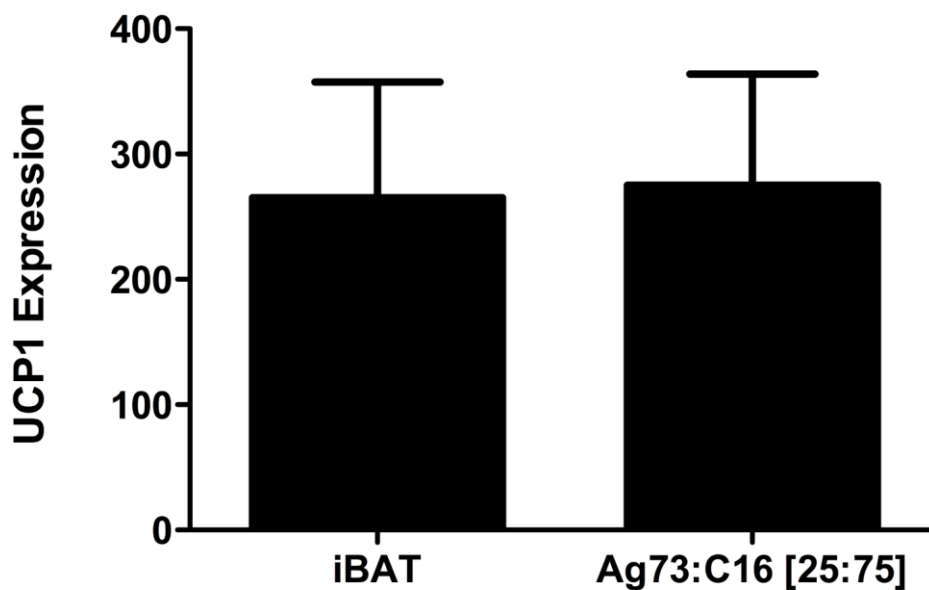


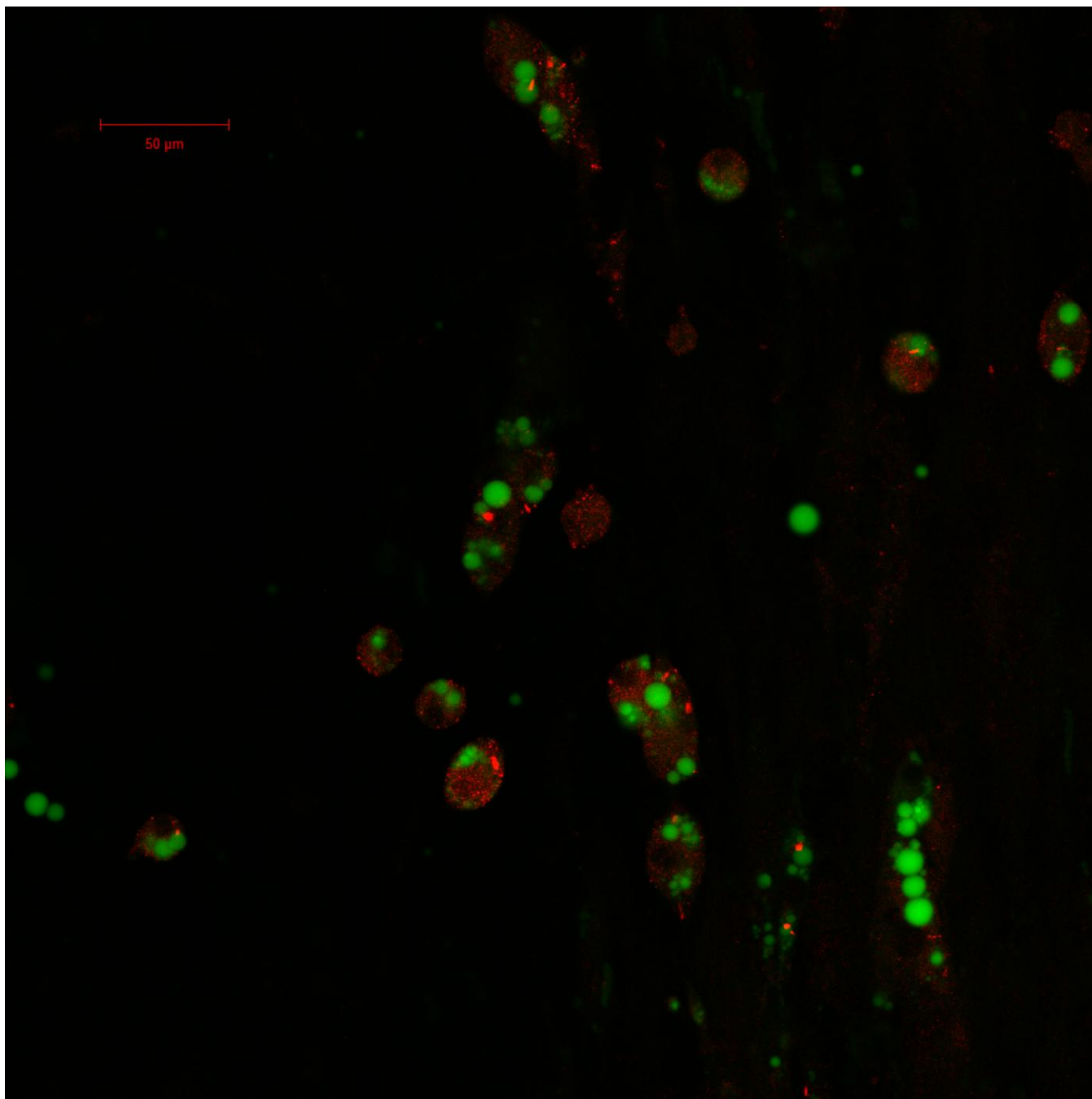
SUPPLEMENTARY DATA

Supplementary Figure 1. UCP1 expression of WAT and BAT derived ADMSCs. Differentiated ADMSCs derived from interscapular BAT plated on TCPS or perigonadal WAT derived ADMSCs plated on the Ag73 and C-16 (25:75 molar ratio) coated plates, GAPDH normalized UCP1 mRNA expression relative to WAT (n=5).



