some pericytes (arrows). αSMA+ cells also express NG2 (arrow heads) indicating that αSMA in the endomysium stains pericytes. CD10 combined with αSMA, CD146 and CD90 were shown by SIMPLE. The NG2/αSMA staining was performed with immunofluorescence on cryosections.

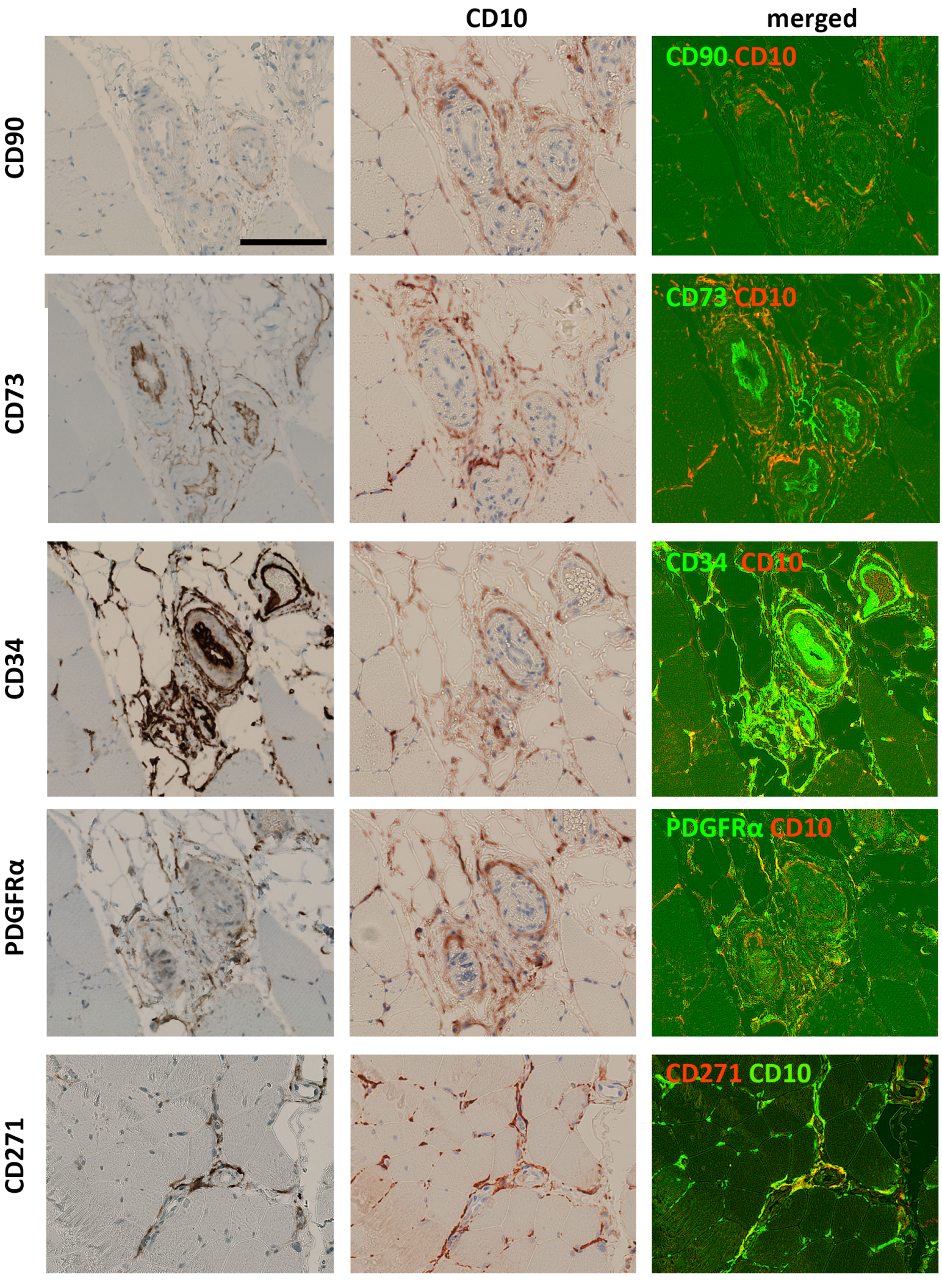
Scale bars for αSMA, CD90 and nestin = 50 μm and scale bar for CD146 = 100 μm


CD10
Merged
αSMA
CD146
CD90
Nestin
αSMA
NG2
Merged

S4. Blood vessels

In blood vessels, CD10 is seen in adventitia particularly adjacent to the media. CD90 is found in the inner adventitia where it co-localizes with CD10. CD73 is present in the adventitia and partly co-localizes with CD10. In addition endothelial cells are stained. CD34 is expressed in the adventitia and endothelial cells. In adventitia CD34 co-localizes with CD10 particularly in the inner layer close to media. PDGFRα co-localizes with CD10 in the outer layer of adventitia. CD271 co-localizes with CD10 in the adventitia. SIMPLE technique was used.

