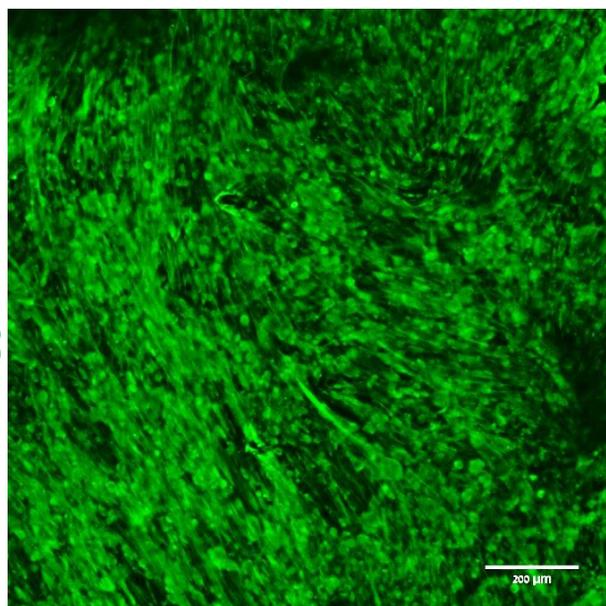
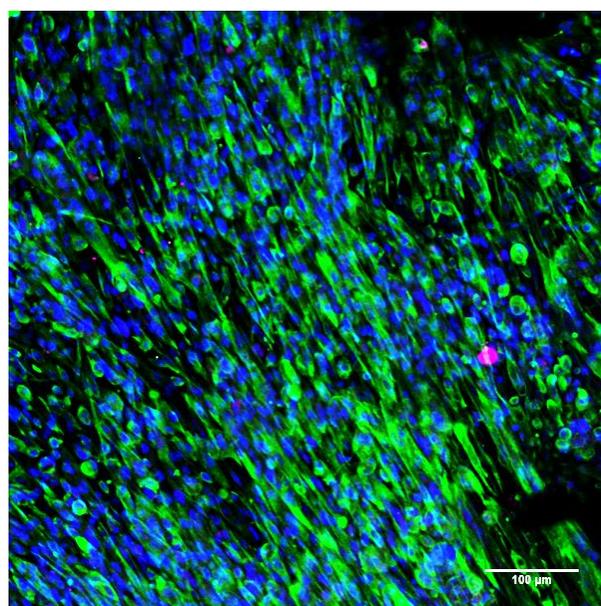
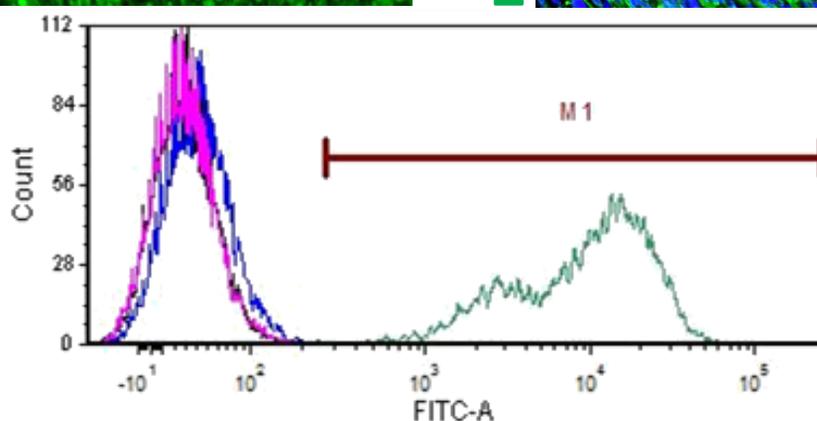
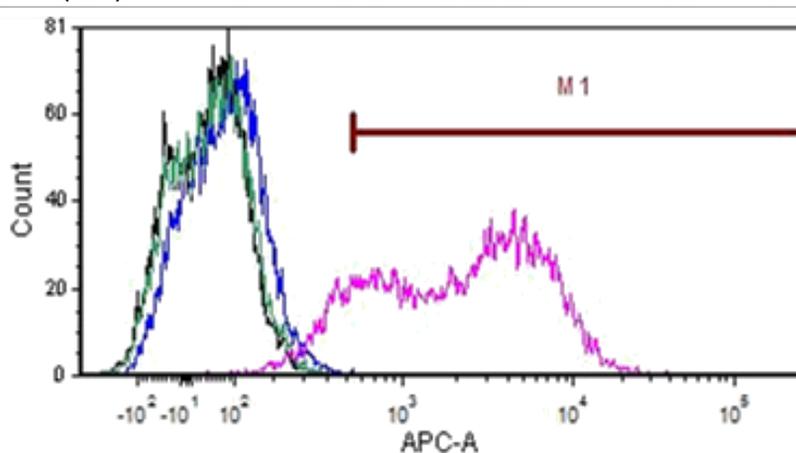