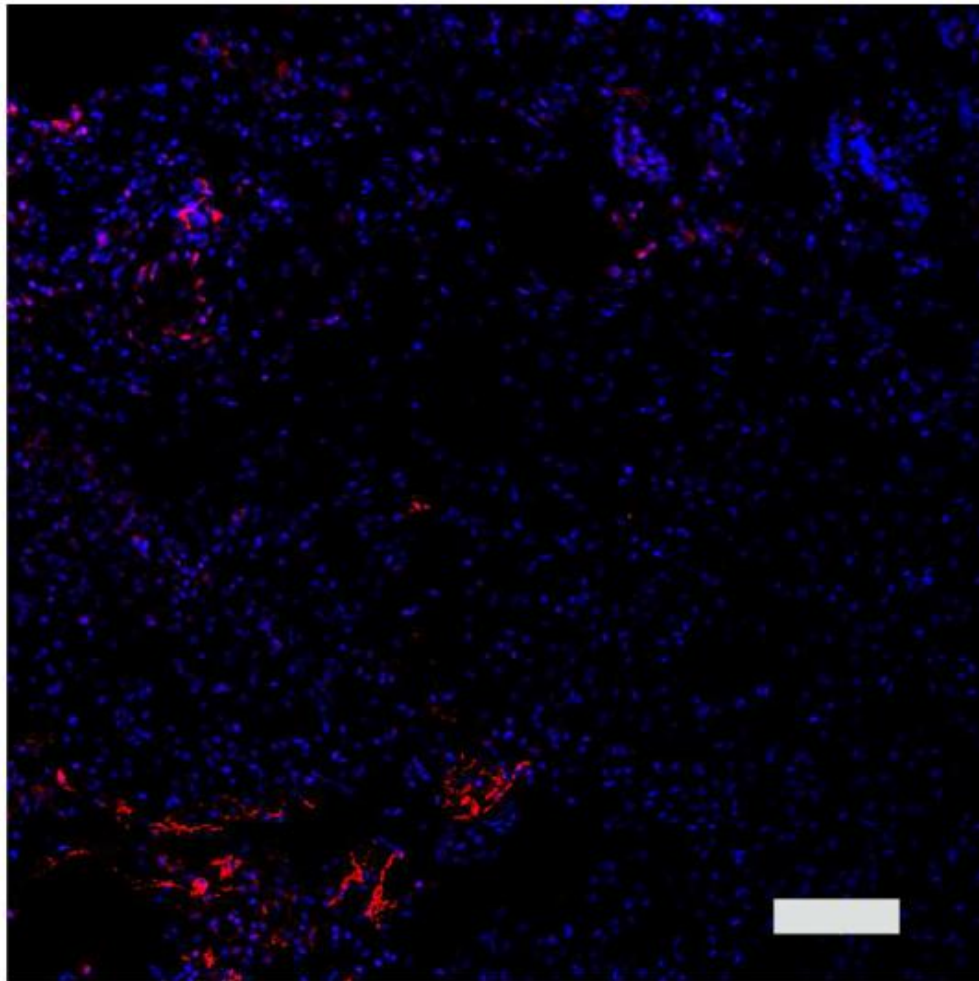
SUPPLEMENTARY DATA

Supplementary Figure 2. UCP1 and neutral lipid staining of *in vitro* hydrogel. IHC of differentiated ADMSCs in Ag73:C16 hydrogel with UCP1 (red) and Bodipy3922 (green).



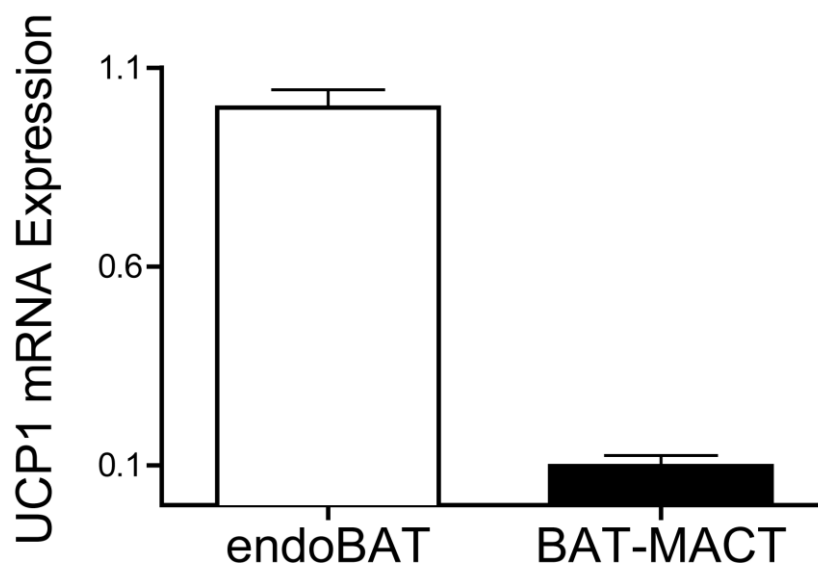
SUPPLEMENTARY DATA

Supplementary Figure 3. Tyrosine hydroxylase expression in BAT-MACT. Two weeks post implantation BAT-MACT were stained with DAPI (blue) and tyrosine hydroxylase specific antibodies (red).



