PC 71

STUDY OF ADSORPTION OF BOVINE SERUM ALBUMIN ON POLY(ISOBUTYL CYANOACRYLATE) NANOPARTICLES BY SMALL-ANGLE NEUTRON SCATTERING

C. Vauthier[a, b], P. Lindner[c], B. Cabane[d]

[a]*UMR CNRS 8612, Univ. Paris-Sud, F-92296 Chatenay-Malabry, France*
[b]*Univ. Paris-Sud, UMR CNRS 8612, F-92296 Chatenay-Malabry, France*
[c]*ILL BP 156, 38042 Grenoble Cedex, France*
[d]*PMMH, CNRS UMR 7636, ESPCI, 10 Rue Vauquelin, 75231 Paris Cedex 05, France*

In vivo, adsorption of proteins is generally the first event that occurs when foreign materials enter biological fluids. This initial phenomenon is one of the most important barriers that control the fate of nanoparticle drug carriers after intravenous administration. There is a need to investigate the mechanism by which a protein adsorbs on the nanoparticle surface, in order to better understand how to design nanoparticles with optimal surface properties. The aim of our work was to investigate how a model protein adsorbed onto the surface of dextran-coated poly(isobutylcyanoacrylate) (PIBCA) nanoparticles. The nanoparticles selected in this work are currently developed as drug carriers and are known to accumulate in the liver after intravenous administration.

We used Small Angle Neutron Scattering (SANS) to determine the locations of bovine serum albumin (BSA) adsorbed on the dextran-coated nanoparticles. The results show that the proteins are adsorbed on the PIBCA core of the nanoparticles, in a flat configuration, at locations which are free of dextran. As a result, the nanoparticle surface can be described as a mosaic with patches of adsorbed BSA separated by areas covered by dextran chains.