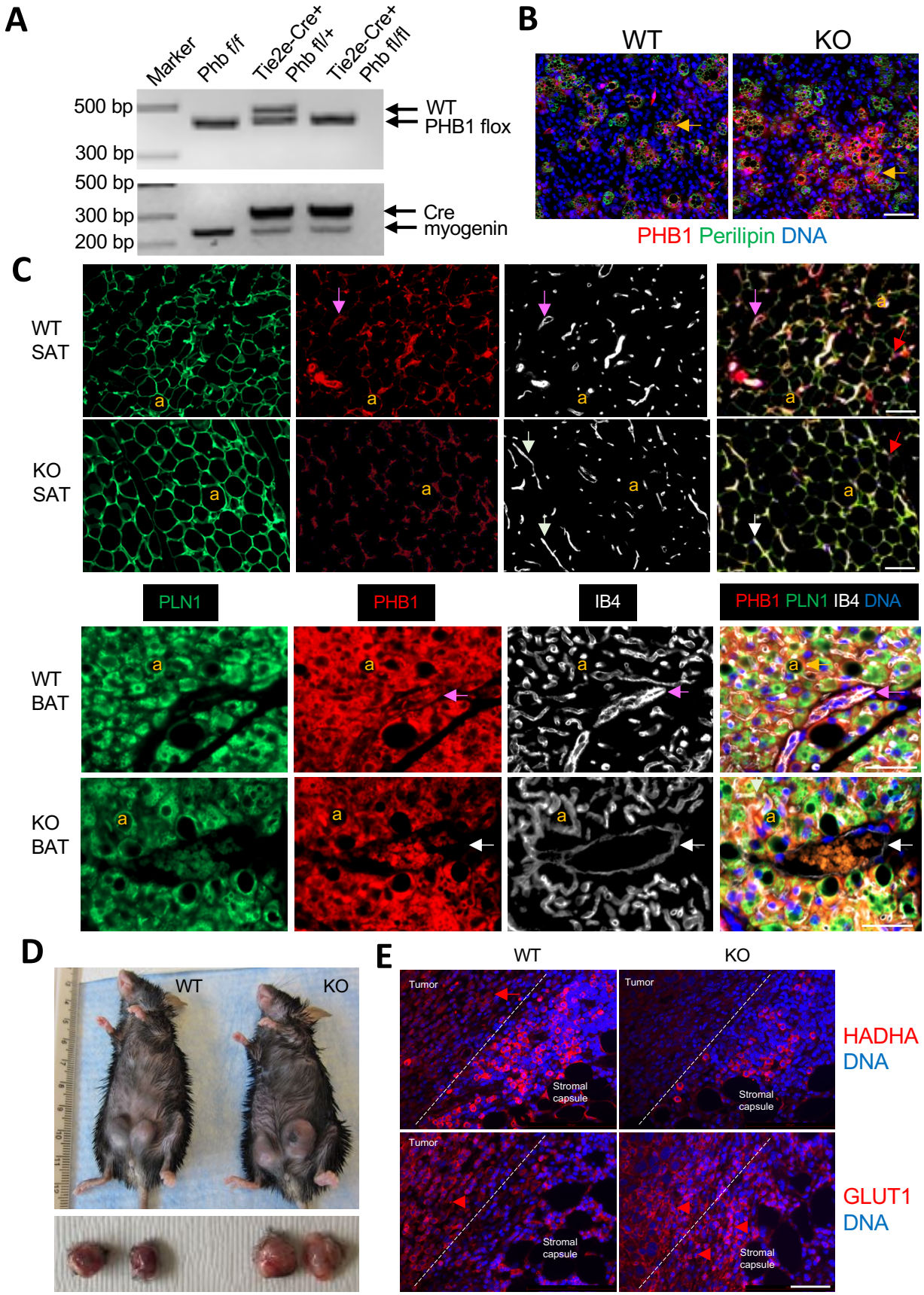

Figure S1 - PHB1 EC KO mice have normal AT and vascularization. *A:* PCR genotyping identifying TIE2e-Cre+; PHB1$^{fl/fl}$ (EC-KO) and control Cre- PHB1$^{fl/fl}$ (WT) littermates. Myogenin PCR: DNA quality control. *B:* IF on MEFs subjected to adipogenesis reveals PHB1 in PLN1+ adipocytes (yellow arrows). *C:* IF on SAT sections reveals PHB1 in IB4+ endothelium of WT SAT and BAT (purple arrows), but not of KO SAT and BAT (white arrows). PLN1+ adipocytes (a) are PHB1+ in WT and KO SAT and BAT. *D:* Comparable orthotopic E0771 tumor growth in WT and PHB1-KO mice. Representative resected tumors are shown below. *E:* IF on sections of tumors from D reveals that cancer cell HADHA expression (arrow) is decreased and GLUT1 expression (arrowhead) in tumor stroma is increased in KO mice. Scale bar: 50 µm.

