Supplementary Information for

Interior engineering of a viral nanoparticle and its tumor homing properties

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Supplementary Figures

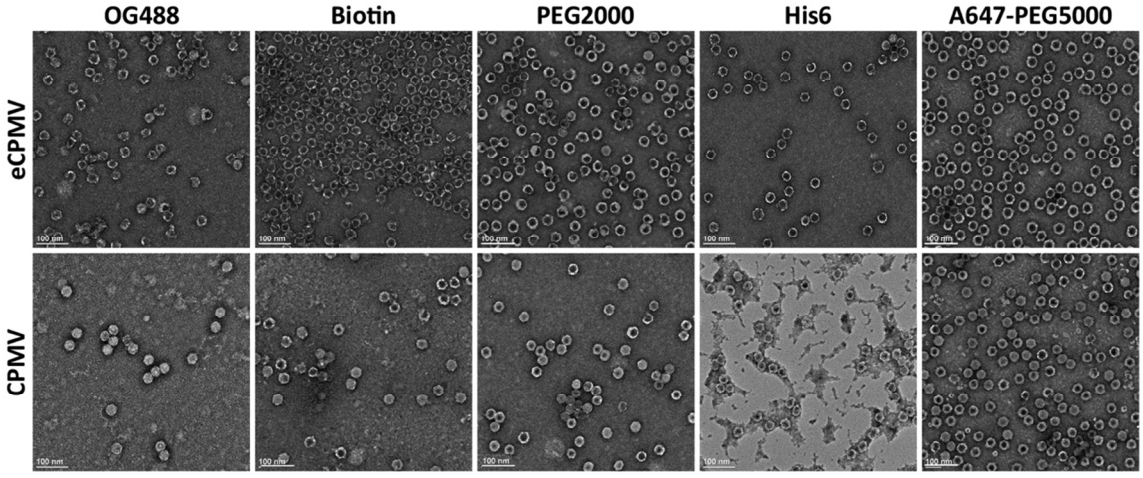

Figure S1. TEM images of eCPMV and CPMV formulations negatively stained with uranyl acetate demonstrate particle integrity. The eCPMV formulations were labeled at interior cysteine side chains, and CPMV particles were labeled at exterior lysine side chains, except in the case of A647-PEG5000 where both formulations were decorated with PEG5000 on the outside; A647 was attached on the interior surface in case of eCPMV and exterior surface for CPMV. Scale bar is 100 nm.

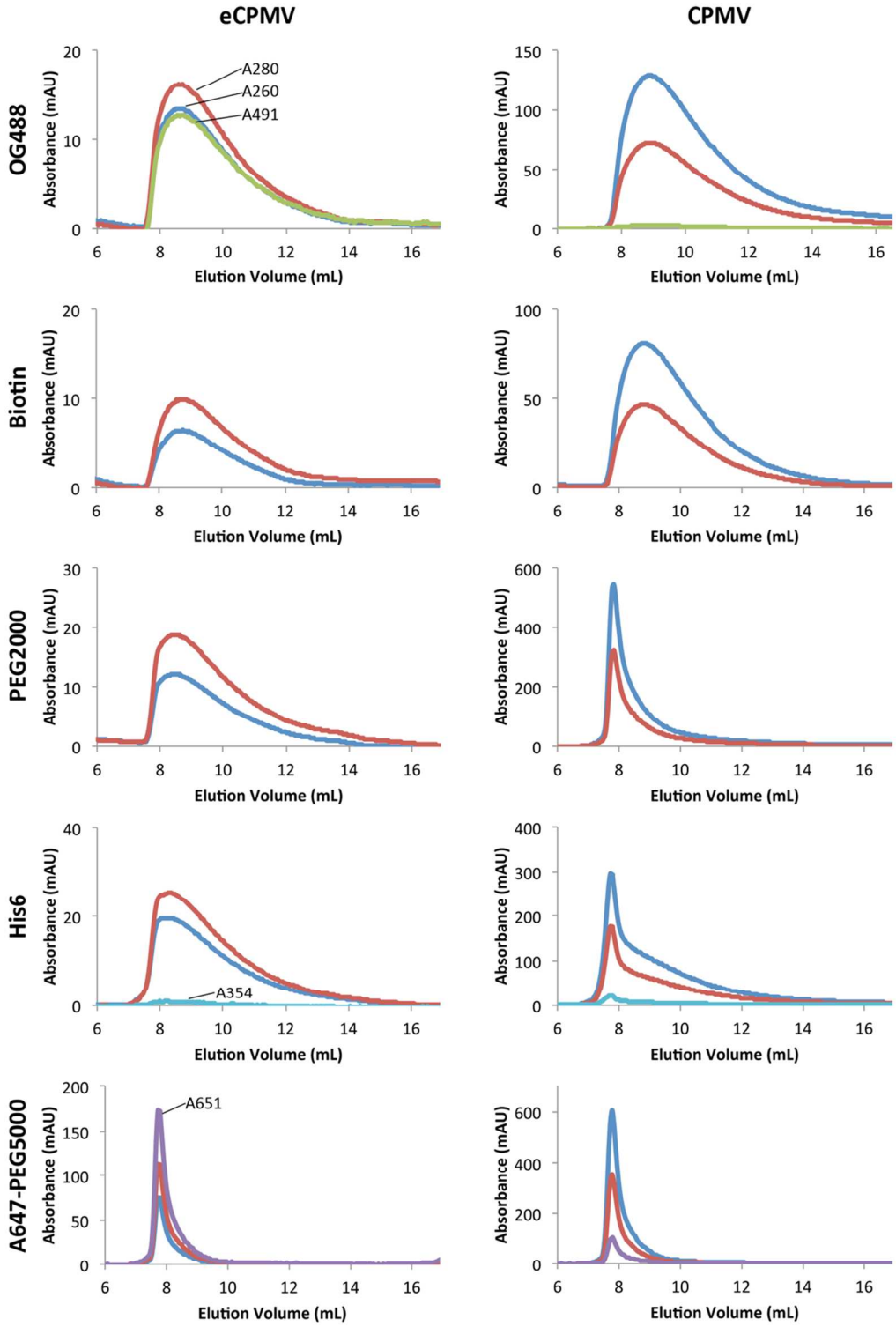

Figure S2. Size exclusion FPLC analysis of the same particles as shown in Figure S1 (blue=260 nm; red=280 nm; green=491 nm; sky blue=354 nm; purple=651 nm). The elution profiles demonstrate particle integrity, with coelution seen for the dyes (A491 nm for OG488 and A651 nm for A647) as well as for His6 (A354 nm for hydrazone bond) indicating successful labeling of intact particles. There are noticeable shifts to the left for CPMV-PEG2000$_E$, PEG5000$_E$-

eCPMV-A647$_I$, and PEG5000$_E$-CPMV-A647$_E$ due to increase in size from exterior labeling with PEG. The two-phased peak for CPMV-His6$_E$ may indicate signs of aggregation, which has been previously reported for exterior labeling of charged peptides.[1] Large particle aggregation can be ruled out for any formulation synthesized based on TEM images (see Figure S1).

References

1. Wu, Z.; Chen, K.; Yildiz, I.; Dirksen, A.; Fischer, R.; Dawson, P. E.; Steinmetz, N. F. *Nanoscale* **2012,** *4*, 3567-3576.