Supporting Information

Synthesis and *In Vitro* Properties of Iron Oxide Nanoparticles Grafted with Brushed Phosphorylcholine and Polyethylene Glycol

Thomas Blin,[a] Aleksandr Kakinen,[a,b] Emily H. Pilkington,[a] Angela Ivask,[c] Feng Ding,[d] John F. Quinn,[a] Michael R. Whittaker,[a] Pu Chun Ke[a] and Thomas P. Davis[a,e]**

[a]ARC Centre of Excellence in Convergent Bio-Nano Science and Technology, Monash Institute of Pharmaceutical Sciences, Monash University, 381 Royal Parade, Parkville, VIC 3052, Australia

[b]Laboratory of Environmental Toxicology, National Institute of Chemical Physics and Biophysics, Akadeemia tee 23, Tallinn 12618, Estonia

[c]Future Industries Institute, University of South Australia, Mawson Lakes, SA 5095, Australia

[d]Department of Physics and Astronomy, Clemson University, Clemson, SC 29634, USA

[e]Department of Chemistry, University of Warwick, Gibbet Hill, Coventry, CV4 7AL, United Kingdom

* Address correspondence to:

Thomas P. Davis: thomas.p.davis@monash.edu; Pu Chun Ke: pu-chun.ke@monash.edu

Keywords: phosphorylcholine brushes · polyethylene glycol · RAFT synthesis · suspendability · biocompatibility · cell uptake · iron oxide nanoparticles

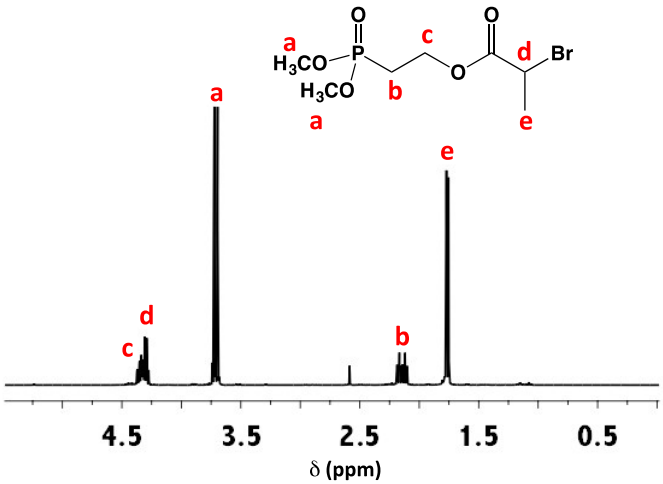

Figure S1. ^{1}H NMR spectrum of 2-(2-bromopropionyloxy)ethyl) phosphonate in $CDCl_3$.

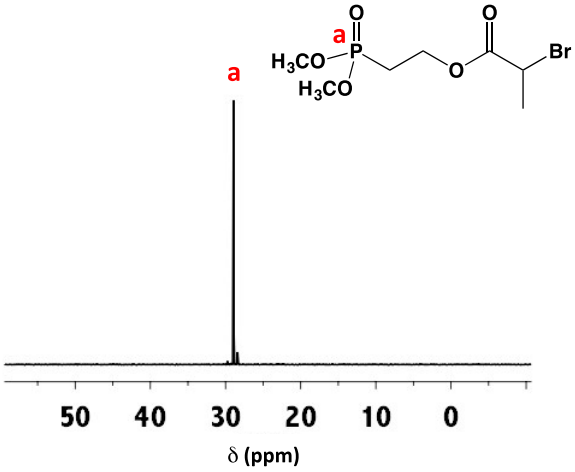

Figure S2. ^{31}P NMR spectrum of 2-(2-bromopropionyloxy)ethyl) phosphonate in $CDCl_3$.

