Fig. S1. Related to Figure 2. Paxillin knockdown controls vascular network formation in vivo. A) Schematic of Matrigel plug implant and experimental timeline. B) Graph showing endothelial cell migration into Matrigel implants treated with control or paxillin siRNA analyzed using immunohistochemical fluorescein-conA image analysis as measured in 3 random 50x50 μm fields per gel (n=4, **, $p<0.01$). C) Graph showing quantification of total cell migration into Matrigel implant treated with control or paxillin siRNA (n=7). D) Corresponding confocal micrographs to Fig. 2D, G of Matrigel implant treated with control or paxillin siRNA stained with DAPI. Scale bar; 50μm. E, F) Graphs showing number of CD45+ immune cells (E) and SMA+/CD31- fibroblasts (F) migrating into Matrigel implant treated with control or paxillin siRNA (n=4, *, $p<0.05$). Data are represented as mean +/- s.e.m.

Fig. S2. Related to Figures 4 and 7. Vinculin and zyxin knockdown do not affect NRP2 expression. A) Immunoblots showing paxillin, NRP2, vinculin, zyxin and GAPDH expression in HUVE cells treated with vinculin or zyxin siRNA. B) Graph showing mRNA levels of paxillin, NRP2, vinculin and zyxin in HUVE cells treated with vinculin or zyxin siRNA (***, $p<0.001$, *, $p<0.05$). C) Graph showing the number of migrating HUVE cells transfected with control, vinculin or zyxin siRNA normalized to control siRNA-transfected cells in Transwell migration assay. The migratory stimulus is 5% serum EGM2. D) Immunoblots showing NRP2 and GAPDH expression in HUVE cells treated with NRP2 siRNA or NRP2 DNA. E) Graph showing quantification of immunoblots of NRP2 in HUVE cells treated with NRP2 siRNA or DNA (***, $p<0.001$, *, $p<0.05$). F) Graph showing mRNA level of NRP2 in HUVE cells treated with NRP2 siRNA or DNA (**, $p<0.01$, *, $p<0.05$). G) Immunoblots showing GFP, NRP2 and GAPDH expression in HUVE cells transfected with paxillin siRNA with or without GFP-paxN or GFP-paxC DNA. H) Graph showing the number of migrating HUVE cells transfected with paxillin siRNA with or without GFP-paxN or GFP-paxC DNA normalized to paxillin siRNA-treated cells. (n=3, *, $p<0.05$). Data are represented as mean +/- s.e.m.

Fig. S3. Related to Figure 5. NRP2 knockdown controls vascular network formation in vivo. A) Confocal micrographs showing NRP2 expression (top) and DAPI (bottom) in control or NRP2 siRNA treated implants. Scale bar; 50μm. B) Graph showing NRP2 protein levels quantified via immunohistochemical image analysis where NRP2 colocalized to CD31+ cells as measured in 3 random 50x50 μm fields per gel (n=5, *, $p<0.05$). C) Graph showing mRNA level of NRP2 in the infiltrated cells in the implanted Matrigel (n=8, *, $p<0.05$). D) Quantification of total cell migration into Matrigel implant treated with control or NRP2 siRNA as measured in 3 random 50x50 μm fields per gel (n=4). E) Quantification of endothelial cell migration into Matrigel implant treated with control or NRP2 siRNA via immunohistochemical fluorescein-conA image analysis as measured in 3 random 50x50 μm fields per gel (n=3, **, $p<0.01$). F) Confocal micrographs showing VEGFR2 expression (top), CD31-stained blood vessels (bottom) in control or paxillin siRNA treated implants. Scale bar; 50μm. G) Quantification of VEGFR2 expression in Matrigel implant treated with control or paxillin siRNA via immunohistochemical analysis of VEGFR2 colocalized to CD31+ cells as measured in 3 random 50x50 μm fields per gel (n=4). H) Graph showing mRNA level of VEGFR2 in the infiltrated cells in the implanted Matrigel (n=8). Data are represented as mean +/- s.e.m.

