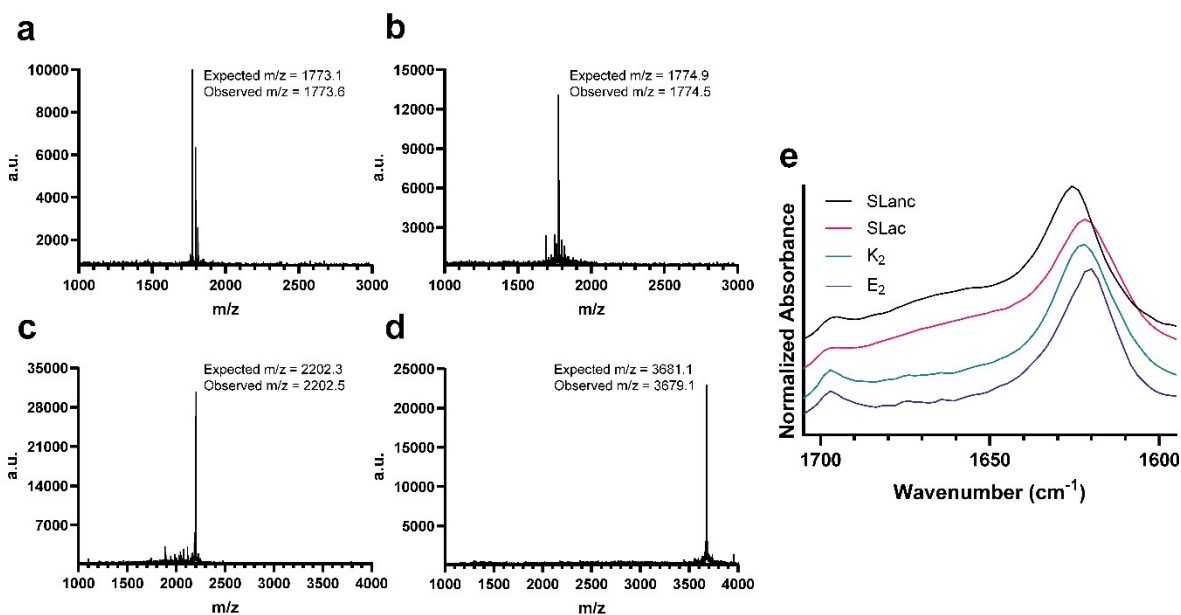


Supplementary Information

Supplementary Tables

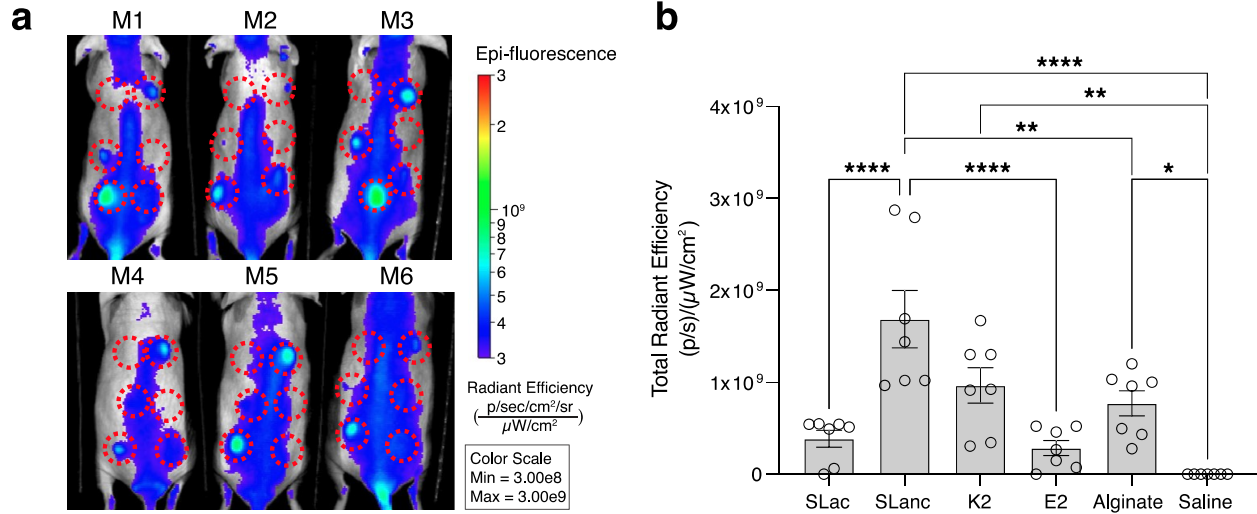
Supplementary Table 1. List of MDPs used.