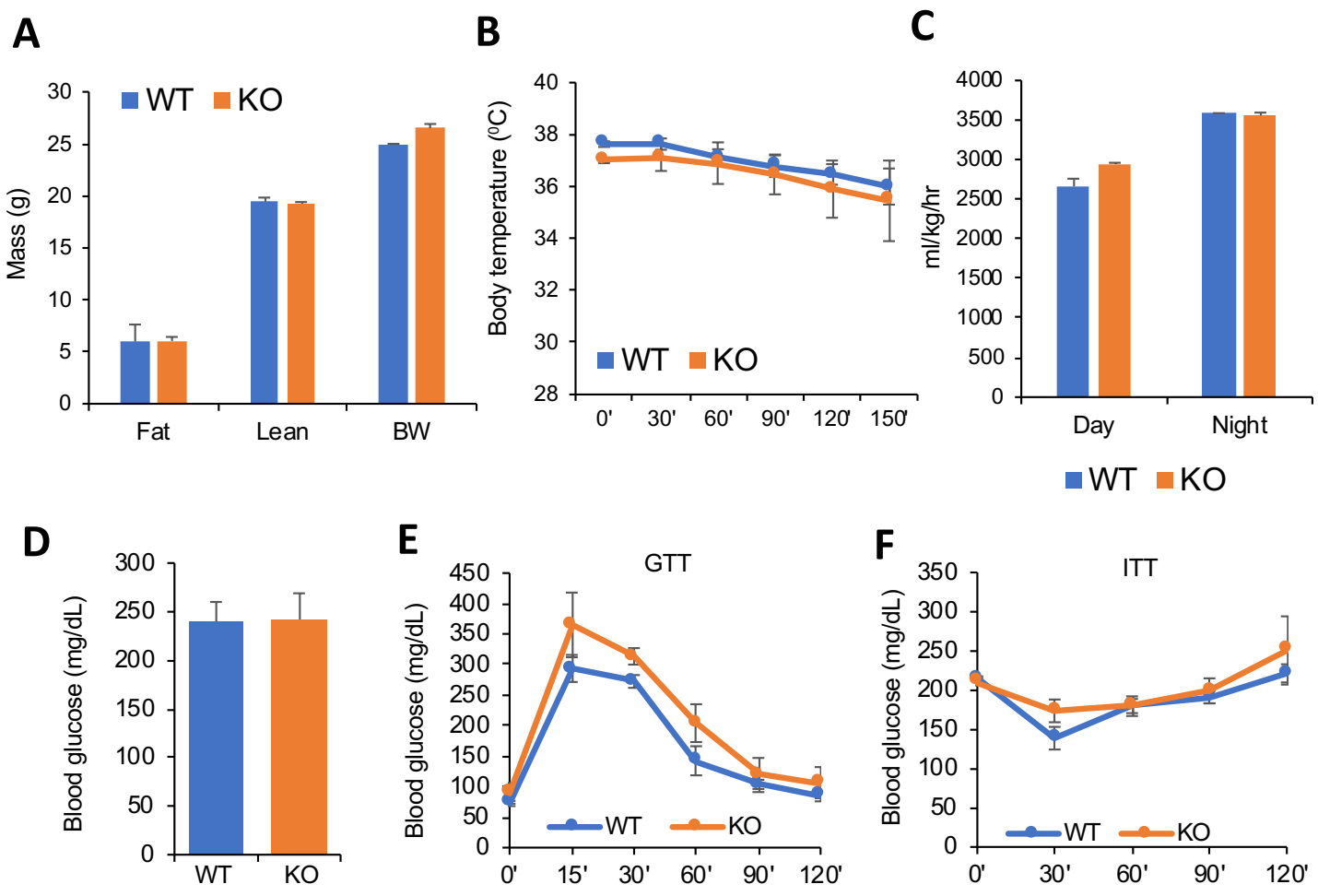

Figure S2- PHB1 EC KO mice have no metabolic phenotype on low-fat diet. For all panels, WT and PHB1 EC-KO female littermates (N=5) were analyzed at 15 weeks of age *A:* EchoMRI analysis reveals no difference. *B:* Body temperature maintenance in mice placed at 4°C is similar. C: Oxygen consumption (VO_2) measured by indirect calorimetry is similar. *D:* Non-fasting glucose concentration in blood is similar. *E:* Glucose tolerance test (GTT). After o/n fasting, mice were injected with glucose (2 g/kg body weight) i.p. and glucose in blood was measured. *F:* Insulin tolerance test (ITT). After 4 hr fasting, mice were injected with