WP5: Biokinetics, Biodistribution, Cellular Uptake

The aim of WP5 is to provide information on the dependency of biokinetics, biodistribution, and cellular uptake of selected NMs on their physico-chemical characteristics in supporting the establishment of criteria for NM grouping. Biokinetics (accumulation characteristics) and biodistribution of selected NMs of various sizes and surface chemistries, in the various tissues of the rats (with emphasis on lung, liver, kidney, and spleen), are important parameters for risk assessment of NMs. The possibility to mimic the in vivo cell-nanoparticle interaction under in vitro conditions is expected to provide the possibility to correlate in vitro observations with in vivo ones. Based on published literature and additional experiments, a correlation between toxicological characteristics (inflammation, oxidative stress, genotoxicity) observed under in vitro and in vivo conditions by the same NM will be examined. Here we will assess the interaction of nanoparticles with rat aveolar and macrophage cell-lines, acting either on cell surface or intracellularlly following their uptake. Attention will be devoted to the time-dependent transformation of the NMs due to aggregation and agglomeration, as well as to the possible uneven distribution of the NMs in the extracellular medium because of possible precipitation. The mechanisms of the uptake process will be addressed.

WP5 tasks:

- Task 1 - Biokinetics, Biodistribution
- Task 2 - In vitro/ in vivo correlation
- Task 3 - Cellular Uptake, Uptake mechanisms