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ADVANCED HEALTHCARE MATERIALS

Supporting Information

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Engineering Controlled Peritumoral Inflammation to Constrain Brain Tumor Growth

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Engineering Peritumoral Inflammation to Constrain Brain Tumors

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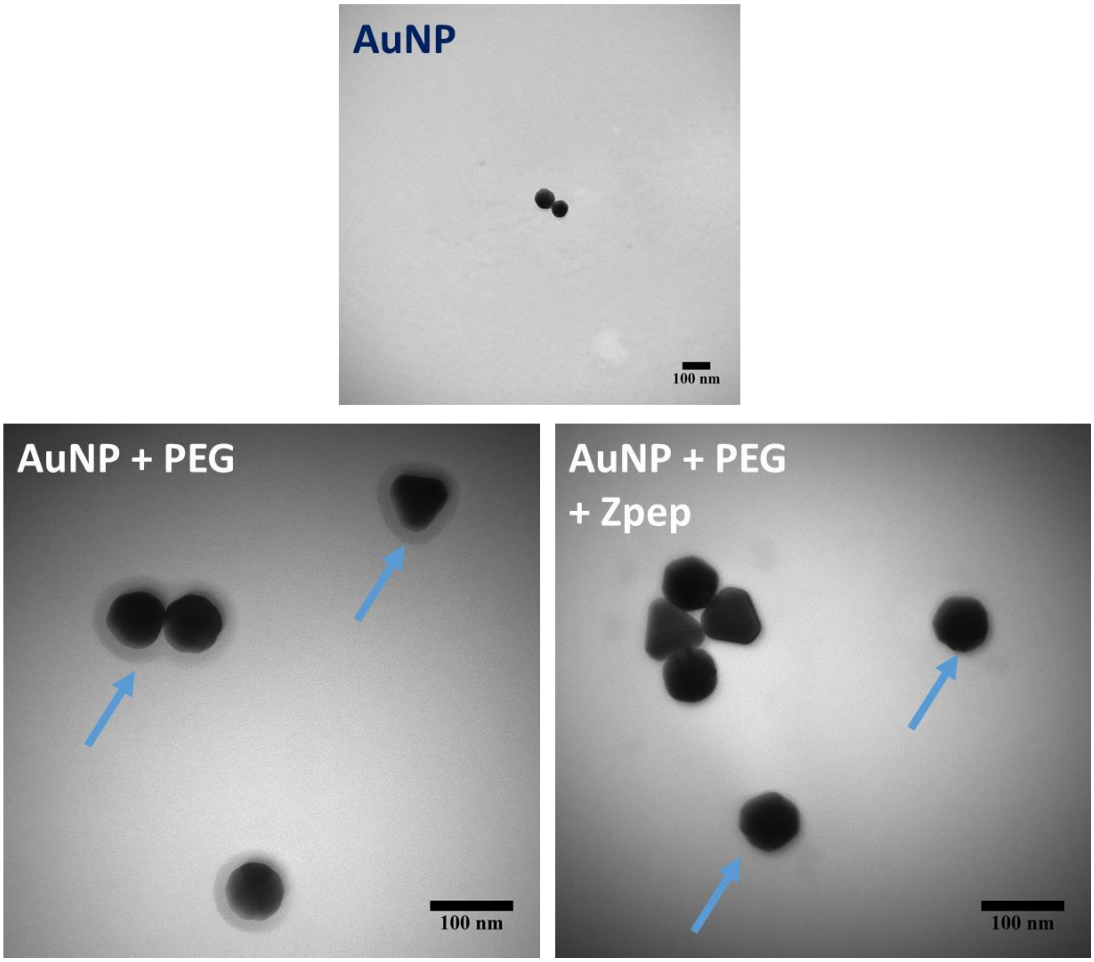
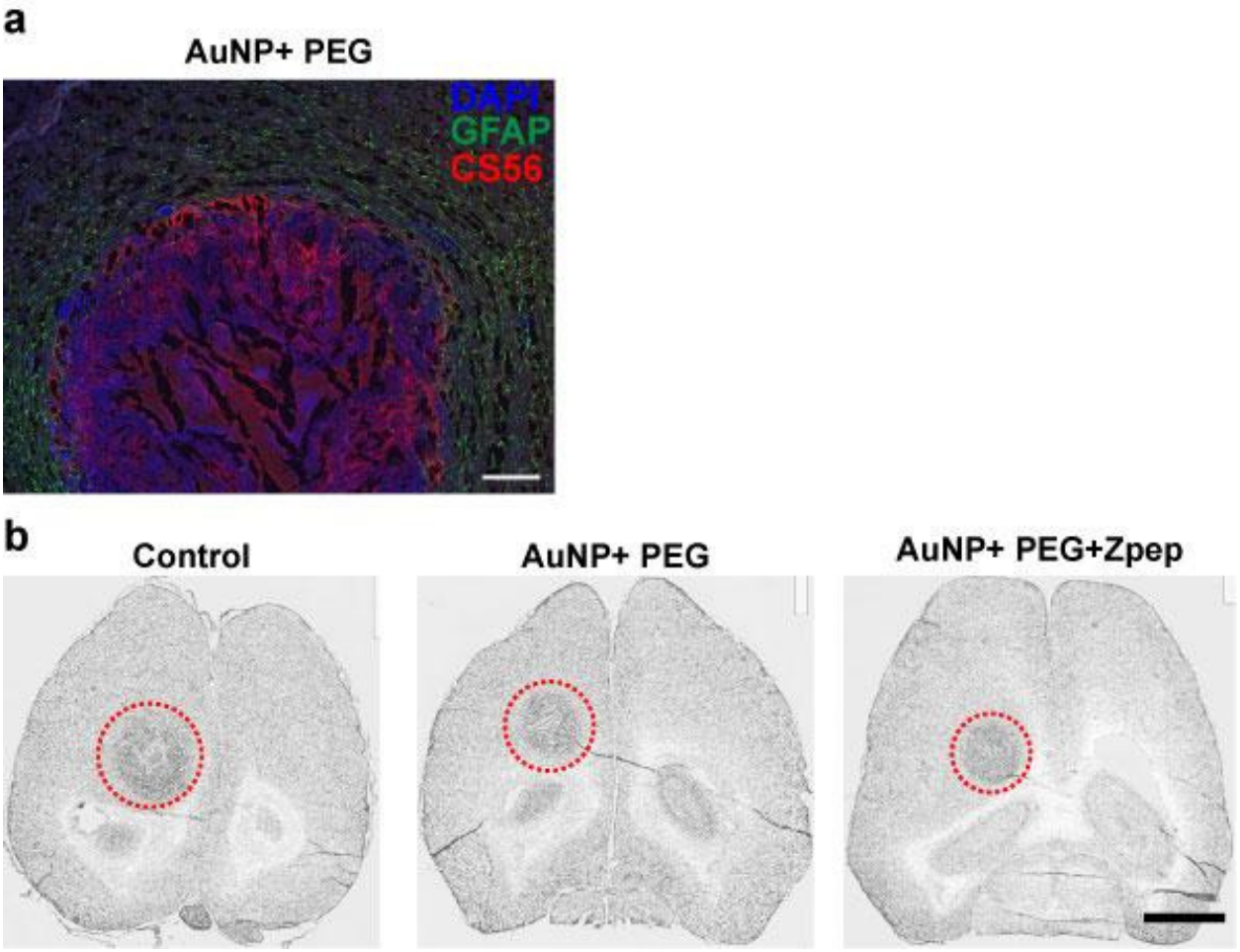
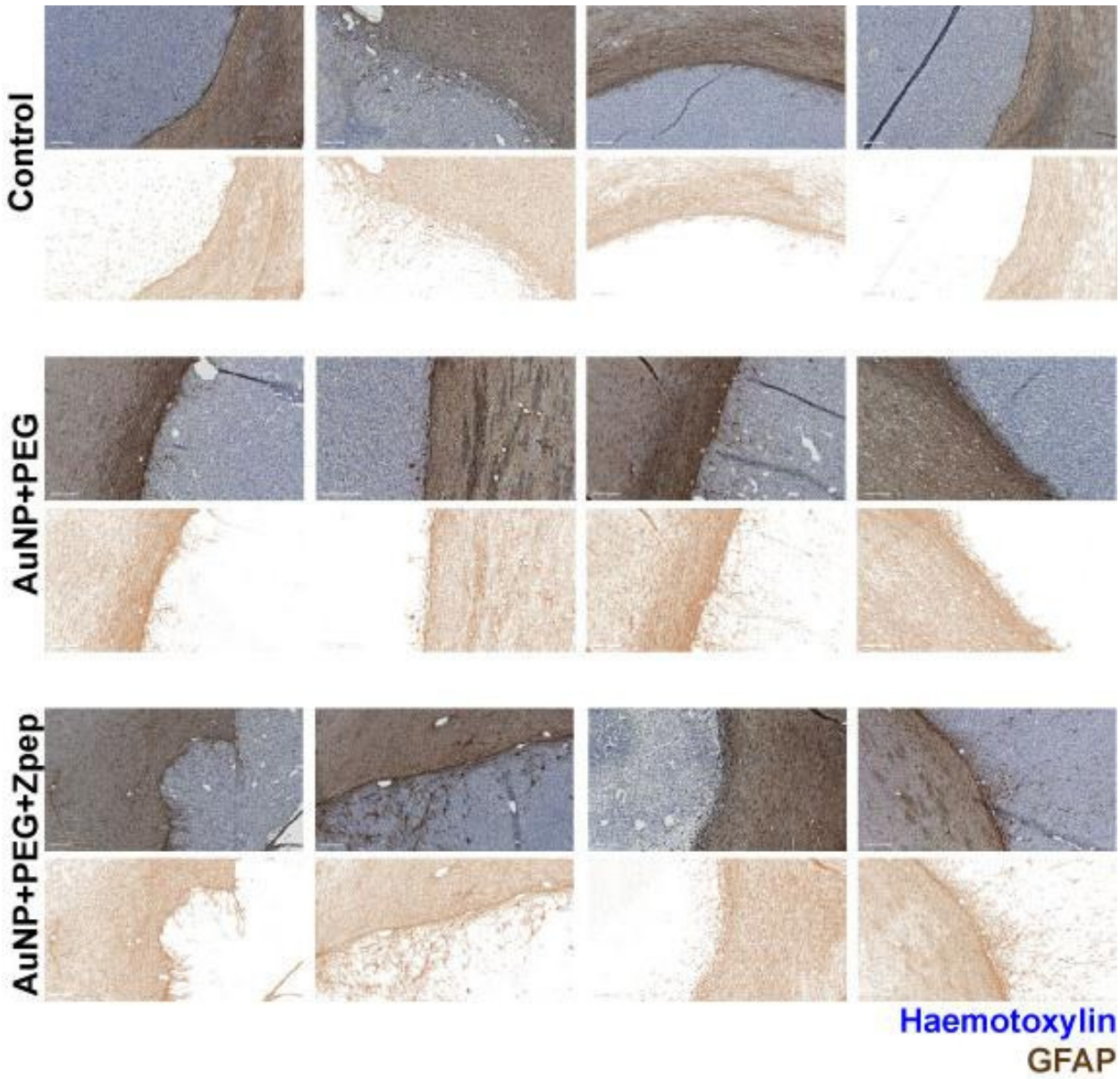


