Electronic Supplementary Information for

Shaping bio-inspired nanotechnologies to target thrombosis for dual optical-magnetic resonance imaging

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Supplementary Materials

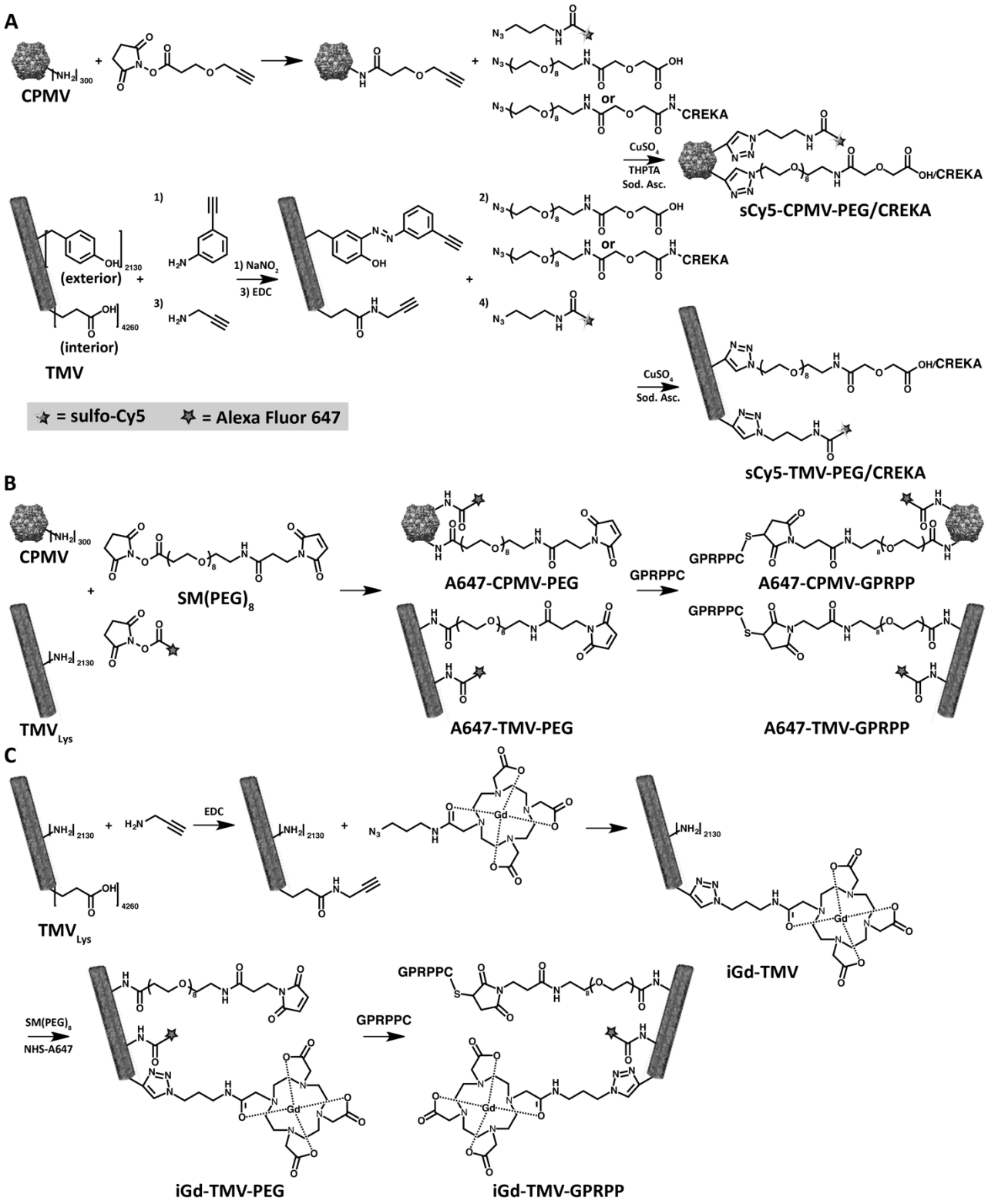

Fig. S1. Bioconjugation reaction schemes for conjugation of contrast agents along with either PEG or targeting ligands to CPMV and TMV. (**A**) Synthesis of particles for targeting with CREKA. (**B**) Particle conjugation for targeting with GPRPP. (**C**) Additional conjugation of Gd(DOTA) for MR imaging before dye and GPRPP attachment.

