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Supporting Information

A Generalized System for Photo-Responsive Membrane Rupture in Polymersomes

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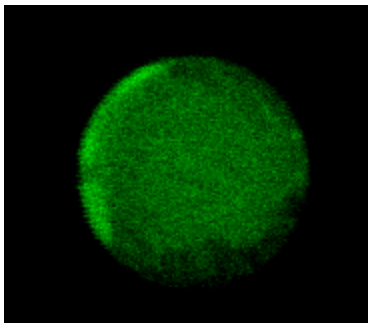

Figure S1: FITC-labeled dextran (500,000 M_W) encapsulated in the aqueous core of a polymersome

The fluorescent image of FITC-labeled dextran shows that dextran encapsulated in the aqueous core of the polymersome is concentrated at one edge of the membrane. FRAP experiments done with FITC-dextran show that dextran is immobile at the membrane and indicate a close association and interaction at this interface.

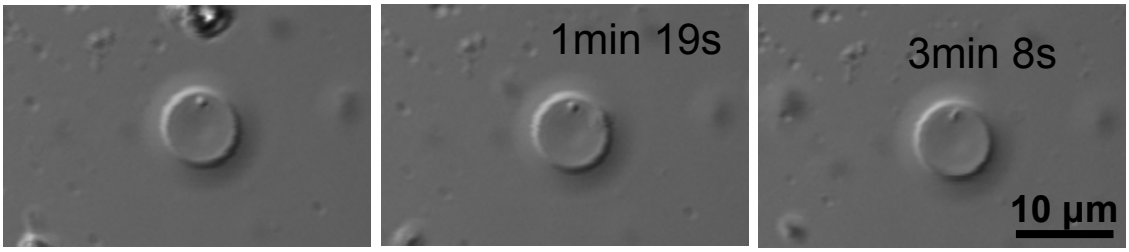

Figure S2: Time lapse of high M_W Polyethylene oxide (PEO)-encapsulated polymersome under 400-700 nm laser exposure

As shown in Fig. S2, when PEO (200,000 M_W) was encapsulated in the aqueous core of polymersomes that contained PZn_2 in their membrane, no membrane deformation results. Replacement of dextran with the more hydrophilic and inert PEO destroys the photo responsive property of the vesicle, because PEO does not interact with the membrane. The PEO encapsulation also results in a more viscous solution in the polymersome core, but the increased viscosity doesn't affect the photo-lability of the membrane. Thus any viscosity increase that occurs upon dextran encapsulation in the polymersome core is not a significant contribution to the dextran mediated membrane instability in our current system. This control further shows that dextran amphiphilic interactions with the membrane cause membrane instability and the resulting photo-induced deformation.