Fig. S4. Related to Figure 6. LLC factors increase vascular network formation in vivo. A) Schematic of Matrigel plug implant (exploded view) and experimental timeline. B) H&E stained micrographs showing total cell migration from C57BL/6 mouse skin into implanted Matrigel with or without LLC factors. Scale bar; 50μm (top). Corresponding confocal micrographs to Fig. 6D showing CD31-stained

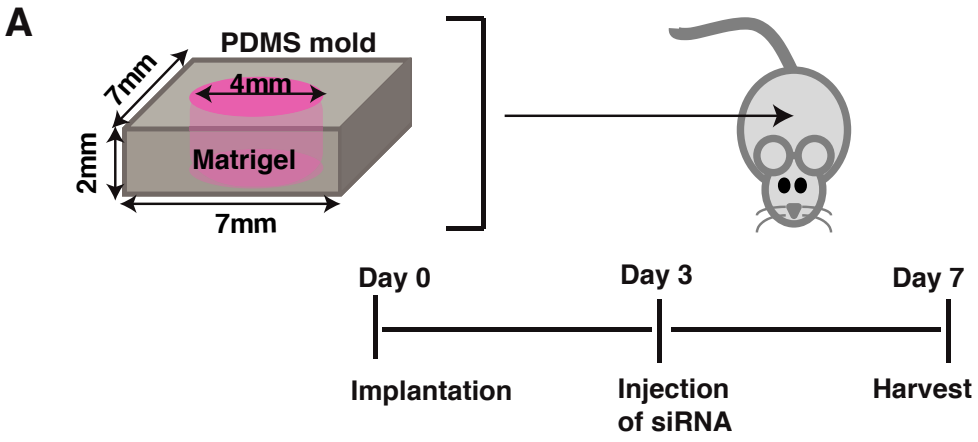
endothelial cells (middle) and DAPI stained nuclei (bottom) in the implanted Matrigel with or without LLC factors. Scale bar; 50µm. C) Quantification of vessel density in Matrigel implant with or without LLC factors via immunohistochemical CD31 image analysis as measured in 3 random 50x50um fields per tissue section (n=9, *, p<0.001). D) Graph showing migration distance of endothelial cells into Matrigel implant with or without LLC factors (n=7, *, p<0.001). E) Quantification of total cell migration into implant as measured in 3 random 50x50um fields per tissue section (n=4, *, p<0.001). F) Quantification of endothelial cell migration into Matrigel implant with or without LLC factors via immunohistochemical fluorescein-conA image analysis as measured in 3 random 50x50um fields per tissue section (n=4, *, p<0.001). Data are represented as mean +/- s.e.m.

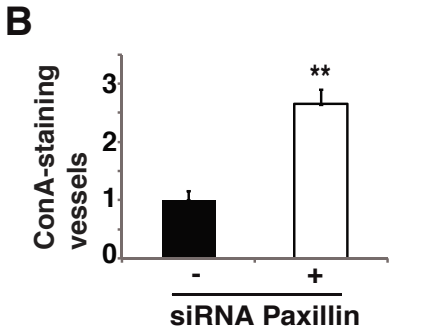
Table S1. Target sequences for human and mouse siRNA.

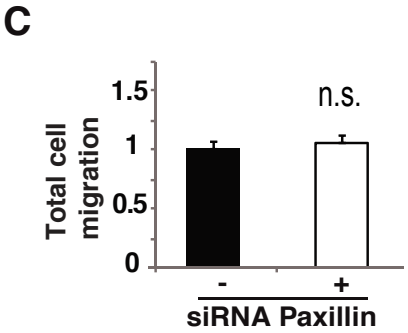
Human paxillin #1 (target sequence is in paxillin C-terminus)	5’-GUGUGGAGCCUUCUUUGGU-3’
Human paxillin #2(target sequence is in paxillin N-terminus)	5'-CCACACAUACCAGGAGAUU-3'
Human NRP2	5’-CCAGAAGAUUGUCCUCAAC-3’
Human vinculin	5’-GGCAUAGAGGAAGCUUUAA-3’
Human zyxin	5’-CUGGACAUGGAGUUGGACCUGAGGC-3’
Mouse paxillin	5'-GAGCCCUCACCUACCGUCAU-3’
Mouse NRP2	5’-GAGCAGAGAGAAAGAAUAA-3’

