

Identification of Nanoparticle Properties for Optimal Drug Delivery Across a Physiological Cell Barrier

Aisling M. Ross^{1,2,*}, Rachel M. Cahalane^{1,2,3}, Darragh R. Walsh^{1,2}, Andreas M. Grabrucker^{1,4,5}, Lynnette Marcar⁶ and John J. E. Mulvihill^{1,2,4,*}

File S4 – Cell Viability

The viability of the various cells were evaluated and statistically analysed against different NP parameters (size, zeta potential).

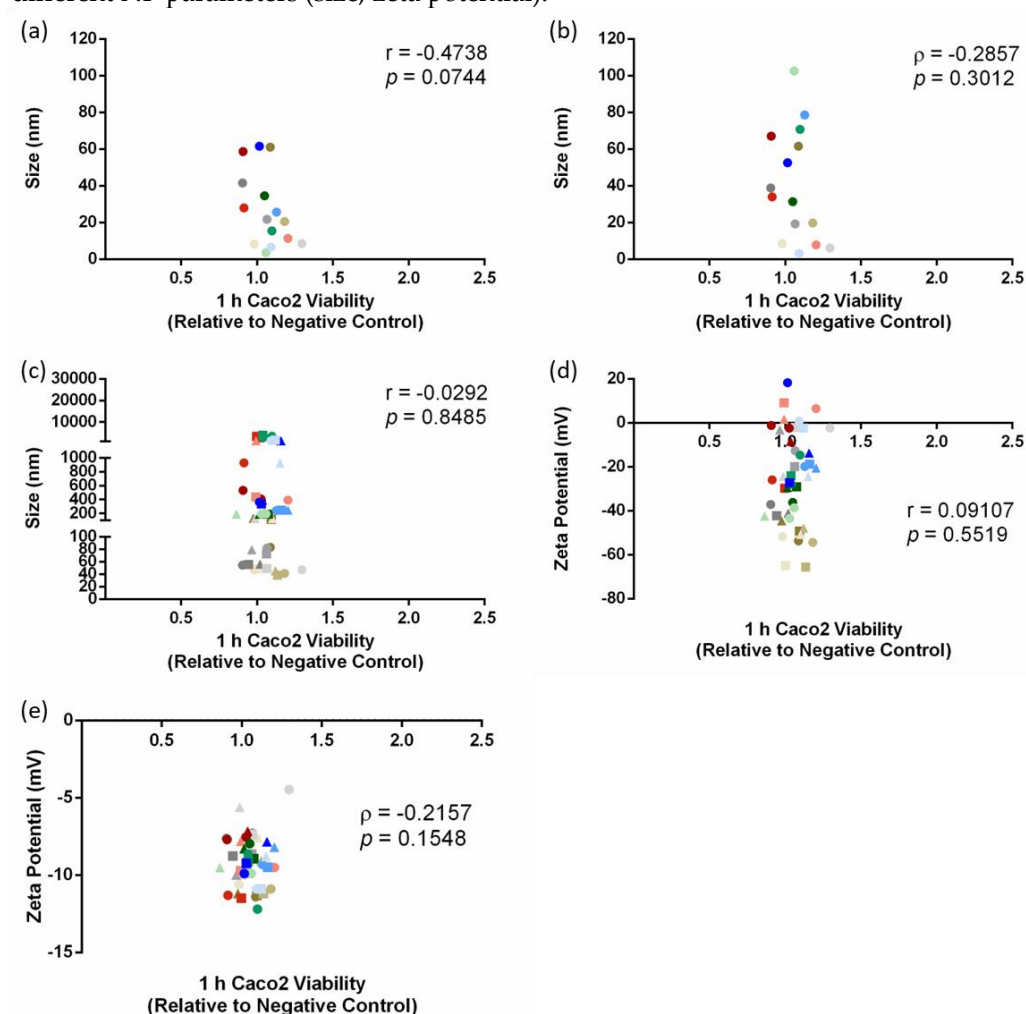


Figure S4. Correlations between changes to Caco-2 cell viability after 1 h nanoparticle (NP) treatment and NP properties. (a) Pearson's correlation between Caco-2 cell viability after 1 h treatment and NP size (measured via TEM) in water. (b) Spearman's correlation between Caco-2 cell viability after 1 h treatment and NP size (measured via TEM) in media. (c) Pearson's correlation between Caco-2 cell viability after 1 h treatment and nanoparticle size (measured via DLS) in water. (d) Pearson's correlation between Caco-2 cell viability after 1 h treatment and nanoparticle zeta potential measured in water. (e) Spearman's correlation between Caco-2 cell viability after 1 h treatment and nanoparticle zeta potential measured in media. ● = 100 µg/mL NP dispersion, ■ = 10 µg/mL NP dispersion, Δ = 1 µg/mL NP dispersion, TEM = Transmission electron microscopy, DLS = Dynamic Light Scattering.

light scattering. Colour Key for all graphs: Au = Gold, Ag = Grey, Fe₂O₃ = Red, TiO₂ = Green, and ZnO = Blue.

