

O39. DISTRIBUTION AND CHARACTERIZATION OF TOXIC METALS IN HUMAN SPECIMEN

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Aim: Tattoo pigments have been widely investigated in ink products. In contrast, little data is available on the pigment particles once injected into the skin and after migration to the lymph nodes. We here investigated the pigment identities and biomolecular alterations in the tissue surrounding the particles in skin and lymph node of donors without known symptoms.

Methods: Each four human skin and lymph node sections were analyzed by means of synchrotron X-ray fluorescence and FTIR microscopy techniques at the beamline ID21 and ID16B at ESRF.

Results: TiO₂ pigments were co-localized with bromine (Br) deriving from an organic green pigment in skin and regional lymph nodes. Average TiO₂ particle size in skin and lymph nodes was 180 nm. Organic Br-containing pigments were much more polydisperse with particles sizes presumably below 50 nm and up to several micrometers; with smaller particles preferentially found in the lymph nodes. Fe-containing particles were slightly smaller compared to TiO₂. The FTIR assessment of dermis sections that contained pigment particles showed higher amid I β -sheet/ α -helix ratios compared to dermis without pigment particles.

Conclusions: The results suggest a preferential transport of smaller particles towards the lymph nodes. The conformational changes of proteins towards β -sheets in the proximity of the particles indicate protein misfolding.

Protein misfolding as seen here are known to occur as an initial step in the onset of a foreign body granulomatous reaction as often associated with tattoos. Differentiation between the particle characteristics that drive biocompatibility or rejection of the particles in the skin is part of ongoing research.