Name	Sequence	Peptide Domains
K ₂	Ac-KKSLSLSLSLSLSLKK-CONH ₂	= charged = amphiphilic = MMP-2 cleavable = adhesion = VEGF mimic
E ₂	Ac-EESSLSLSLSLSLSL-EE-CONH ₂	
SLac	Ac-KSLSLSLRGSLSLSLKGRGDS-CONH ₂	
SLanc	Ac-KSLSLSLRGSLSLSLKGLTWQELYQLKYKGI-CONH ₂	

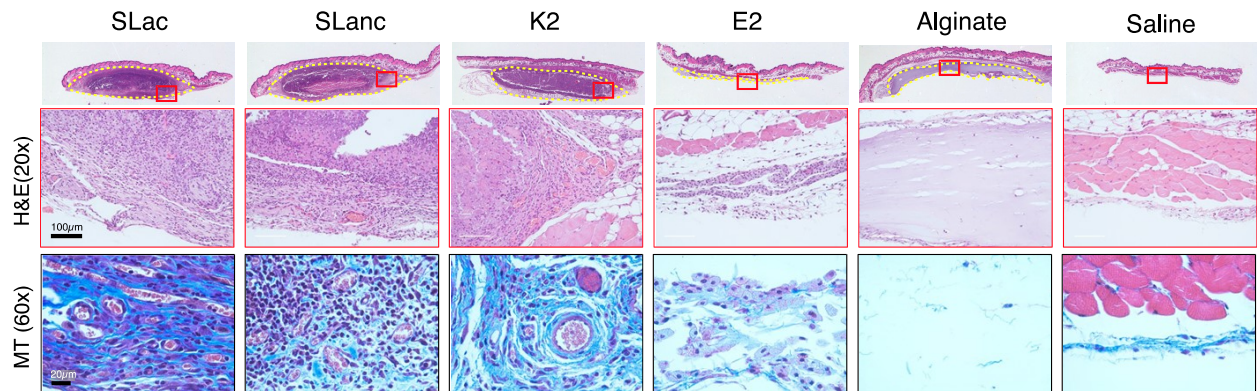


Supplementary Figure 1. MALDI-TOF spectra of a) K₂, b) E₂, c) SLac, d) SLanc, and e) FTIR spectra of all four peptides.