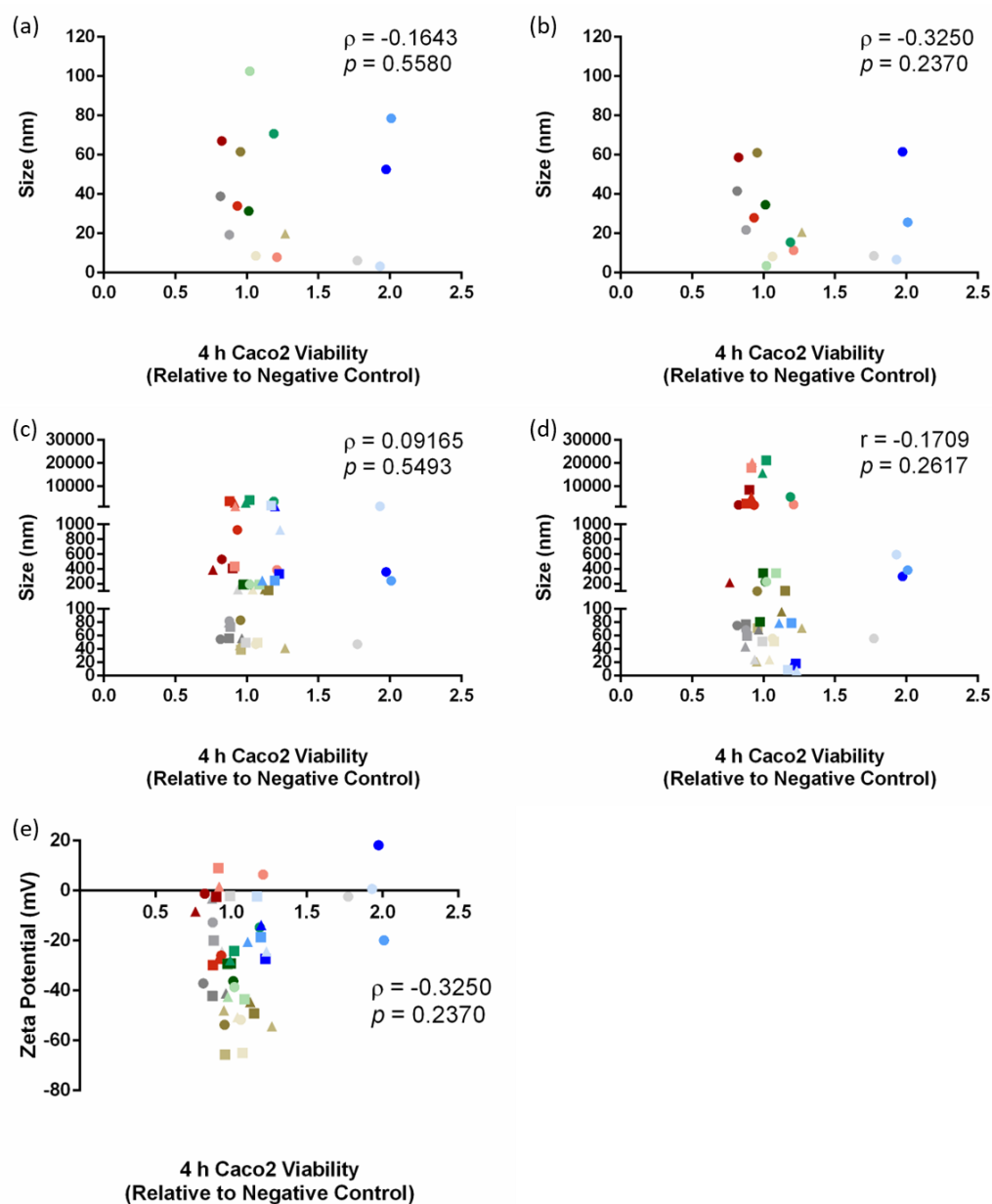


Figure S5. Correlations between changes to Caco-2 cell viability after 4 h nanoparticle (NP) treatment and NP properties. (a) Spearman's correlation between Caco-2 cell viability after 4 h treatment and NP size (measured via TEM) in water. (b) Spearman's correlation between Caco-2 cell viability after 4 h treatment and NP size (measured via TEM) in media. (c) Spearman's correlation between Caco-2 cell viability after 4 h treatment and NP size (measured via DLS) in water. (d) Pearson's correlation between Caco-2 cell viability after 4 h treatment and NP size (measured via DLS) in media. (e) Spearman's correlation between Caco-2 cell viability after 4 h treatment and NP zeta potential in water. ● = 100 µg/mL NP dispersion, ■ = 10 µg/mL NP dispersion, Δ = 1 µg/mL NP dispersion, TEM = Transmission electron microscopy, DLS = Dynamic light scattering. Colour Key for all graphs: Au = Gold, Ag = Grey, Fe₂O₃ = Red, TiO₂ = Green, and ZnO = Blue.