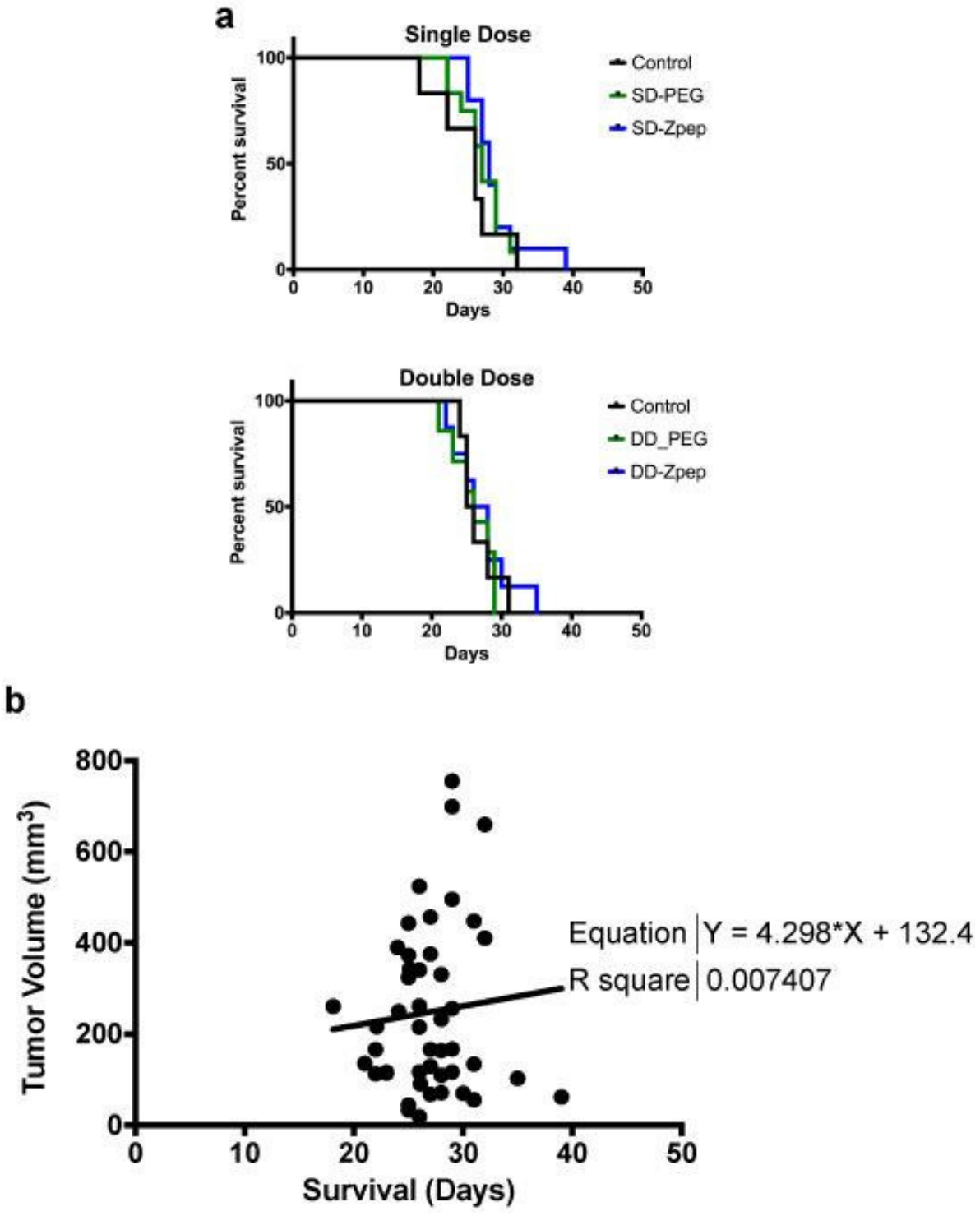
SI Figure 1| TEM images of Zpep-bearing gold nanoparticles. The TEM images demonstrate the conjugation of the PEG and the peptide to the nanoparticles (arrows point to the halos around particles). The images also reflect the results seen in the DLS data, where the peptide + PEG conjugated particles showed a slightly smaller size than the particles conjugated with PEG alone.