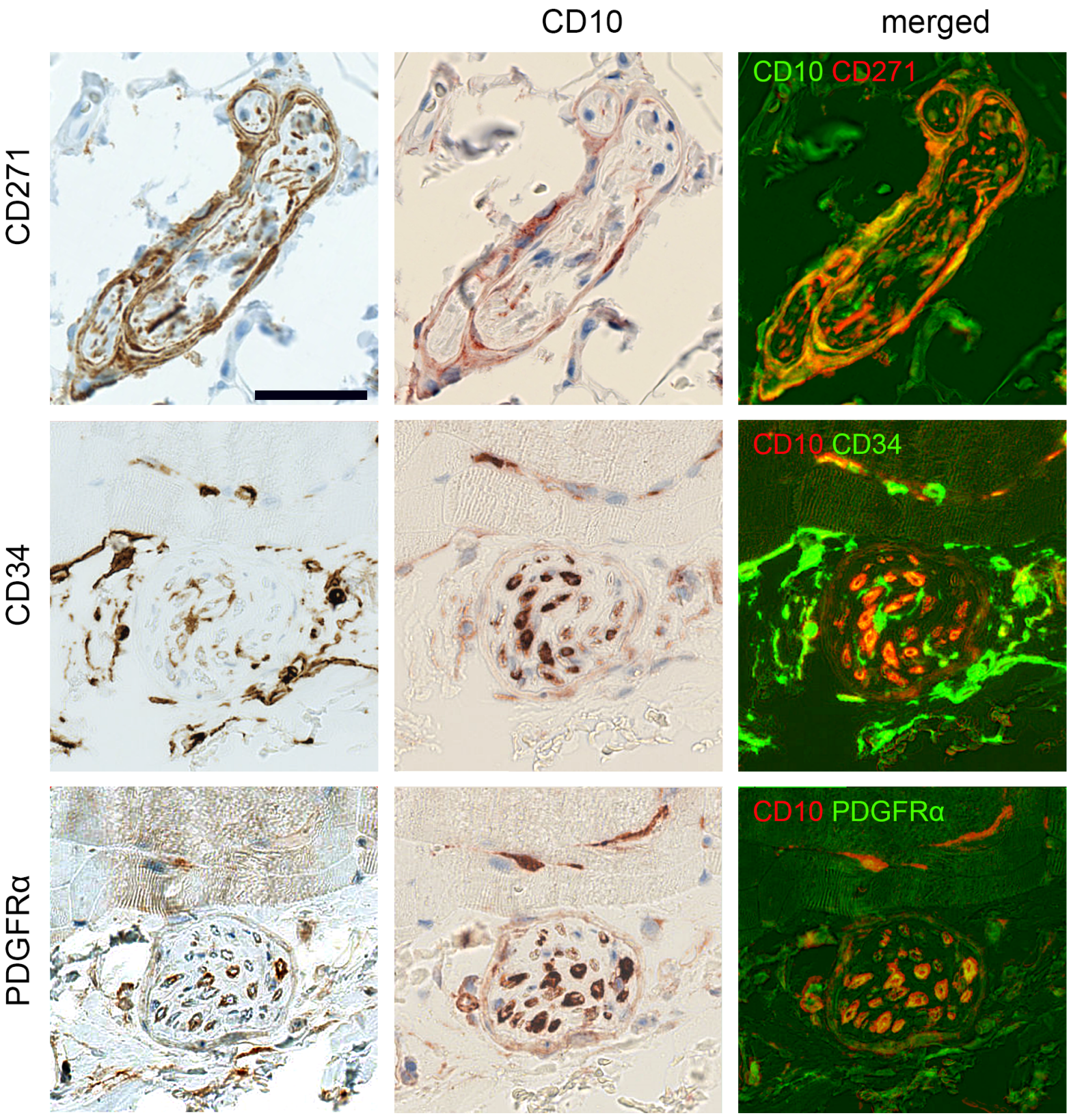
Scale bar = 100 μm


CD10
merged
CD90
CD73
CD34
PDGFRα
CD271
CD90 CD10
CD73 CD10
CD34 CD10
PDGFRα CD10
CD271 CD10

S5. Nerve

In intra muscular nerves CD10 in myelinating Schwann cells co-localize with CD271 and PDGFRα and with CD271 in perineurium. No co-localization is found with CD34

Scale bar= 50 μm.


CD10
merged
CD271
CD34
PDGFRα
CD10 CD271
CD10 CD34
CD10 PDGFRα