A**Desmin****DAPI****Desmin****B**

Histogram #	Filename	Parameter	Low bound	High bound	# of Events	% of gated cells	Median	Geometric Mean	CV
1	SCs-2 nd antibody only	FITC-A	267.95	254300.03	0	0.00	n/a	n/a	n/a
2	Unstained SCs	FITC-A	267.95	254300.03	2	0.02	283.388	283.53	7.02
3	SCs-desmin (A488)	FITC-A	267.95	254300.03	9180	99.43	10410.50	8389.41	80.03
4	SCs-MYH (A647)	FITC-A	267.95	254300.03	7	0.08	312.08	344.72	26.87



Histogram #	Filename	Parameter	Low bound	High bound	# of Events	% of gated cells	Median	Geometric Mean	CV
1	SCs-2 nd antibody only	APC-A	542.12	262144.00	8	0.09	773.55	936.94	78.47
2	Unstained SCs	APC-A	542.12	262144.00	2	0.02	648	645.89	11.39
3	SCs-desmin (A488)	APC-A	542.12	262144.00	12	0.13	847.8	1011.04	79.5
4	SCs-MYH (A647)	APC-A	542.12	262144.00	7922	85.18	2907.9	2683.90	115.68

Figure S1. Flow cytometry analysis of desmin- and myosin-positive mouse SCs. (A)

Representative confocal images of SCs, 7 days post-seeding. Desmin-positive cells are stained

in green and nuclei are stained in blue. **(B)** Approximately 99% of the SCs isolated from the

tibialis were desmin-positive. **(C)** Approximately 85% of the cells within the cell culture were

myosin-positive.