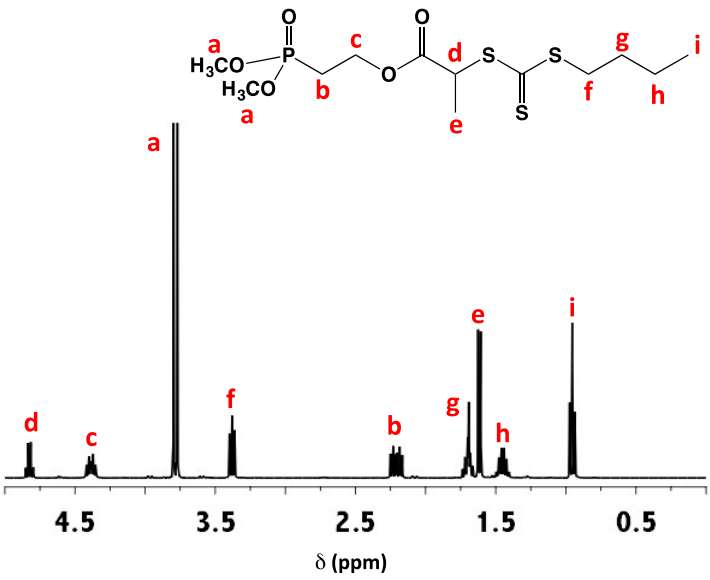

Figure S3. ^{1}H NMR spectrum of 2-(*n*-butyltrithiocarbonate)-propionic acid 2-(dimethoxyphosphonyl)-ethyl ester (**RA1**) in $CDCl_3$.

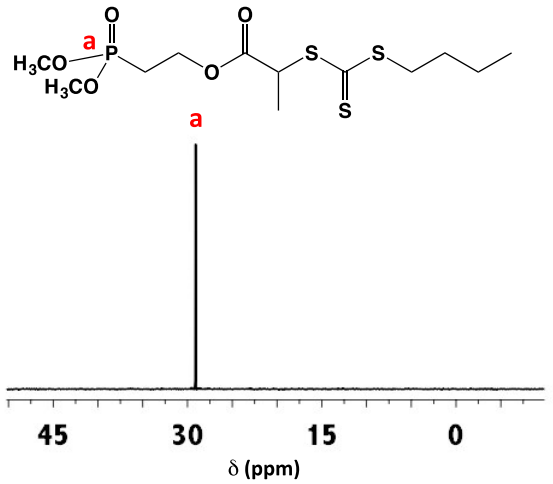

Figure S4. ^{31}P NMR spectrum of 2-(*n*-butyltrithiocarbonate)-propionic acid 2-(dimethoxyphosphonyl)-ethyl ester (**RA1**) in $CDCl_3$.

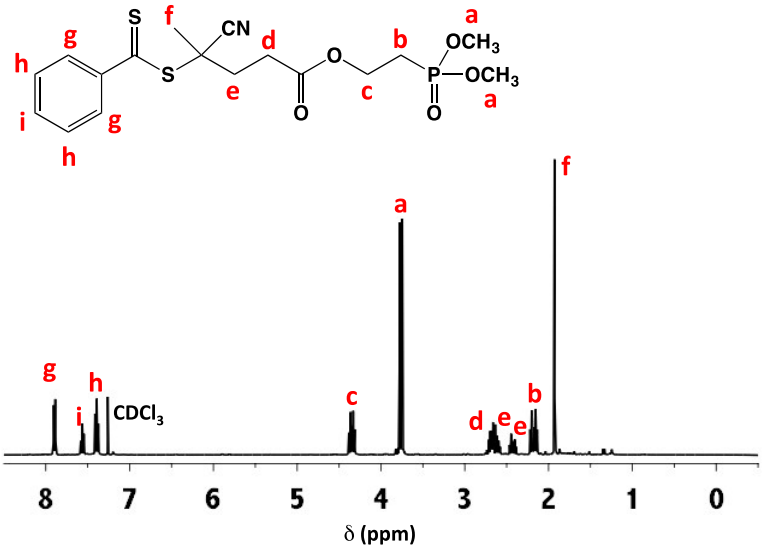

Figure S5. ^{1}H NMR spectrum of 4-cyano-4-(phenylcarbonothioylthio) pentanoic acid 2-(dimethoxyphosphonyl)-ethyl ester (**RA2**) in $CDCl_3$.

