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Effects of PEGylation on Liposome Degradation by a Model Phospholipase PIN ZHANG, VERONICA VILLANUEVA, ALEXANDER DONOVAN, University of Illinois at Chicago, BINHUA LIN, WEI BU, Center for Advanced Radiation Sources, University of Chicago, YING LIU, University of Illinois at Chicago, DEPARTMENT OF CHEMICAL ENGINEERING, UNIVERSITY OF ILLINOIS AT CHICAGO TEAM[1], CENTER FOR ADVANCED RADIATION SOURCES, UNIVERSITY OF CHICAGO COLLABORATION[2] — Polyethylene glycol (PEG) has been conjugated to phospholipids to form liposomes with longer blood circulation time, since PEG brushes prevent non-specific protein adsorption and help particles escape phagocytosis. Although PEG provides steric repulsions, it also affects lipid packing and liposome stability. We report here liposomes hydrolysis catalyzed by secreted phospholipase A2 (sPLA2), with an emphasis on revealing the contradictory effects of PEG. The kinetics of liposome hydrolysis were studied by dynamic light scattering. We measured the hydrolysis lag times of liposomes by monitoring the changes in size after mixing with different concentrations of sPLA2. The results followed two exponential functions, defining regimes of degradation kinetics. The effects of PEGylation on the packing of the phospholipid monolayers were studied using X-ray reflectivity and grazing incidence diffraction. The packing of phospholipid monolayers was just slightly disturbed with the inclusion of 5-10

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