Desmin DAPI Pax 7

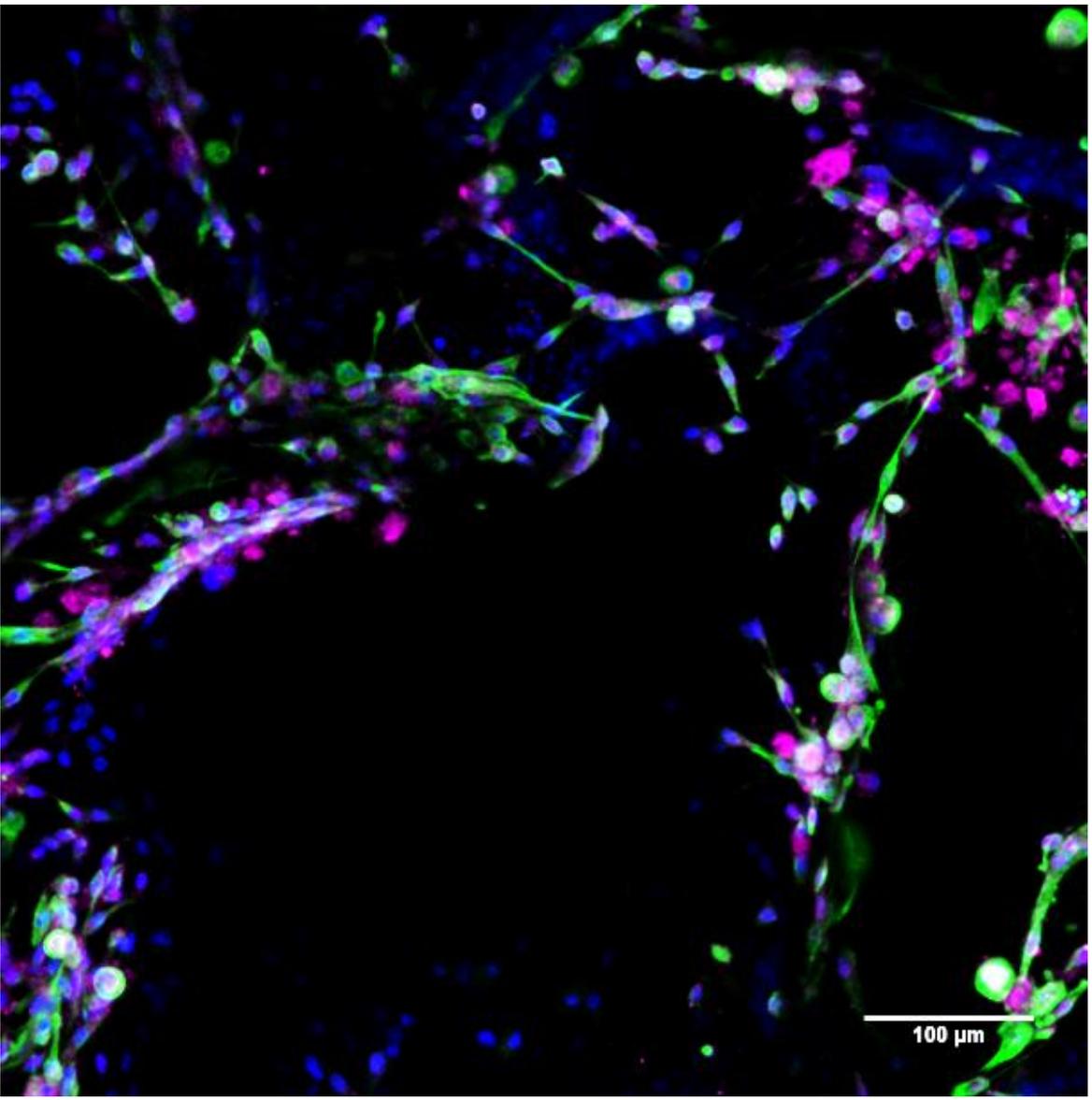
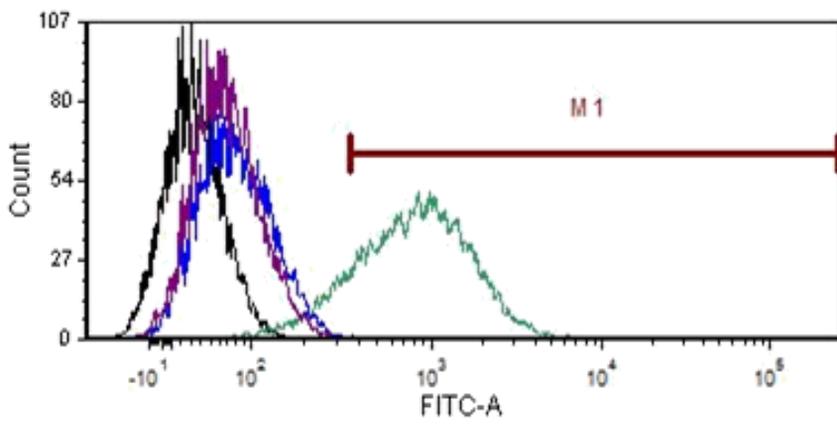


Figure S2. Representative confocal images of SCs, 7 days post-seeding. Desmin-positive cells are stained in green, Pax 7 positive cells are stained in magenta and nuclei are stained in blue; scale bar = 100 μm .



Histogram #	Filename	Parameter	Low bound	High bound	# of Events	% of gated cells	Median	Geometric Mean	CV
1	Unstained ECs	FITC-A	356.74	254300.77	0	0.00	n/a	n/a	n/a
2	ECs-CD31 (A488)	FITC-A	356.74	254300.77	7265	84.09	915.56	945.31	68.07
3	ECs-2 nd antibody only	FITC-A	356.74	254300.77	7	0.08	391.98	839.68	193.35
4	SCs-CD31 (A488)	FITC-A	356.74	254300.77	5	0.06	382.11	623.12	177.31

Figure S3. Flow cytometry analysis of CD31-positive mouse ECs.

Approximately 84% of the mouse ECs were CD31-positive.