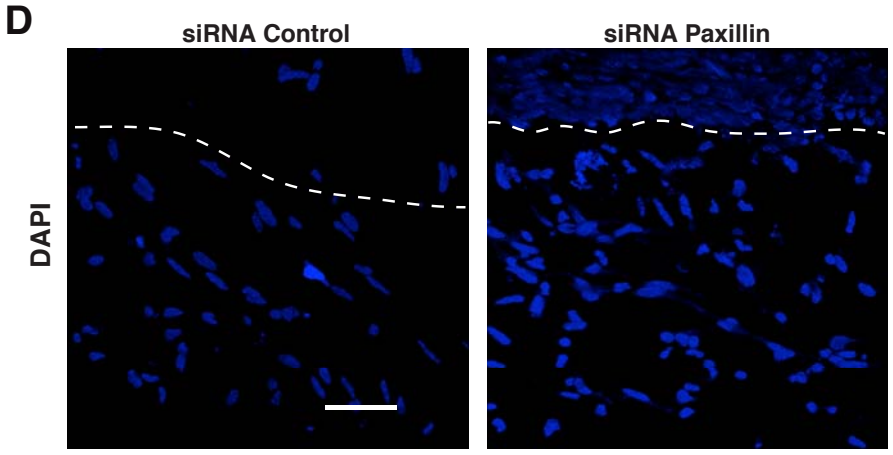
Table S2. Sequences for primers for qRT-PCR.

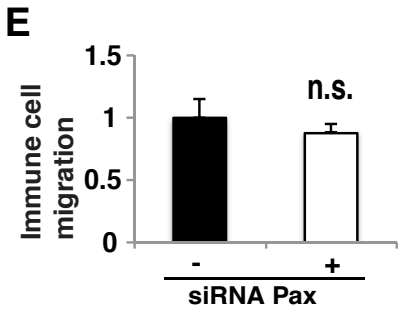
	Forward	Reverse
Human paxillin	5’-CTGGCGGACTTGGAGTCTAC-3’	5’- CTCCTCCGACAAGAACACAGG-3’
Human NRP2	5’- CCAGAAGAUUGUCCUCAAC-3’	5’-GUUGAGGACAAUCUUCUGG-3’
Human vinculin	5’- CTCGTCCGGGTTGGAAAAGAG-3’	5’- AGTAAGGGTCTGACTGAAGCAT-3’
Human zyxin	5’-TCTCCCGCGATCTCCGTTT-3’	5’-CCGGAAGGGATTCACTTTGGG-3’
Human β2-micro-globulin	5’-GAATGGAGAGAGAATTGAAAAAGTGGAGCA-3’	5’-CAATCCAAATGCGGCATCTTCAAAC-3’
Mouse paxillin	5’-GGCATCCCAGAAAATAACACTCC-3’	5’- GCCCTGCATCTTGAAATCTGA-3’
Mouse NRP2	5’- GCTGGCTACATCACTTCCCC-3’	5’-CAATCCACTCACAGTTCTGGTG-3’
Mouse VEGFR2	5’-GCCCTGCCTGTGGTCTCACTAC-3’	5’-CAAAGCATTGCCCATTCGAT-3’
Mouse cyclophilin	5’-CAGACGCCACTGTCGCTTT-3’	5’-TGTCTTTGGAACTTTGTCTGCAA -3’