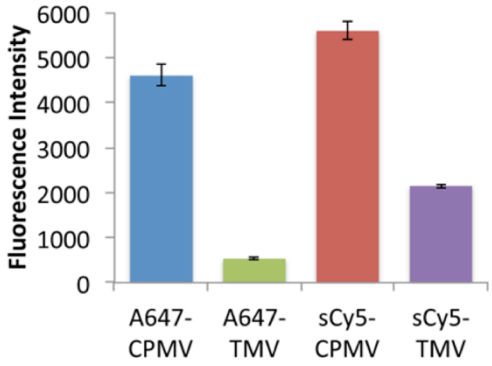

Fig. S2. Fluorescence intensity measurements of particles. Fluorescence intensity was measured at a concentration of 0.25 mg/mL, with much higher fluorescence observed for CPMV particles compared to TMV particles. This can be explained by presentation of the fluorophores in varying molecular environments and with varying inter-dye distances given by the elongated rod *versus* the icosahedral shaped carrier system. The data were normalized based on the relative fluorescence intensities.

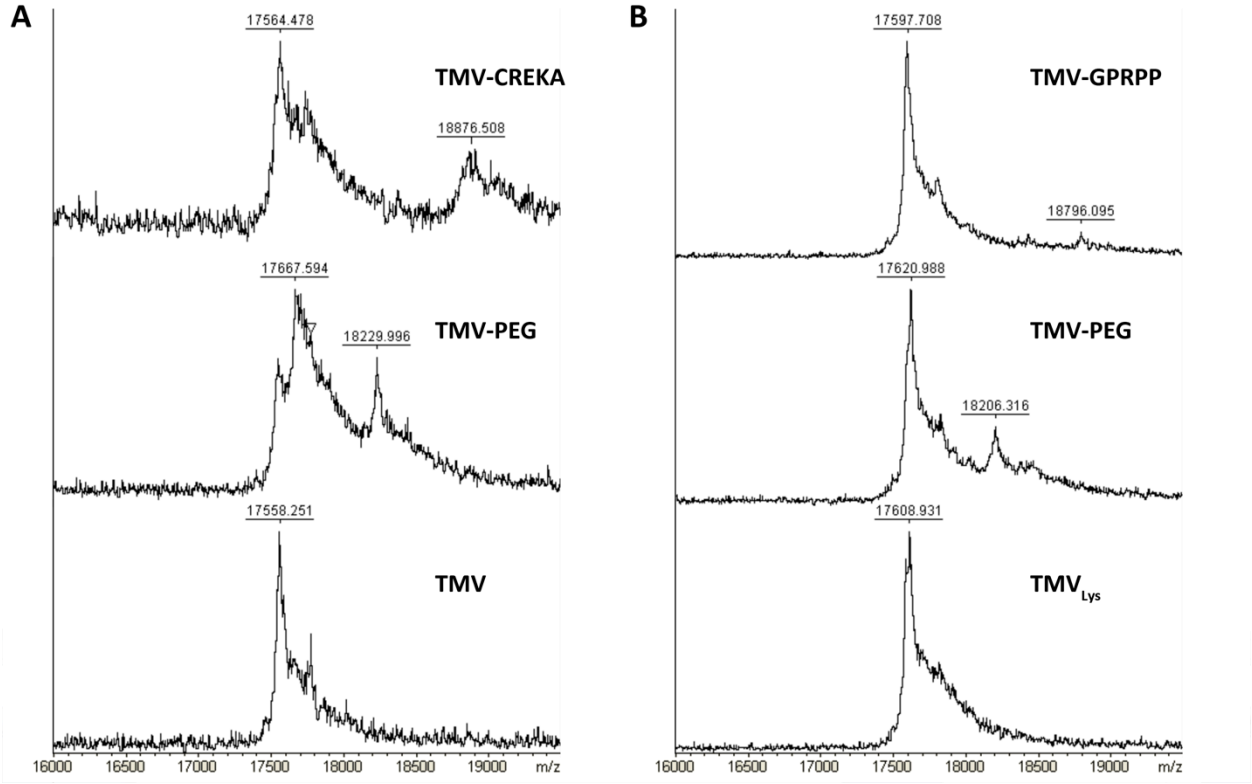

Fig. S3. MALDI-TOF MS spectra. (**A**) Spectra of native TMV, TMV-PEG, and TMV-CREKA particles used for CREKA studies. (**B**) Spectra of TMV_{Lys}, TMV-PEG, and TMV-GPRPP particles used for GPRPP studies. Tabulated masses compared to predicted masses can be found in **Table S3**. Note that this is not a quantitative method as different ionization probabilities (and thus different peak intensities) can result from slight changes in structure.[1]

Table S1. Measured and theoretical mass for peaks obtained by MALDI-TOF MS.

