Electronic Supplementary Information (ESI) Abelha et al (2019), Journal of Materials Chemistry B. Low molecular weight PEG-PLGA polymers provide a superior matrix for conjugated polymer nanoparticles in terms of physicochemical properties, biocompatibility and optical/photoacoustic performance.

Properties of nanoparticles in biologically relevant media

The properties of nanoparticles dispersed in a non-ionic and protein-free environment are susceptible to alteration when exposed to solutions with higher ionic strength and serum proteins, such as physiological buffers and cell culture medium (CCM) [1]. The properties of PEG-PLGA nanoparticles containing 0 or 5% PCPDTBT (2.1 mg/mL) were assessed with respect to pH, size, and zeta potential following dispersion and 24 h incubation at 37°C in water and CCM at 300 µg/mL. NTA analysis revealed that all freshly prepared PEG-PLGA systems containing 5% PCPDTBT were ~30-40 nm larger than particles without PCPDTBT. Further, both the PEG_{2kDa}-$PLGA_{4kDa}$ and PEG_{5kDa}-$PLGA_{55kDa}$ systems showed an apparent ~20 nm size increase in serum over 24 h, although not statistically significant (**Figure S1A, ESI**). The size increase was accompanied by a moderate increase in electronegative zeta potential (**Figure S1B, ESI**), due to protein adsorption to the particle surface [2]. However, since this experiment did not measure the zeta potential of the so-called "hard corona" (which remains following rigorous washing), the results reflect on the measurement conditions and not primarily the effects of PEG chain length.

Freshly prepared suspensions exhibited an average pH of 6.0, which decreased to ~5.0 after 24 h incubation in distilled water at 37°C. No effect of the PCPDTBT content on the acidification rate was observed, indicating no influence of the conjugated polymer on PEG-PLGA biodegradation rate. The acidification is attributed to the hydrolysis of PLGA generating lactic and glycolic acid as degradation products. Despite the pH decrease measured in water, the buffering properties of these media were sufficient to prevent pH decrease in cell culture studies.

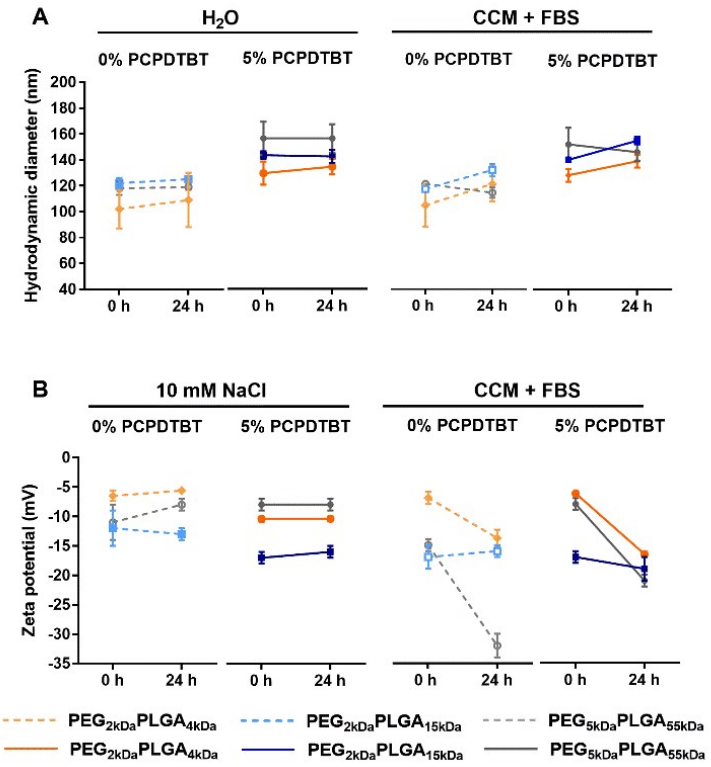

Figure S1: A) NTA-derived hydrodynamic diameters of nanoparticles incubated for 24 h at 37°C in H_2O (left) or CCM containing 10% FBS (right). B) Zeta potential measured before and after 24 h incubation at 37°C in 10 mM NaCl (left) or CCM containing 10% FBS (right). Values represent the mean ± standard deviation of n=3 experiments with separate nanoparticle batches.

