Nanoassembly of the Protein Corona on Nanoparticles

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Abstract (Arial 10)
Cellular responses to materials in a biological medium reflect greatly the adsorbed biomolecular layer, rather than the material itself. Here, we study by molecular dynamic simulations the competitive protein adsorption on surfaces, i.e. the non-monotonic behavior of the amount of protein adsorbed on a surface in contact with plasma as a function of contact time and plasma concentration. We study the effects of different curvatures and nanoparticles size when the surface chemistry is the same [1].

References

[1] P. Vilaseca, K. A. Dawson, and G. Franzese, “Understanding and modulating the competitive surface-adsorption of proteins”, arXiv:1202.3796 (2012).

Figure: Simulation snapshot of a model plasma solution in contact with a nanoparticle (in the center). The model plasma is made of three different proteins (Albumin, Immunoglobulin-gamma, Fibrinogen) adsorbing on a hydrophobic nanoparticle and selfassempling in a protein soft corona.