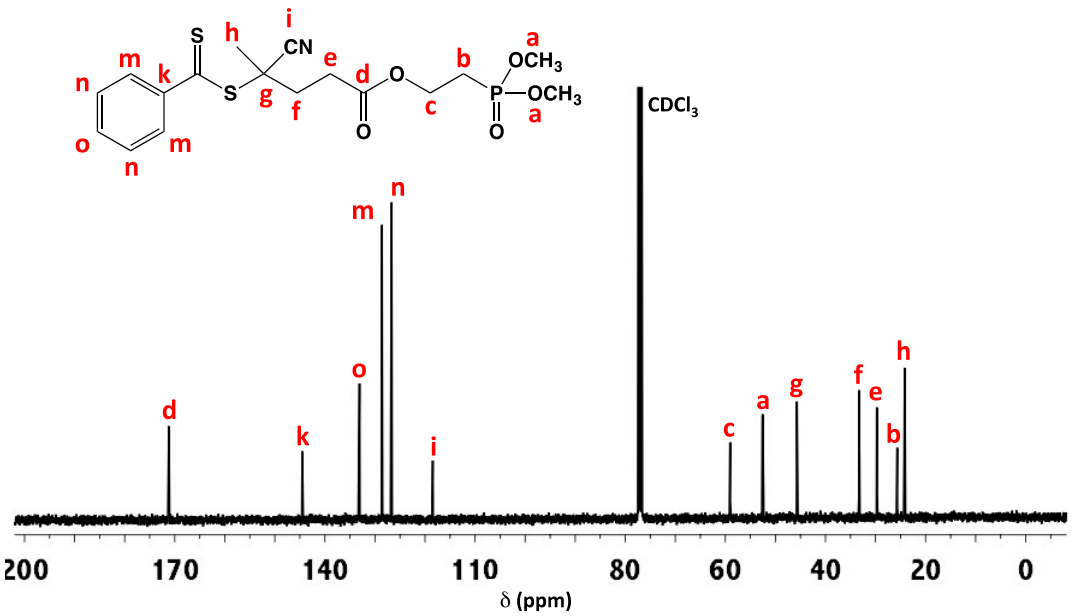

Figure S6. ^{13}C NMR spectrum of 4-cyano-4-(phenylcarbonothioylthio) pentanoic acid 2-(dimethoxyphosphonyl)-ethyl ester (**RA2**) in $CDCl_3$.

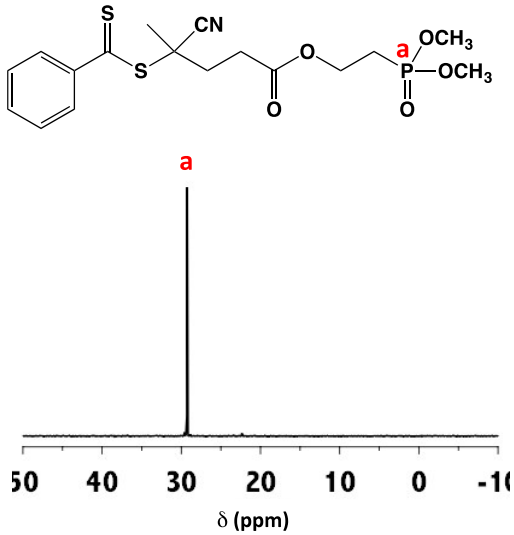

Figure S7. ^{31}P NMR spectrum of 4-cyano-4-(phenylcarbonothioylthio) pentanoic acid 2-(dimethoxyphosphonyl)-ethyl ester (**RA2**) in $CDCl_3$.

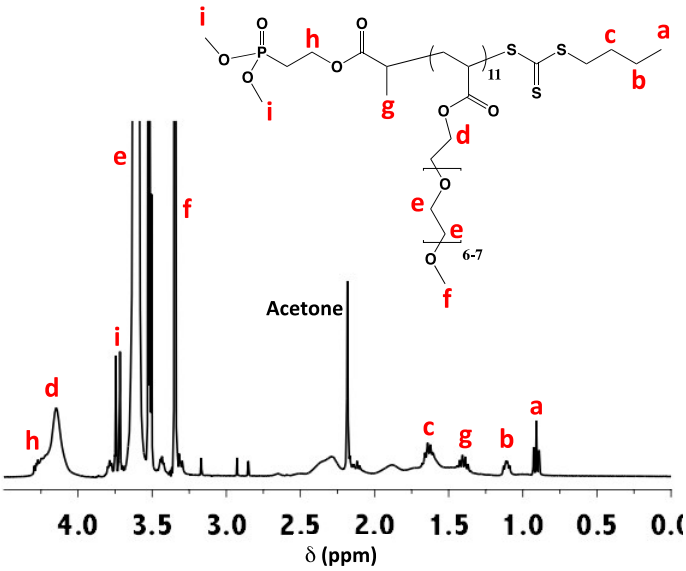

Figure S8. ^{1}H NMR spectrum of protected poly(OEGA) in $CDCl_3$.