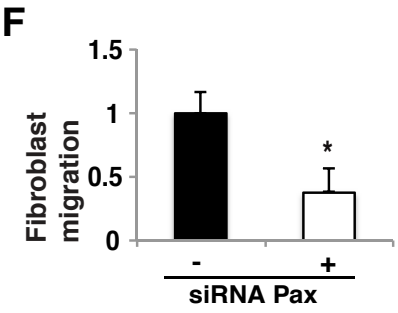




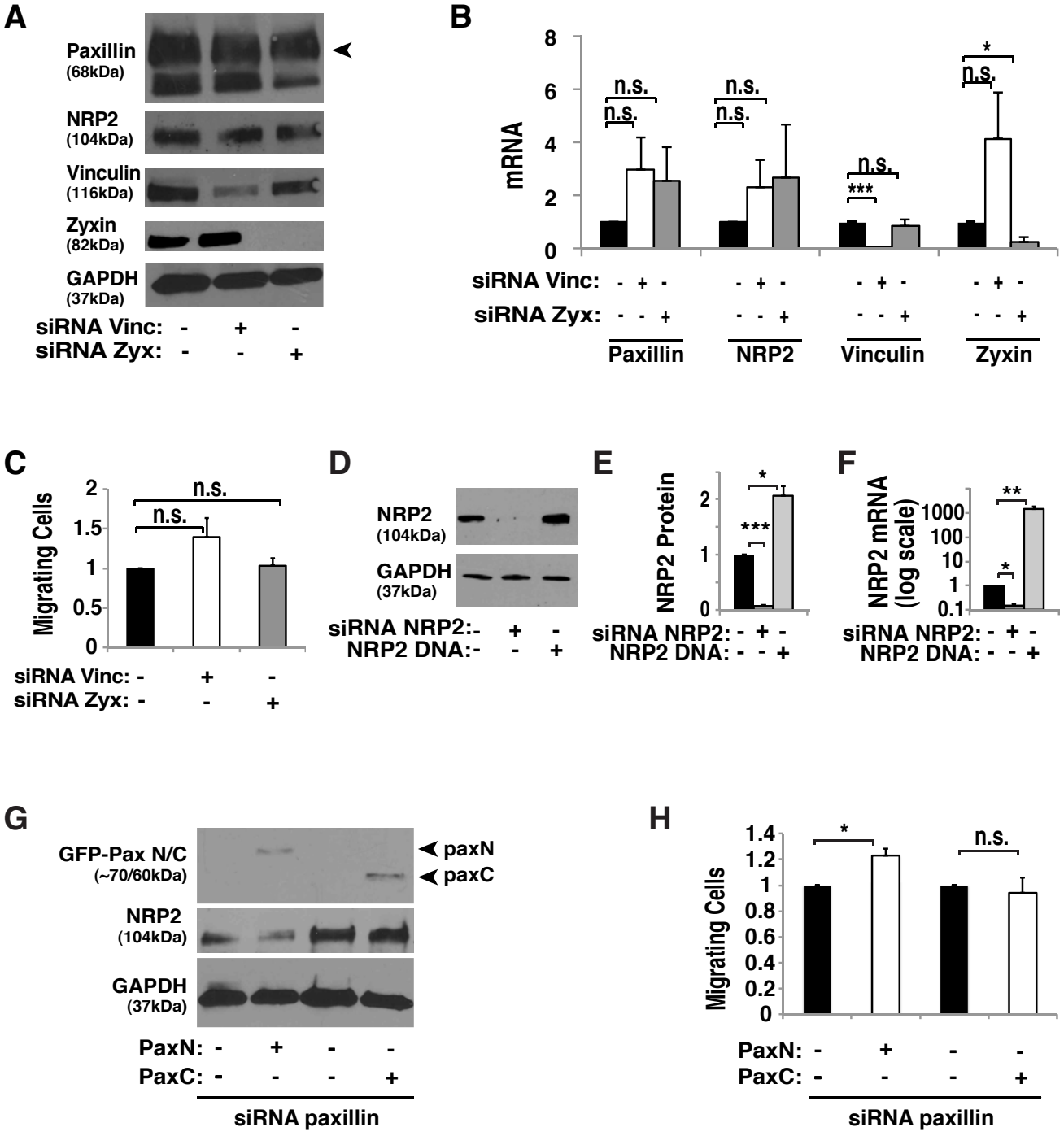




