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Self assembled photo additives allow stop and go pharmacokinetic

Terry W J Steele, Cheng Ting, Fiorenzo Vetrone and Robert Marks
Nanyang Technological University, Singapore

Biodegradable polyesters are widely applied in the as drug release matrices. However, once manufactured or implanted their release kinetics tend to be fixed with little modulation possible for optimal drug concentrations in the local environment. Various polyester thins have been fabricated into thin films (~50 µm thick) with additives of photocatalytic ZnO nanoparticles, doped LiYF₄ upconversion nanoparticle, or combination thereof and irradiated with near infrared (980 nm) laser diodes to induce photocatalysis. Self-assembly of ZnO and LiYF₄ nanoparticles allow drug release kinetics enhanced up to 500x more than non-irradiated, polyester films. Drug release kinetics are halted once NIR light is removed, allowing feedback controlled, stop and go drug release therapies.

Biography

Terry W J Steele has completed his PhD from the University of Minnesota (2006) and Postdoctoral studies from Philipps Marburg University and Nanyang Technological University, where he was promoted to Assistant Professor in 2011. He has published more than 30 papers in reputed journals and has interests in on-demand adhesives, stimulated drug delivery, smart biomaterials, microfluidics, medical implants and plasma related surface functionalizations.

wjsteele@ntu.edu.sg

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