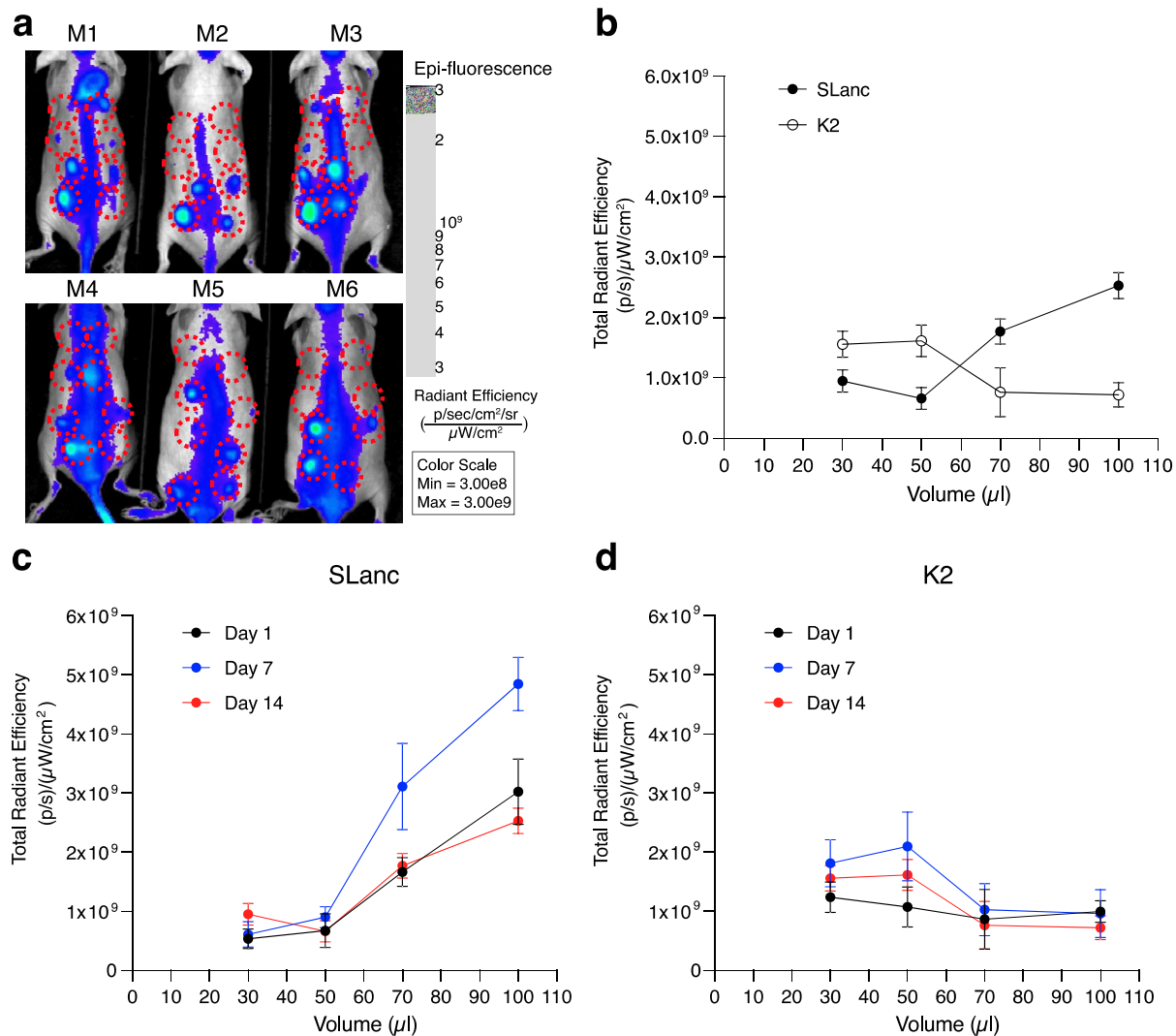
Supplementary Figures



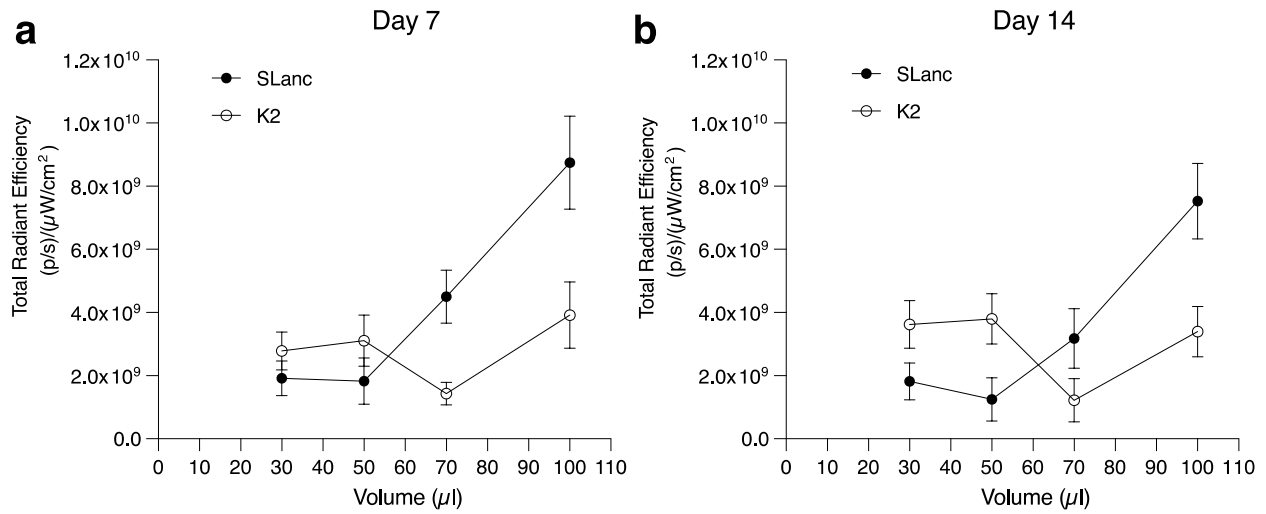
Supplementary Figure 2. a) IVIS imaging of 6 different fomulations (Left; Saline, SLac, SLanc, Right: K2, E2, Alginate) after 14 days of bolus injections. **b)** Quantification of florescence intensity at day 14. One-way ANOVA with Bonferroni correction ($****P < 0.0001$, $***P < 0.0002$, $**P < 0.002$, $*P < 0.033$).