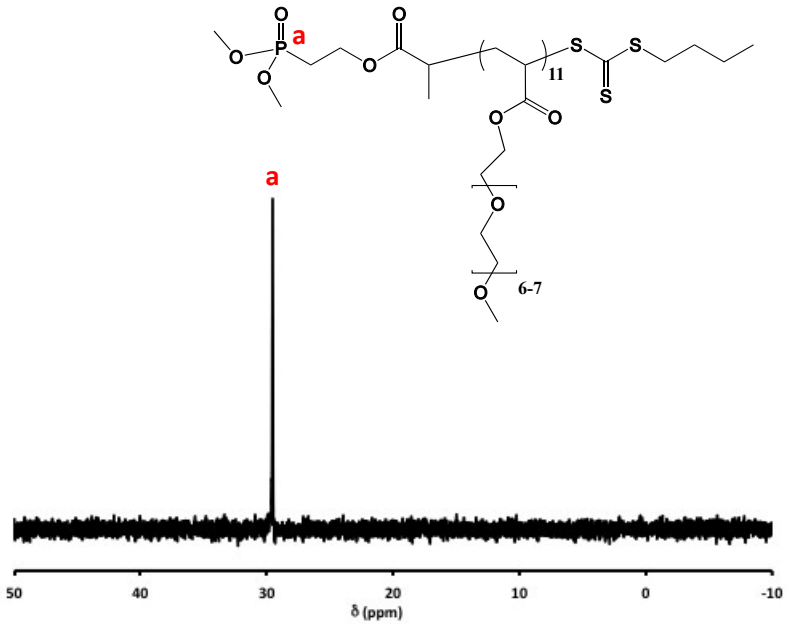

Figure S9. ^{31}P NMR spectrum of protected poly(OEGA) in $CDCl_3$.

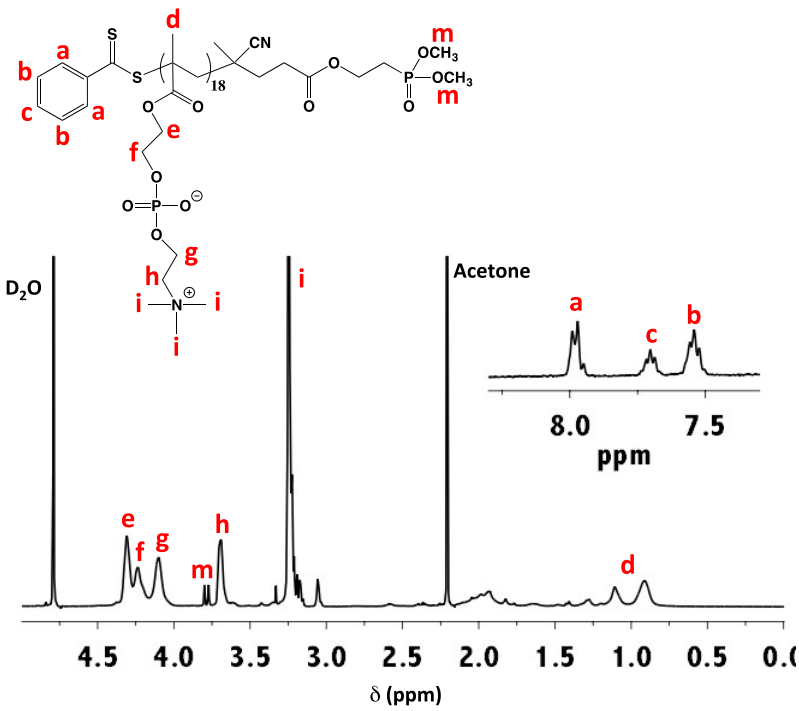

Figure S10. ^{1}H NMR spectrum of protected poly(MPC) in D_2O. The inset figure is the expanded region, 7.4 – 8.1 ppm, showing the protons of the benzyl end group.

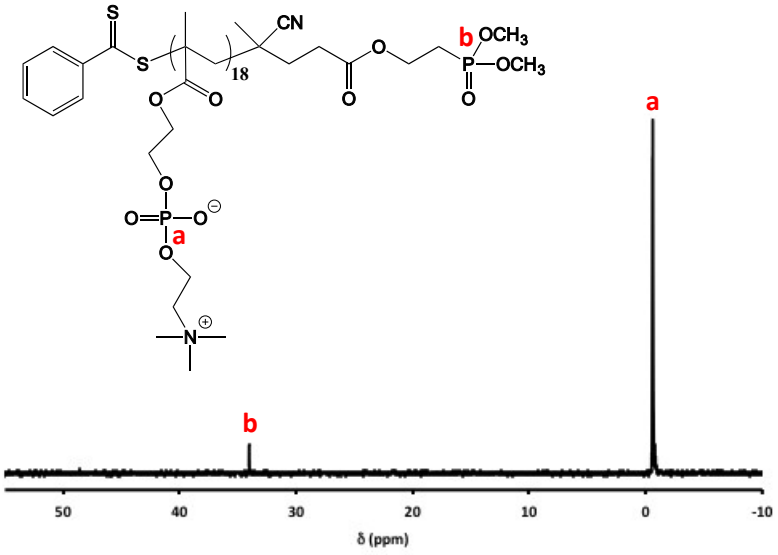

Figure S11. ^{31}P NMR spectrum of protected poly(MPC) in D_2O.