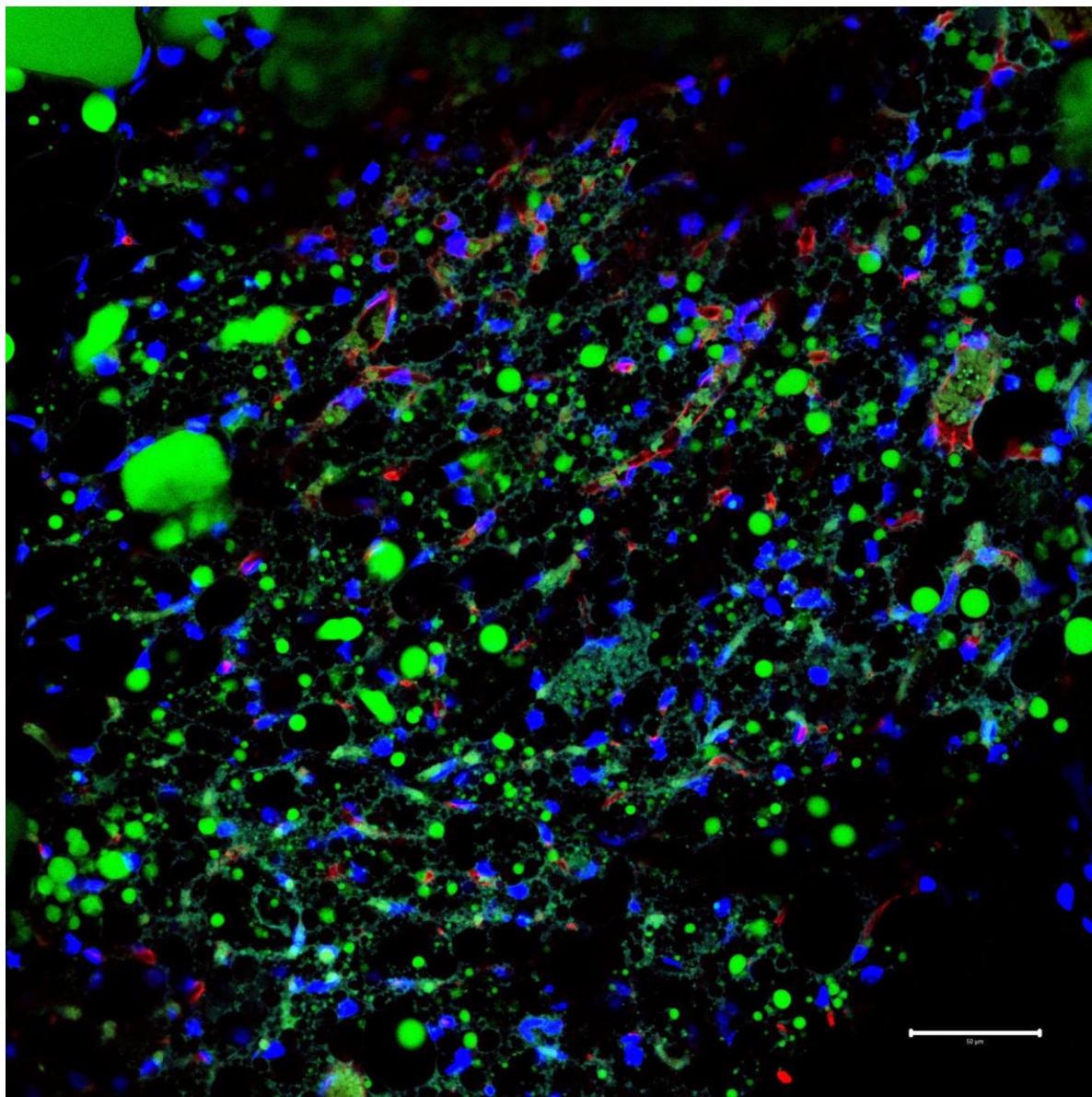
SUPPLEMENTARY DATA

Supplementary Figure 4. UCP1 expression of BAT-MACT compared to endogenous BAT. GAPDH normalized UCP1 mRNA expression relative to average endogenous BAT expression (n=5).