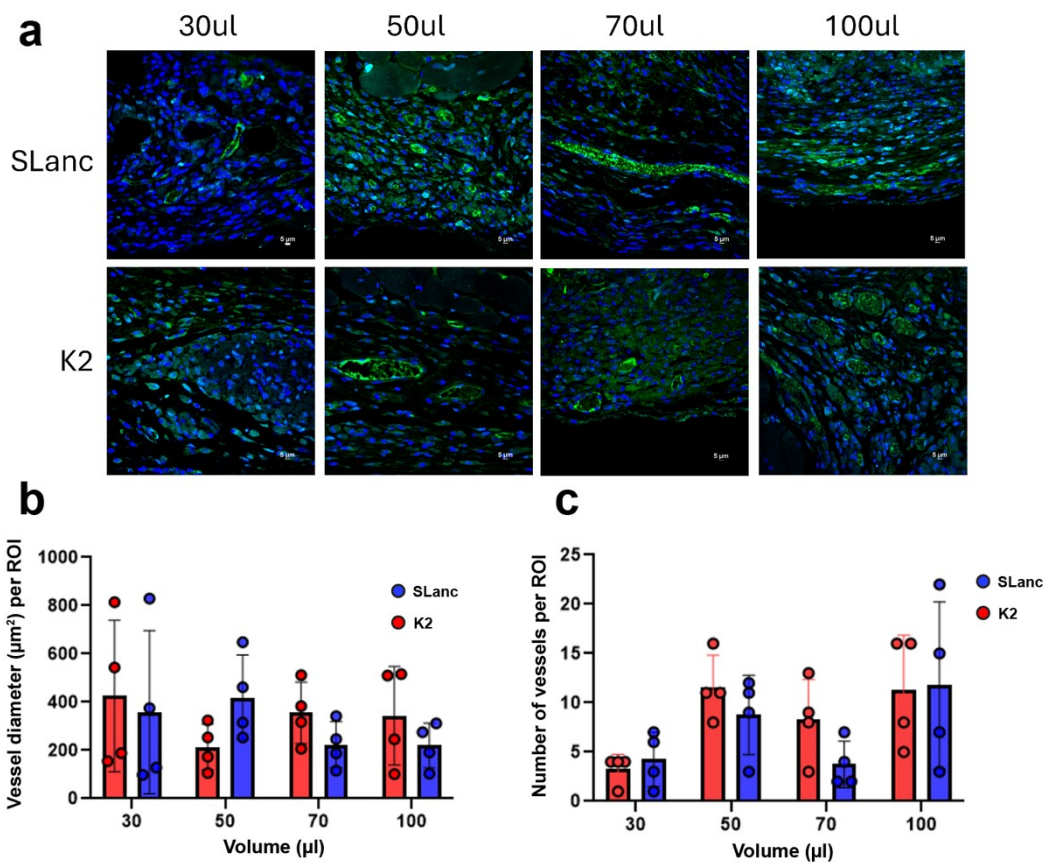
Supplementary Figure 3. Histology analysis of 6 different fomulations at day 7; H&E staining (Top) and Masson's trichrome staining (Bottom).