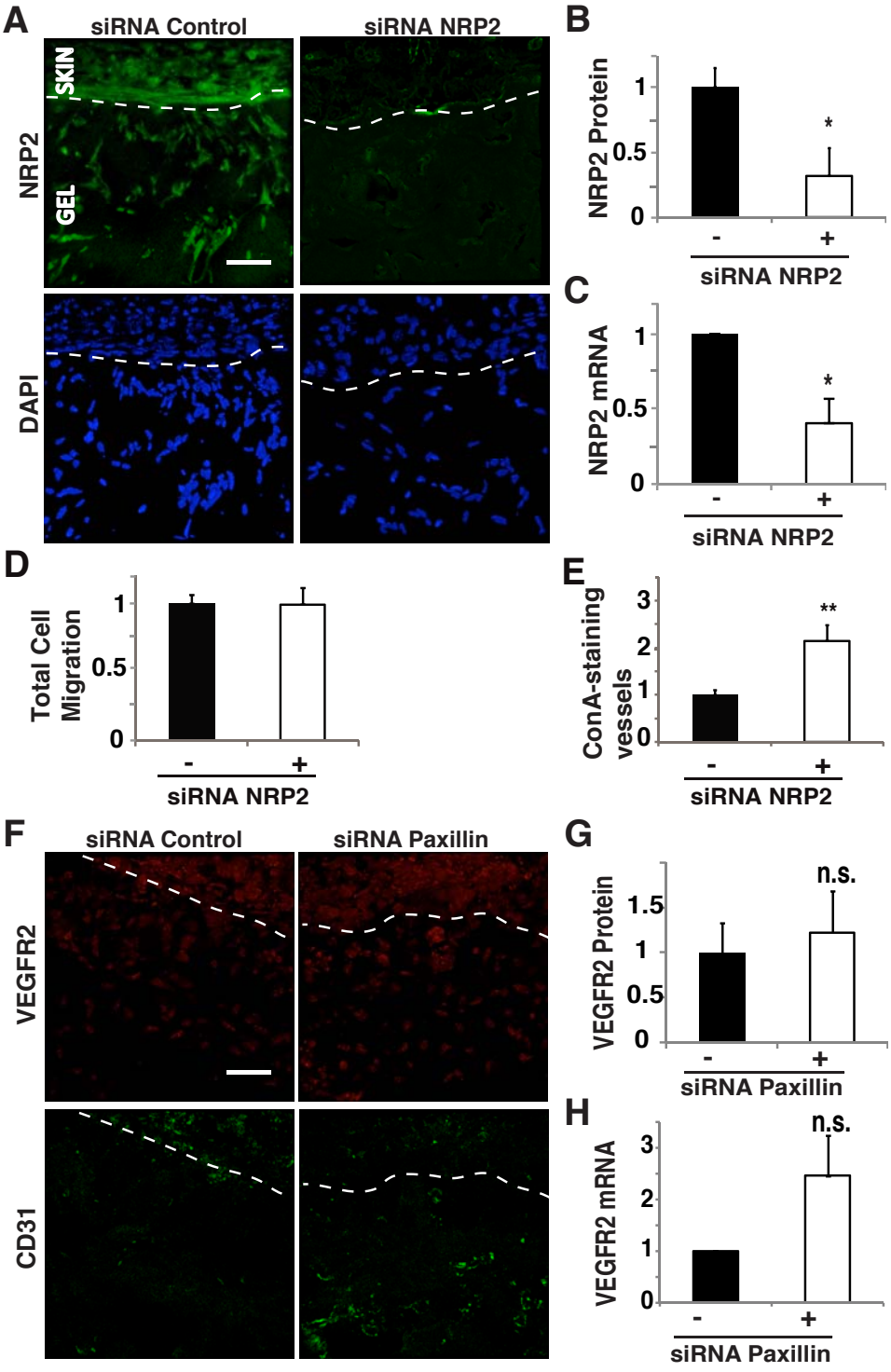




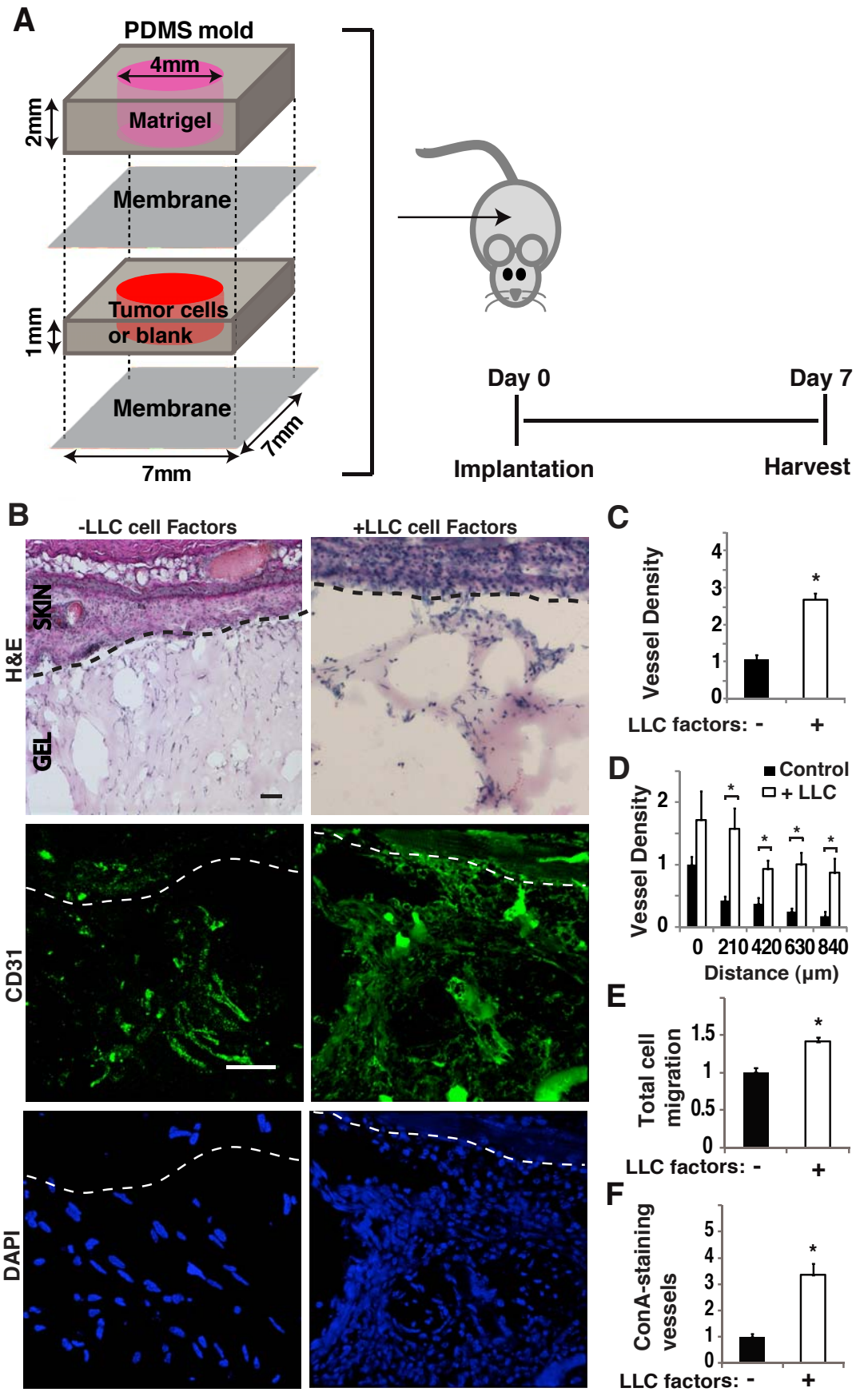
Supplementary Fig. S1



Supplementary Fig. S2



Supplementary Fig. S3



Supplementary Fig. S4