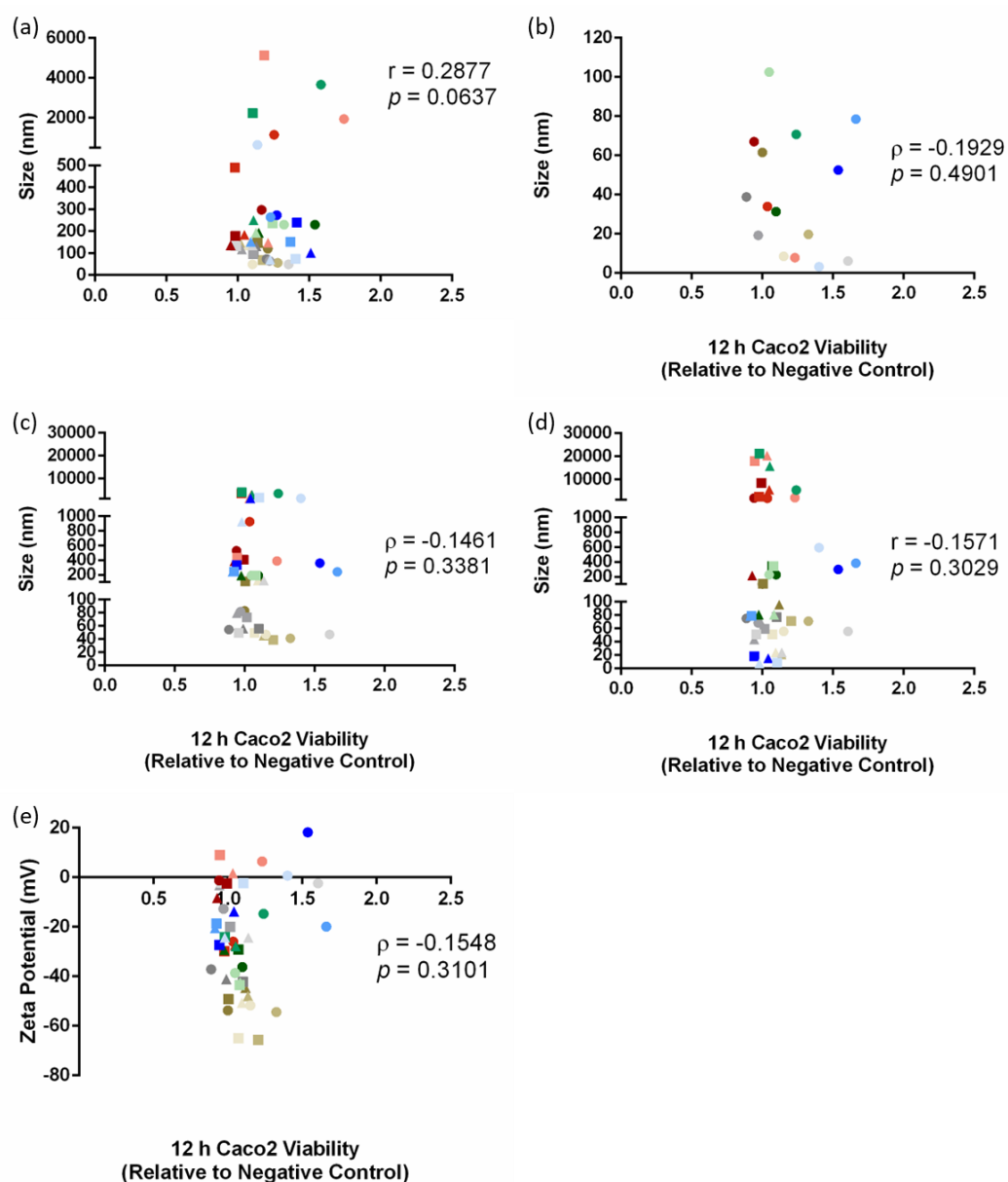


Figure S6. Correlations between changes to Caco-2 cell viability after 12 h nanoparticle (NP) treatment and NP properties. (a) Pearson's correlation between Caco-2 cell viability after 12 h treatment and NP size (measured via TEM) in water. (b) Spearman's correlation between Caco-2 cell viability after 12 h treatment and NP size (measured via TEM) in media. (c) Spearman's correlation between Caco-2 cell viability after 12 h treatment and NP size (measured via DLS) in water. (d) Pearson's correlation between Caco-2 cell viability after 12 h treatment and NP size (measured via DLS) in media. (e) Spearman's correlation between Caco-2 cell viability after 12 h treatment and NP zeta potential in water. ● = 100 µg/mL dose NP dispersion, ■ = 10 µg/mL NP dispersion, Δ = 1 µg/mL NP dispersion, TEM = Transmission electron microscopy, DLS = Dynamic light scattering. Colour Key for all graphs: Au = Gold, Ag = Grey, Fe₂O₃ = Red, TiO₂ = Green, and ZnO = Blue.