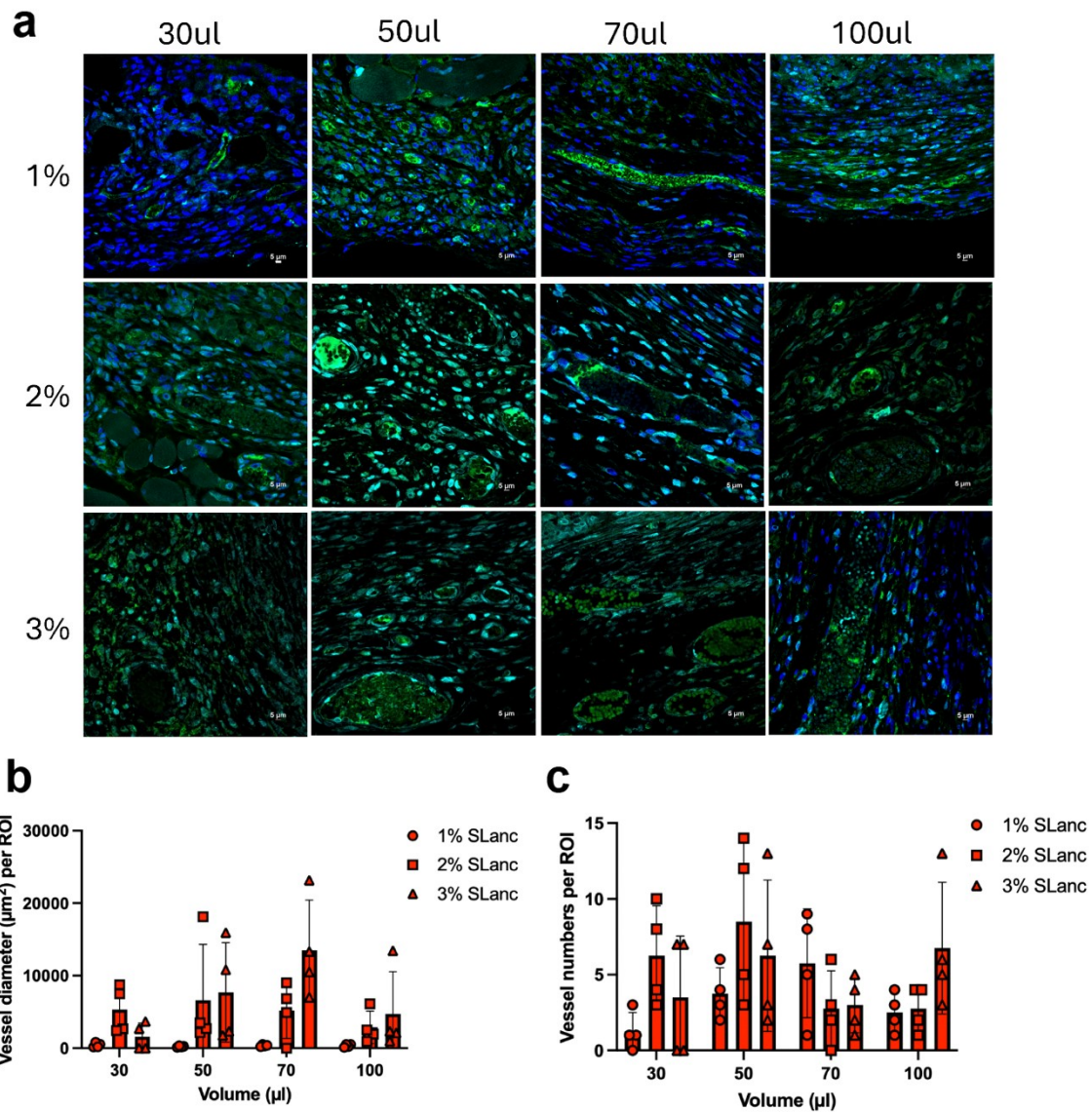
Supplementary Figure 4. a) IVIS imaging of SLanc and K2 with different bolus volume (Left; SLanc, Right; K2) after 14 days of bolus injections. **b)** Quantification of fluorescence intensity at day 14. **c-d)** Quantification of fluorescence intensity over time; **c)** SLanc and **d)** K2 at day 1, 7, and 14.



Supplementary Figure 5. IVIS analysis at day 7 **(a)** and day 14 **(b)** after SLanc and K2 bolus injections. AngioSense 680 probe was used to determine angiogenesis levels.



Supplementary Figure 6. a) Immunofluorescence microscopy of SLanc and K2 pro-angiogenic peptides after 14 days in subcutaneous space demonstrating presence of CD31 positive endothelial cells (green) with nestin (light blue), and DAPI (dark blue). Scale bar = 5 μm. **b-c)** Ex-vivo quantification of blood vessel diameter **(b)** and number **(c)** between groups after 14 days.



Supplementary Figure 7. a) Immunofluorescence microscopy of SLanc at 1, 2, and 3% concentrations after 14 days in subcutaneous space demonstrating presence of CD31 positive endothelial cells (green) with nestin (light blue), and DAPI (dark blue). Scale bar = 5 μm . **b-c)** Ex-vivo quantification of blood vessel diameter (**b**) and number (**c**) between SLanc groups at different concentrations after 14 days.