Sample	Measured Mass	Predicted Mass
TMV	17,558	17,534
TMV-PEG	17,668	17,534
	18,230	18,217
TMV-CREKA	17,564	17,534
	18,877	18,804
TMV_{Lys}	17,609	17,561
TMV-PEG	17,621	17,561
	18,206	18,136
TMV-GPRPP	17,598	17,561
	18,796	18,761

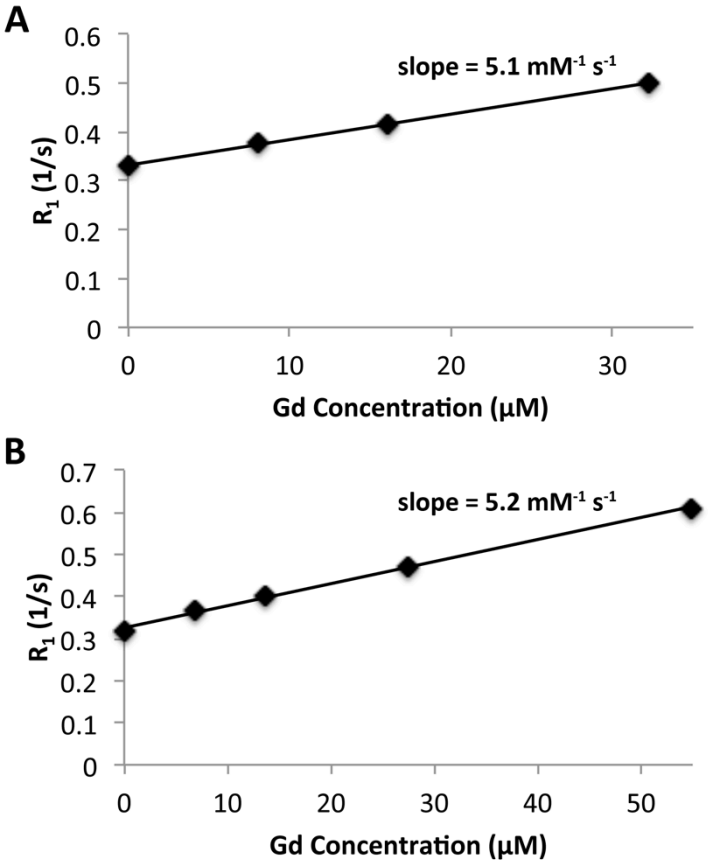

Fig. S4. Relaxivity measurements. Determination of relaxivity of Gd(DOTA)-loaded TMV (**A**) and CPMV (**B**) was based on a multi-slice saturation recovery Look-Locker sequence to measure R_1 *versus* Gd concentration.

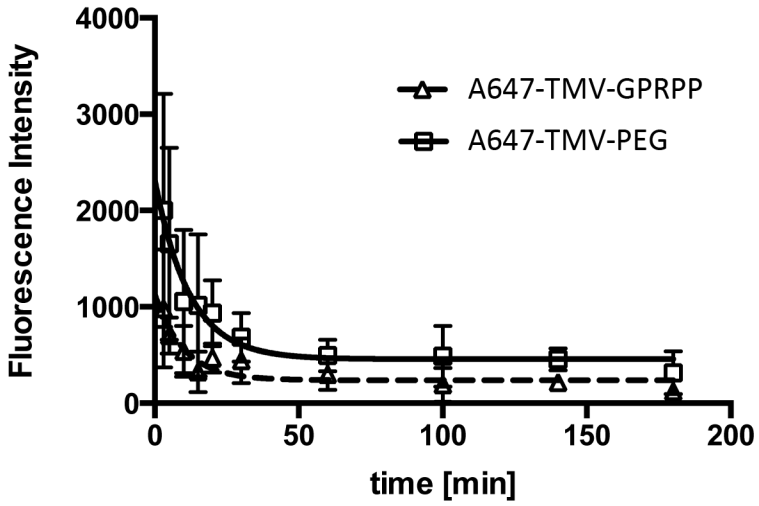

Fig. S5. Pharmacokinetics of particles. A647-TMV-GPRPP and A647-TMV-PEG were injected intravenously and fluorescent measurements of serum samples taken at each time point (n = 3). Data were analyzed using Prism software. The half-lives of the particles were 6.9 and 8.3 min, respectively.

References:

1. S. Weidner, G. Kühn and U. Just, *Rapid Commun. Mass Spectrom.*, 1995, **9**, 697-702.