Title: Biomolecular corona on industrially relevant materials

Marco Monopoli
Department of Chemistry – RCSI University of Medicine and Health Sciences
Ireland

Abstract:

For nanomedicine and nanosafety, there is a growing desire for a rational basis within which to understand nanoparticle-cell and organ-level interactions. Nanoparticles in biological fluids (blood, or otherwise) generically associate with a range of biomolecules, especially proteins, organised into the 'protein corona', which is continuously exchanging with the proteins in the environment. In some cases, the residence times of proteins in the corona are sufficiently long that they confer an effective biological identity onto the nanoparticle. The transport and fate of nanoparticles (from intracellular trafficking to clearance pathways) likely reflect the corona, rather than the nanomaterial itself.

Industrial sectors have largely invested in the use of advanced nanomaterials, which are currently being implemented in a wide range of applications; however, the potential exposure to living beings and the environment remains a concern. While some of these materials were not designed to be dispersible in aqueous media, the development of dispersion protocols to ensure compatibility with *in vitro* and *in vivo* assays has become crucial for the accurate assessment of the studies. In some cases, the biomolecular corona protocols also need to be validated.

In our recent studies, we evaluated the validity of the corona protocols on some industrially relevant materials, highlighting gaps and new insights in the field.

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