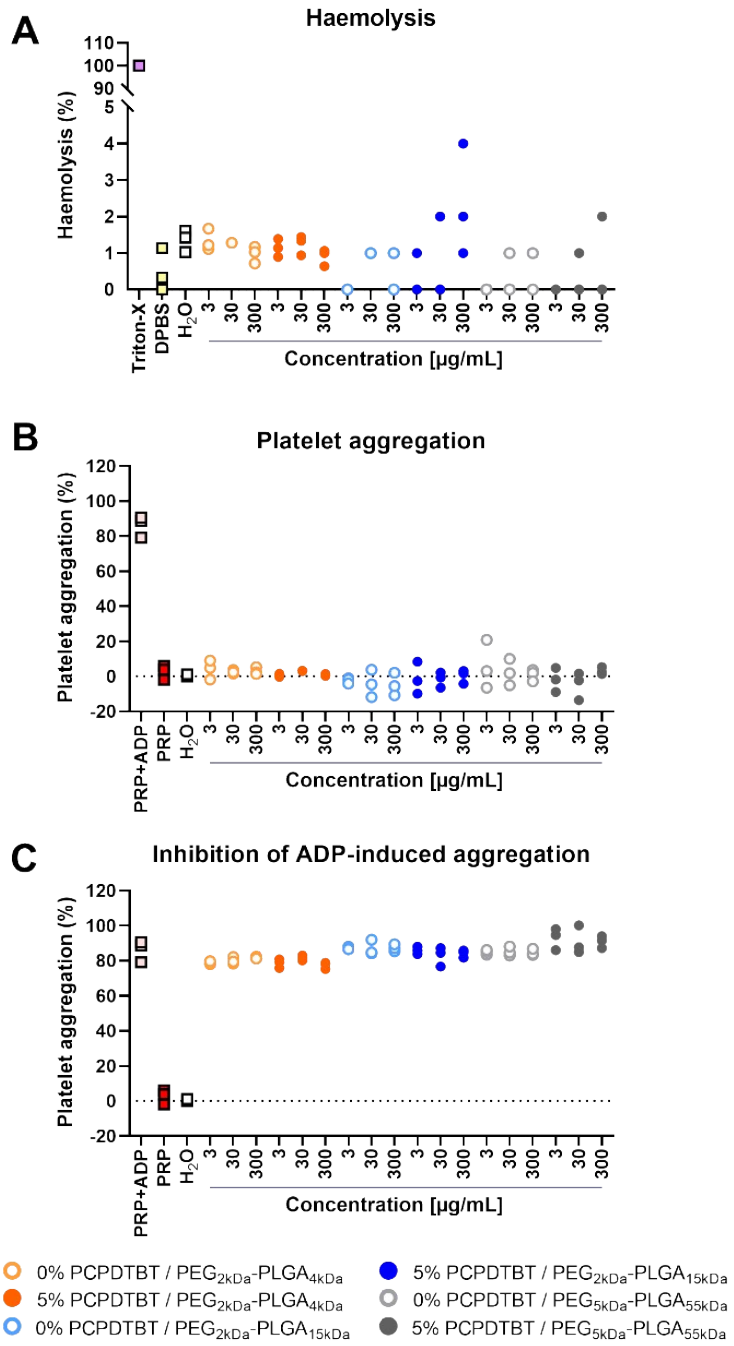

Figure S2: (A) Percentage haemolysis of positive control (Triton-X, 100% haemolysis), negative control (DPBS), vehicle control (H_2O) and nanoparticles at 3, 30 and 300 µg/mL. (B) Percentage platelet aggregation over 16 minutes incubation with nanoparticle systems at 3, 30 and 300 µg/mL. ADP (10 µM) was added to platelet-rich plasma (PRP) to induce 100% aggregation, while PRP alone acted as a reference. (C) Nanoparticles were incubated with PRP followed by stimulation of aggregation with ADP (10 µM). Values represent the individual data points from n=3 different blood donors.

References

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