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**Turning a foreign body into a smart nanoparticle**

When injected intravenously, large particles and agglomerates are retained by the capillary bed of lungs. Particles smaller than 5  $\mu\text{m}$  are able to circulate, but rapidly taken up by resident macrophages. This is a consequence of the fact that materials are foreign bodies and isolated from living tissues by non-specific protection mechanisms. These are initiated by proteins adsorption and changes of conformation, resulting in activation of the complement system and uptake by phagocytes. Interactions between nanoparticles and biological systems are surface-dependent phenomena and the specific surface area of nanoparticles is very high. Interactions with blood proteins can be modulated by the polymeric coating on the surface. Oligo- and polysaccharides are involved in masking, recognition and signalization phenomena of bacteria and viruses. A biomimetic strategy can be covering the surface of nanoparticles with bound polysaccharides. Complement activation, adsorption of blood proteins and circulation time in the bloodstream strongly depend on the type, structure and length of the polysaccharidic coating.