insulin (0.6 U/kg body weight) i.p. and glucose in blood was measured. In all panels, plotted are mean ± SEM.

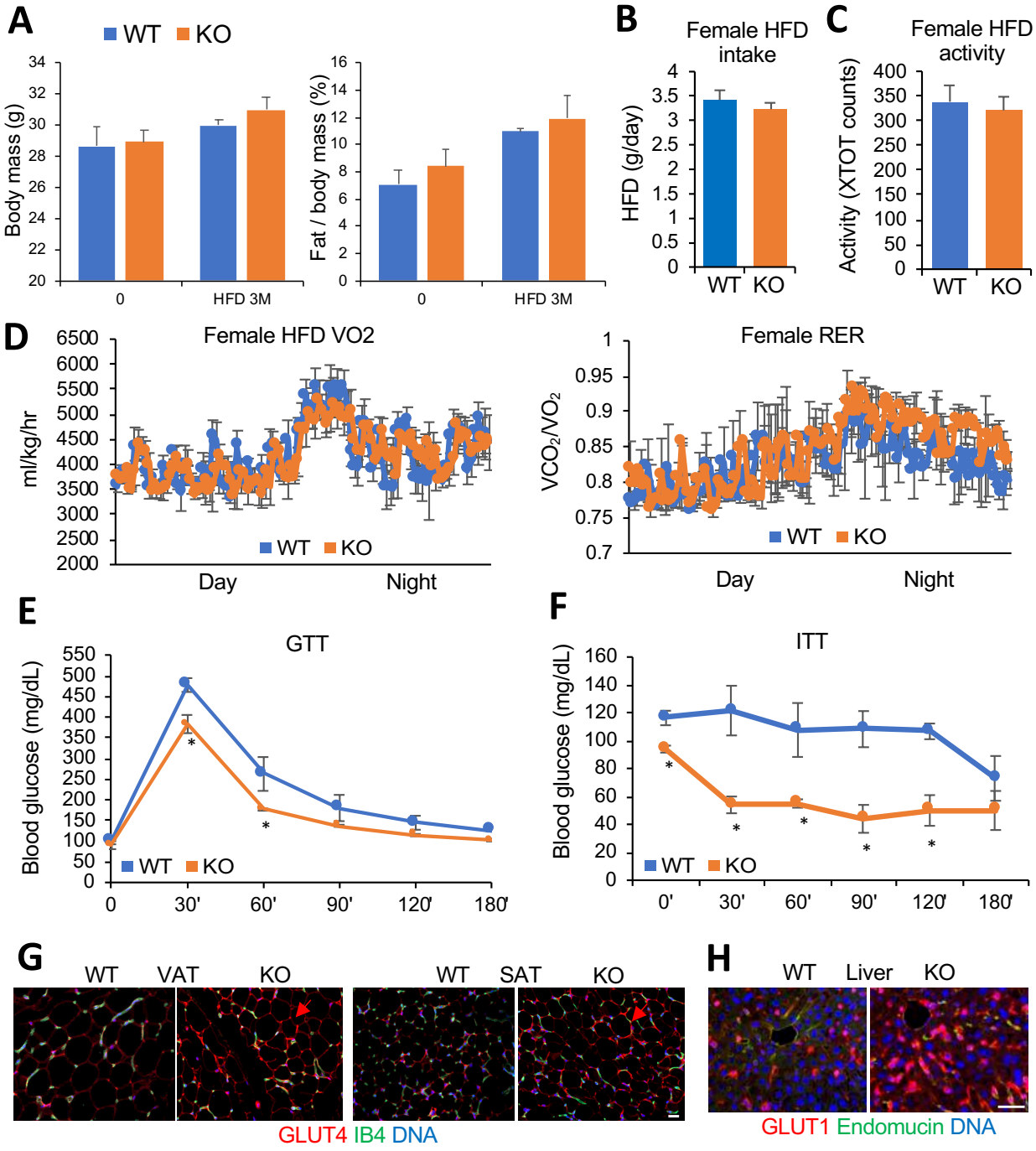

Figure S3- PHB1 EC KO mice have a metabolic phenotype on high-fat diet. For all panels, WT and PHB1 EC-KO littermates (N=5) were analyzed at 60 weeks of age after 3 months on HFD. *A:* EchoMRI analysis showing fat body mass increase of male mice. *B:* HFD consumption in female mice is similar. *C:* Spontaneous locomotor activity in female mice is similar. *D:* Indirect calorimetry data: oxygen consumption (VO_2) and RER (VCO_2/VO_2) show an increase in KO female mice. *E:* GTT in o/n-fasted mice. *F:* ITT in 4 hr-fasted