SI Figure 2| Zpep-bearing gold nanoparticles constrain tumors in vivo. (a,b) In vivo administration of AuNPs. F98 glioma-bearing Fischer rats were injected intravenously with AuNPs at 6 days post tumor inoculation (DPI) and sacrificed at 20 DPI. Tissue sections (a) from animals bearing F98 tumors and receiving only PEG-bearing AuNPs display low astrocyte activation (GFAP staining) and low CSPG production (CS56 staining). (b) Whole-slide scans showing that animals receiving Zpep bearing AuNPs had smaller and more constrained tumors. Tumors are outlined in red dotted circle. Constrainment is determined as a qualitative assessment of how closely packed tumor cells are. Scale bar is 100 µm in (a) and 2 mm in (b).



SI Figure 3| Astrocyte activation in AuNP treated animals. Astrocyte activation at the border between normal brain tissue and the tumor mass is shown. Individual color micrographs represent a unique animal. The pseudo-colored brown channel image below each color micrograph shows astrocyte activation as assessed by GFAP reactivity. While activated astrocytes are present in all groups, Zpep treated animals show activation of astrocytes both within and outside the tumor mass, with denser GFAP staining in comparison to other groups. Scale bar is 200 µm.



SI Figure 4| Smaller tumors do not extend survival. (a) Kaplan-Maier survival curves of single and double dosed animals bearing U87 tumors. No significant improvement in survival is noted upon AuNP administration. (b) Tumor volume does not correlate with survival. Tumor volume from all animals in the study for the five groups is plotted as a function of survival. Linear regression (straight line and corresponding equation and correlation coefficient) shows that there is no significant correlation between volume and survival.