P4

INFLUENCING THE IMMUNE RESPONSE OF THE SKIN TO TATTOO PIGMENTS BY CONTROLLED LAYER BY LAYER ENCAPSULATION

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The Layer by Layer (LbL) technology allows the alternating deposition of polycations and polyanions (polyelectrolytes) in films of nanometer thickness on planar and colloidal surfaces.[1,2] Due to the large number of commercially available polycations and polyanions the surface properties of the coated materials can be widely varied and functionalized. In order to control the surface properties of tattoo pigments several typical inorganic and organic pigments were encapsulated with different polyelectrolyte compositions. The deposition of the polyelectrolytes changed and unified the surface properties of the different pigments like the surface charge (Zeta-potential) and the chemistry without remarkable changes of size or colour.

These surface properties play an important role by the recognition and bioclearance of the pigments by the immune system of the skin. In order to get more insight in possible processes in the skin we studied the interactions between human phagocytes and differently LbL coated microparticles. The obtained data allowed us to draw some conclusions concerning an optimal coating of dye pigments in order to achieve good biocompatibility and long term stability in the skin,

Furthermore we will show by means of some examples which other consequences the LbL encapsulation can have for the further improvement and application of tattoo pigments.

1) Gero Decher et.al. Langmuir 1991

2) Claire Peyratout et.al. Angew. Chem. Int. Ed. 2003