mice. *G:* IF on sections from WT and EC KO mice reveals that GLUT4 expression is increased in VAT and SAT of KO mice. *H:* IF on sections of livers from WT and EC KO mice reveals that GLUT1 expression is increased in hepatocytes of KO mice. Scale bar: 50 µm. In all panels, plotted are mean ± SEM. **P*<0.05 (Student's t-test).

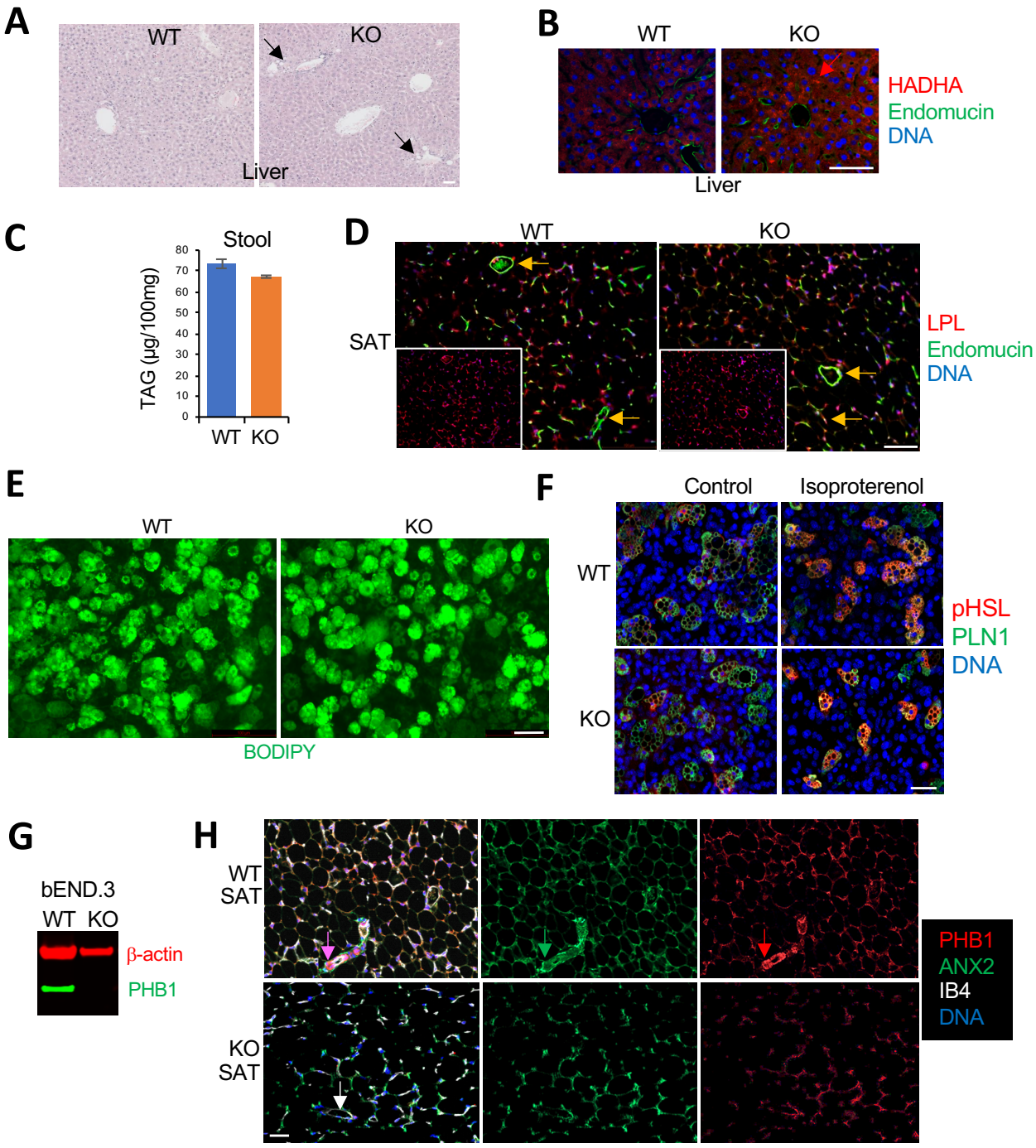

Figure S4- Phenotype of PHB1 EC KO mice. *A: IF* Lipid droplets (arrows) in H/E-stained livers of HFD-fed KO mice. *B:* IF on sections of livers from WT and EC KO mice reveals that HADHA expression is increased (arrow) in hepatocytes of KO mice. *C:* Similar triglyceride concentration in feces of WT and KO mice (N=5). *D:* IF reveals that LPL expression is comparable in the vasculature (arrows) SAT of WT and EC KO mice. *E:* Adipocytes differentiated from MEFs of WT and KO mice uptake BODIPY-C_{16} (2µM) equally well after 30 min. *F:* IF reveals that pHSL expression is comparable in adipocytes differentiated from MEFs of WT and KO mice at baseline and upon lipolysis stimulation with isoproterenol. *G:* Control (WT) and PHB1-KO bEND.3 cells subjected to Western blotting with PHB1 antibodies; β-actin: loading control. *H:* IF reveals that ANX2 expression (purple arrow) is reduced (white arrow) in the IB4+ SAT endothelium (white) of PHB1-EC KO mice. Scale bar: 50 µm.

