The toxicological responses of aquatic animals resulting from exposure to manufactured nanoparticles (NPs) are a major issue in environmental risk assessment. One of the more frustrating and confusing aspects of working with nanomaterials is that as charged colloids, they can directly interact with proteins, dyes and other small molecules resulting in aberrant readings in both physicochemical and toxicological assays. This necessitates the use of extensive control and characterization regimes to effectively measure and interpret toxicological data involving nanomaterials. In this talk, I will highlight these effects, outline some of the required steps our lab uses to effectively control/interpret these colloid:solute interactions. Finally, I will be demonstrating specific nano and non-nano effects on such diverse functions as zebrafish development, in vitro immunological assays and physico-chemical properties of common nanotoxicological assays.