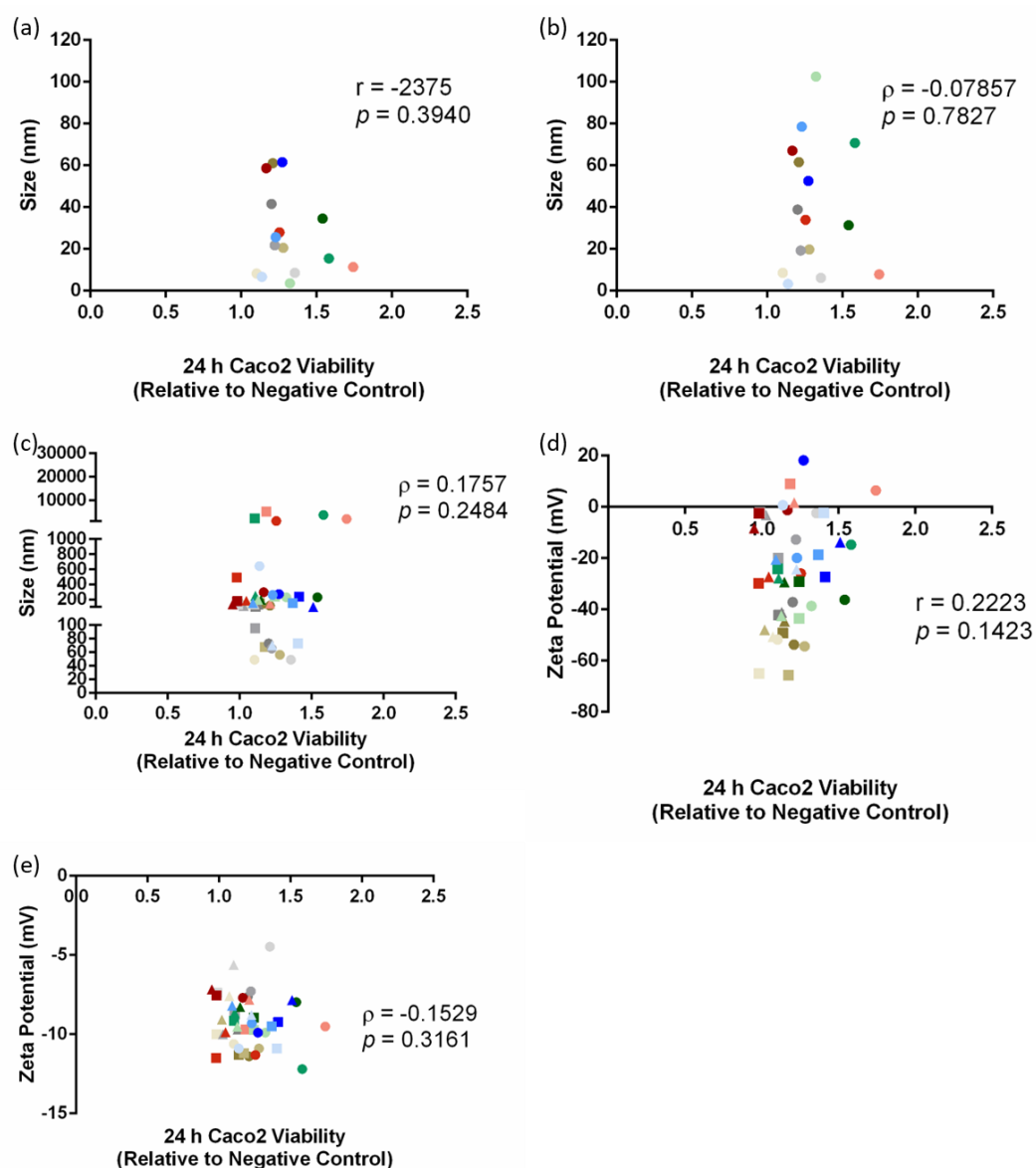


Figure S7. Correlations between changes to Caco-2 cell viability after 24 h nanoparticle (NP) treatment and NP properties. (a) Pearson's correlation between Caco-2 cell viability after 24 h treatment and NP size (measured via TEM) in water. (b) Spearman's correlation between Caco-2 cell viability after 24 h treatment and NP size (measured via TEM) in media. (c) Spearman's correlation between Caco-2 cell viability after 24 h treatment and NP size (measured via DLS) in water. (d) Pearson's correlation between Caco-2 cell viability after 24 h treatment and NP zeta potential measured in water. (e) Spearman's correlation between Caco-2 cell viability after 24 h treatment and NP zeta potential measured in media. ● = 100 µg/mL NP dispersion, ■ = 10 µg/mL NP dispersion, △ = 1 µg/mL NP dispersion, TEM = Transmission electron microscopy, DLS = Dynamic light scattering. Colour Key for all graphs: Au = Gold, Ag = Grey, Fe₂O₃ = Red, TiO₂ = Green, and ZnO = Blue.