Supporting Information (for Figs. S-1 to S-5).

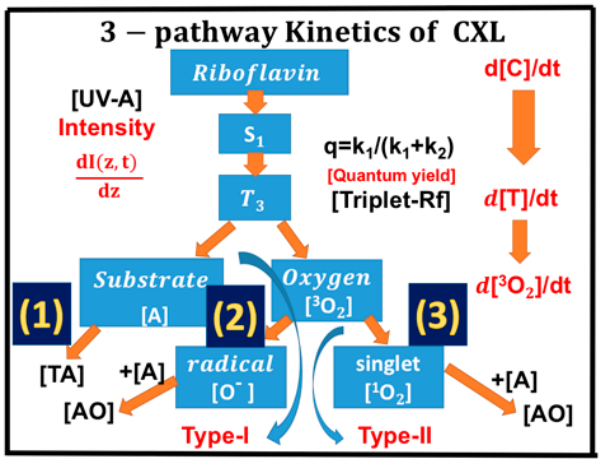

Fig. S-1 The kinetics of PDT showing both type-I and type-II pathways for UVA and riboflavin initiated corneal crosslinking [17].

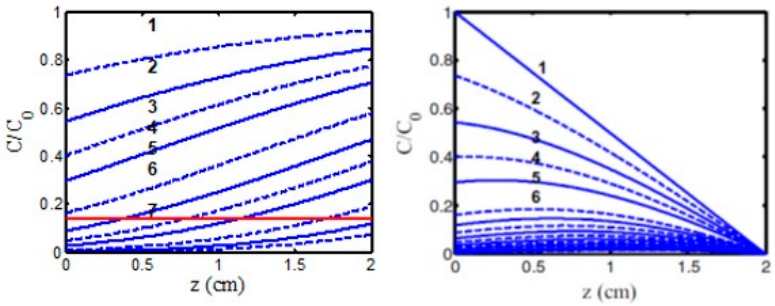

Fig. S-2 The normalized photoinitiator concentration profiles (for type-I) for uniform (left figure) and non-uniform (right figure, with D=1.0 cm) PS initial distribution, for t=0 (curves 1) and t=50, 100, 150, 200, 300, 350 seconds (curves 2 to 7) with quantum yield q=1.0, a'=0.2(mM·cm)$^{-1}$, b'=0.15 (mM·cm)$^{-1}$, and Q=0.1 (1/cm) [26,28].

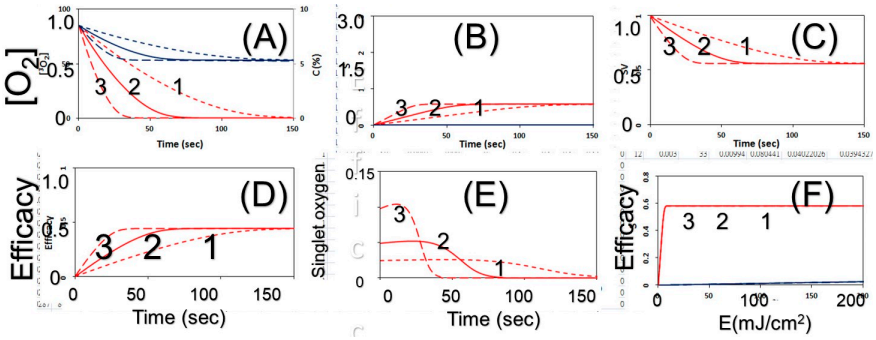

Fig. S-3 Same as Fig. 4, but for a higher [A]=100 uM, having a lower efficacy.

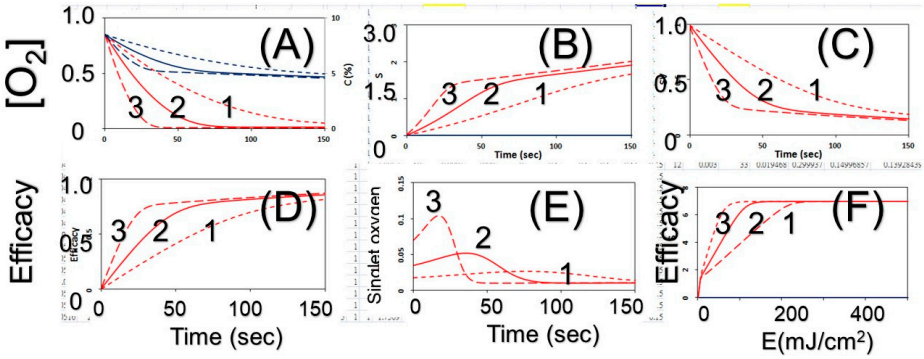

Fig. S-4 Same as Fig. 4, but for *p*=0.15 (1/s), with external oxygen source.

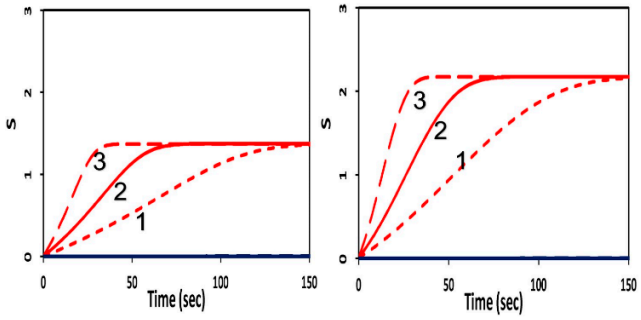

Fig. S-5 The effect of substrate concentration, [A]= 100 uM (left curve) and 50 uM right curve), for I_0= (50,100,200) mW/cm², and p=0.

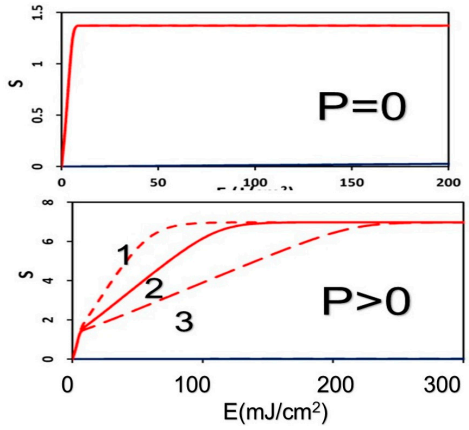

Fig. S-6 Comparison of type-II S-profiles for the cases of p=0 (without oxygen source term), and p=0.15 (1/s) (with external oxygen).