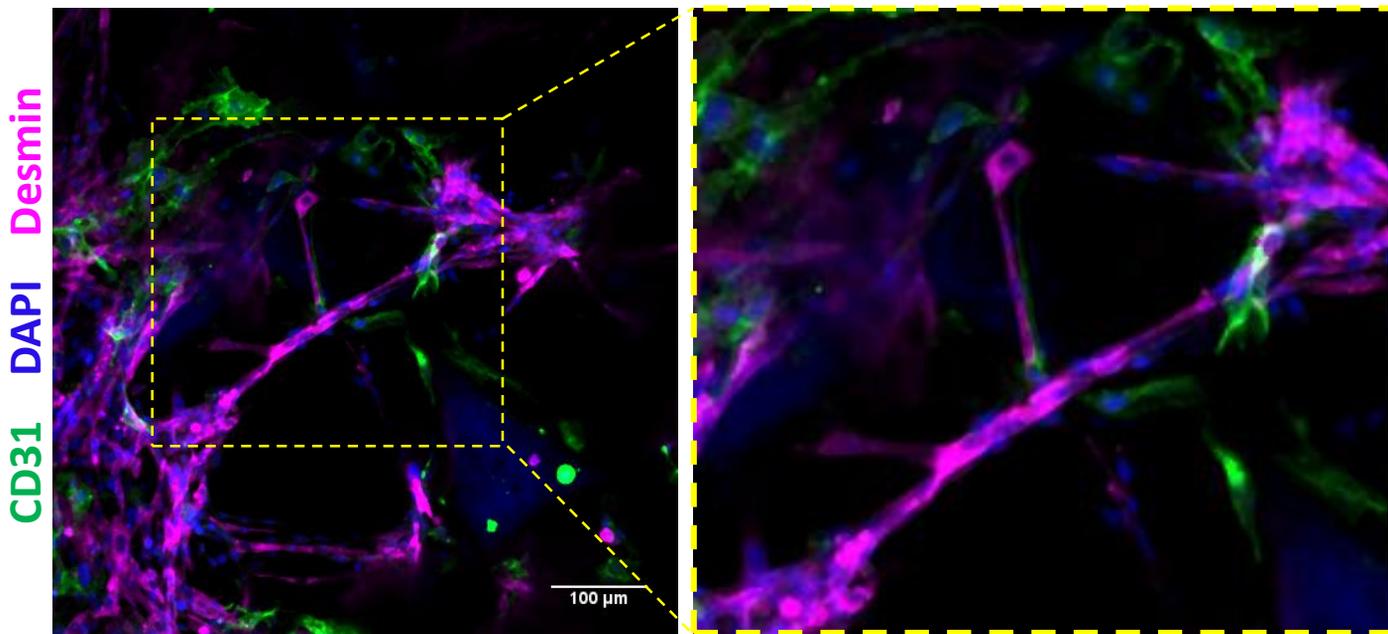


Figure S4. Representative confocal images of whole-mount immunofluorescent scaffold populated with ECs and SCs, 14 days post-seeding. ECs are stained in green, desmin-positive cells are stained in magenta and nuclei are stained in blue; scale bar = 100 μm.

