PHYS: Division of Physical Chemistry

197 - Understanding the impact of glycosylation at the bionano interface

View Session Detail

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Abstract: Nanoparticles (NP) are believed to radically change the way we treat diseases. Because of their small size, they can directly interact with biomolecules in a completely different way and their behavior in biology is still not fully understood. Once in biological fluids, NPs rapidly interact with biomolecules from the environment that strongly and rapidly adsorb to the NP surface forming the long-lived biomolecular corona.[1,2]
The biomolecular corona gives a new identity to NP in biological milieu as it has been shown to directly interact with cellular receptors. [3,4] The protein corona is derived from proteins in biological fluids, many of which are glycosylated. we have now shown that the biomolecular corona has a strong glycosylation component and this class of biomolecules plays a drammatic role in the NP colloidal stability and strongly controls the NP biological fate. [5]
In particular *in situ* deglycosylation of the complex leads to partial removal of the glycans component which decreases the colloidal stability of nanoparticle and lead to an increase of nanoparticle uptake of differnetiated macrophages. Additionally the deglycosylated corona-nanoparticles exhibit pro-inflammatory properties compared with the fully glycosylated form, suggesting the importance of glycosylation in the immunological interactions of nanoparticles.
Understanding the relevance of the protein and glyco component of the corona is then of utomost importance to fully understand the interactions with cellular receptors, biocompability and immunological reponse. [5]

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