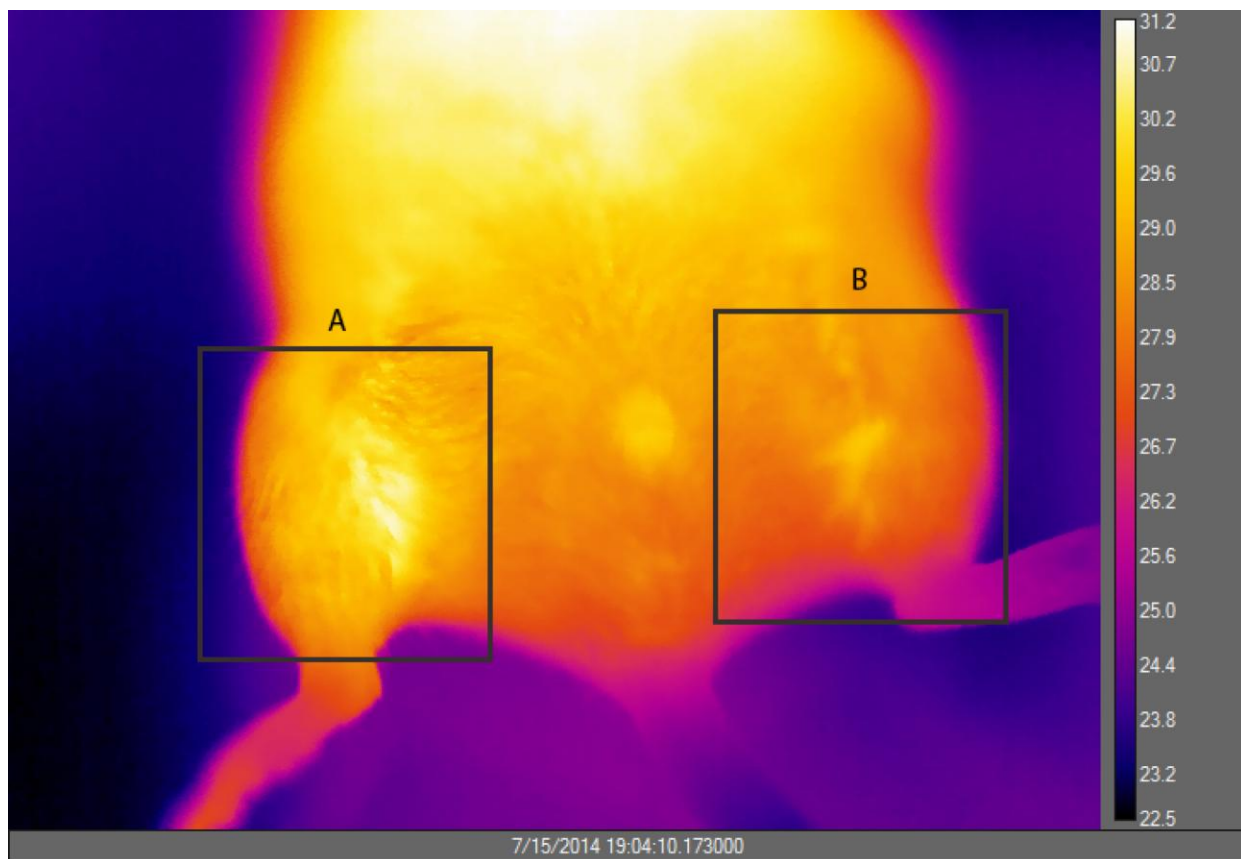
SUPPLEMENTARY DATA

Supplementary Figure 5. WAT-MACT morphology. Two weeks post implantation WAT-MACT were stained with DAPI (blue) and endomucin specific antibodies (red) to highlight the vasculature.



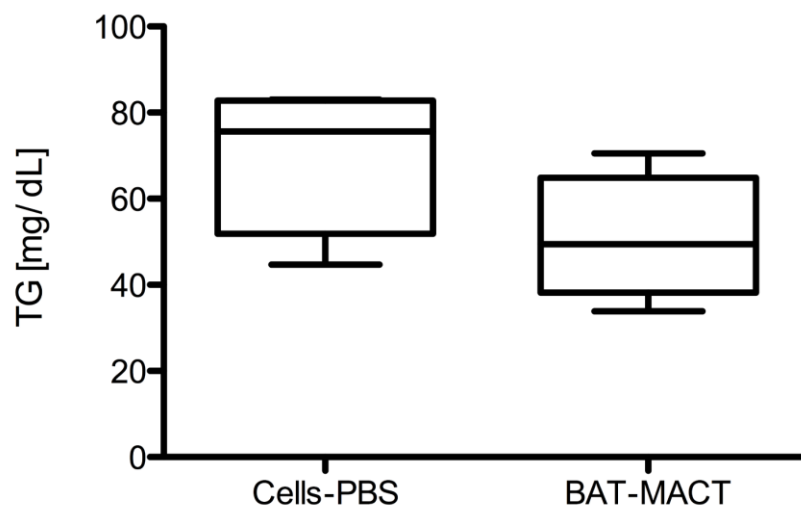
SUPPLEMENTARY DATA

Supplementary Figure 6. Thermograph of BAT-MACT implanted animal. BAT-MACT in area A compared to unaltered inguinal region in area B, 5 days post implantation at room temperature. Max temperature for area: A) 30.86°C B) 29.43°C.



SUPPLEMENTARY DATA

Supplementary Figure 7. Serum triglyceride concentrations of control and BAT-MACT implanted animals. Serum triglycerides concentrations of animals from Fig. 5D.



SUPPLEMENTARY DATA

Supplementary Table 1. Peptide targets for integrins and other adhesion receptors present on stem and progenitor cells identified via RT-PCR, IHC, or flow cytometry.

Acronym	Peptide Sequence	Receptor Target	Protein Source	Reference
bsp-RGD	CGNGEPRGDTYRAY	$\alpha_v\beta_3$	Bone sialoproteina and vitronectin	[1, 2]
P3	CGGVSWFSRHRYSFPAVS	$\alpha_6\beta_1$	Laminin $\alpha 1$ chain	[3, 4]
AG10	CGGNRWHSIYITRFG	$\alpha_6\beta_1$	Laminin $\alpha 1$ chain	[5] [6]
AG32	CGGTWYKIAFQRNRK	$\alpha_6\beta_1$	Laminin $\alpha 1$ chain	[5] [6]
AG73	CGGRKRLQVQLSIRT	Syndecan-1	Laminin $\alpha 1$ chain	[7] [5] [6]
C16	CGGKAFDITYVRLKF	$\alpha_v\beta_3, \alpha_5\beta_1$	Laminin $\gamma 1$ chain	[8] [9]

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