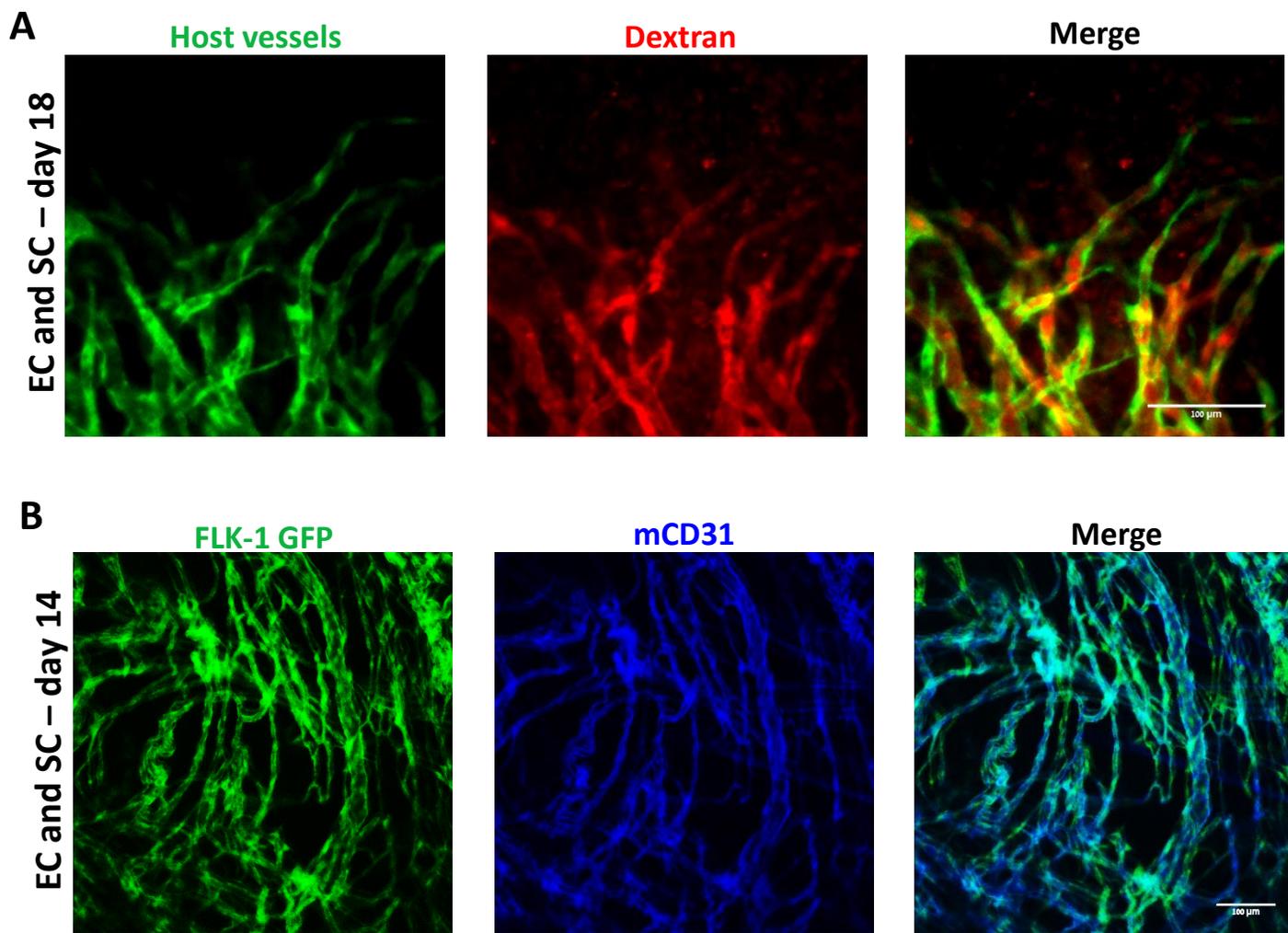


Figure S5. (A) Representative intravital images, obtained through the AIW, of an EC- and SC-embedded graft, 18 days post-transplantation. Green: host vasculature; red: TRITC-conjugated dextran. Scale bar = 100 μm . (B) Representative intravital images, obtained through the AIW, of an EC- and SC-containing graft, 14 days post-transplantation. Green: Flk-1 GFP vessels; blue: mouse CD31. Scale bar = 100 μm .

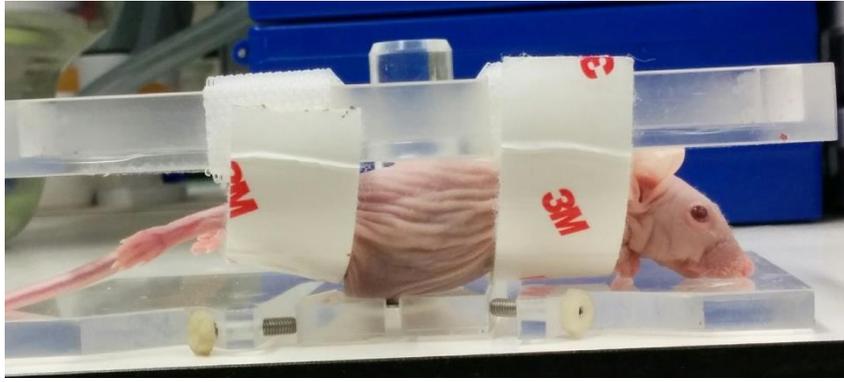
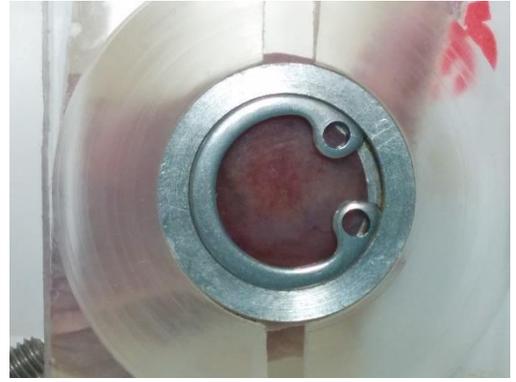
A**B**

Figure S6. Image of a mouse stabilized in a custom-made SID for intravital confocal imaging. (A) lateral view of an anesthetized mouse in the SID. **(B)** Representative image of a mouse with an abdominal imaging window (AIW) 14 days post-surgery.