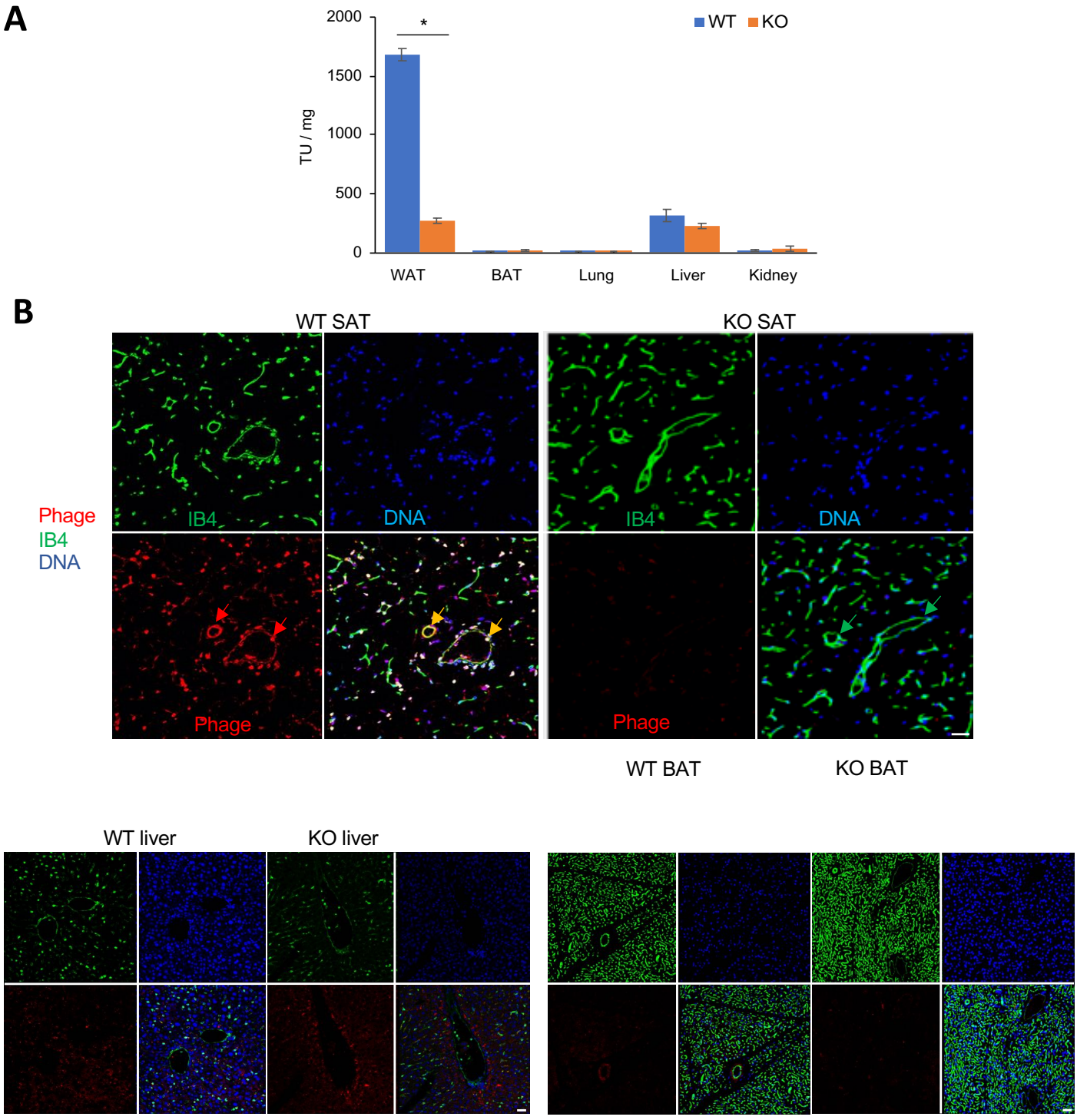

Figure S5- PHB1-binding peptide homing to AT. *A:* Homing of phage displaying KGGRAKD peptide upon administration of $5x10^{10}$ phage transforming units (TU) into mice. After 1 hr of circulation, phage accumulates in SAT (but not in BAT) of WT mice compared to PHB1 EC-KO littermates; there is no difference for control organs. Error bars: SD **P<0.001* (Student's t-test); N=3 phage TU recovery quantifications. *B:* Tissues of mice injected in (A) subjected to isolectin B4 (green) and anti-phage IF (red). Yellow arrows: phage signal in the endothelium of WT mice but not EC-KO littermates. Green arrows: phage-negative EC. Arrowheads: nonspecific liver trapping indicating equal phage injection. Individual channels are shown below. Scale bar: 50 μm. Phage display assays were performed as described (9) by K91 E. coli infection and quantification by colony counting (A) and by IF with Sigma B7786 anti-Fd bacteriophage antibody (B).