

The Crown and the Scepter: Roles of the Protein Corona in Nanomedicine

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Engineering nanomaterials are increasingly considered promising and powerful biomedical tools or devices for imaging, drug delivery, and cancer therapies, but few nanomaterials have been tested in clinical trials. This wide gap between bench discoveries and clinical application is mainly due to the limited understanding of the biological identity of nanomaterials. When they are exposed to the human body, nanoparticles (NPs) inevitably interact with body fluids and thereby adsorb hundreds of biomolecules. A “biomolecular corona” forms on the surface of nanomaterials and confers a new biological identity for NPs, which determines the following biological events: cellular uptake, immune response, biodistribution, clearance, and toxicity. A deep and thorough understanding of the biological effects triggered by the protein corona in vivo will speed up their translation to the clinic. To date, nearly all studies have attempted to characterize the components of protein coronas depending on different physiochemical properties of NPs. In this talk, we will review recent advances in order to better understand the impact of the biological effects of the nanoparticle-corona on nanomedicine applications¹⁻⁶. We also highlight the recent development of the impact of protein corona formation on the pharmacokinetics of nanomedicines.

Figure X: (Times New Roman 10 pt and bold) Insert Figures as Word Text Box; Figure Caption 10 pt Times New Roman

References

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