

**TATTOO INK TOXICOLOGY, THE KNOWN, THE UNKNOWN AND THE SCIENTIFIC CHALLENGE OF THE FUTURE****Wolfgang Bäuml<sup>1</sup>***<sup>1</sup>Department of Dermatology, University of Regensburg; (Regensburg, Germany)*

Tattoo colorants contain water insoluble pigments that are inorganic or organic, coloured, white or black materials. In the past decades, tattooists used inorganic pigments that contained heavy metals such as mercury, chromium or cadmium. Two important inorganic pigments are still in use: carbon black for black tattoos and titanium dioxide (white).

Nowadays, the coloured tattoo colorants mainly consist of organic pigments like azo or polycyclic pigments, which are usually taken from the chemical industry. Although being injected in the human body, tattoo colorants usually fulfil no safety requirements comparable to other pharmaceutical substances. It is important to note that a fraction of the colorant stays in the dermis as particles causing the colour of the tattoo while an unknown fraction of the injected colorant is removed from the skin via lymphatic system staining lymph nodes at least.

Beside the colouring compound (black, red, green, blue, etc.), the colorants may contain various other substances depending on the methods by which the colorants are produced. Such colorants comprise educts, products, and by-products of the respective colouring compound, different solvents and even preservatives. The tattoo colorants may also contain various impurities that got accidentally into a colorant for unknown reasons. Thus, tattoo colorants usually exhibit a complex mixture of various chemical compounds.

At present, the list of identified admixtures and impurities in tattoo colorants is rather incomplete. Most of the tattoo colorants are manufactured for other intended uses and both, black and coloured tattoo inks may not have an established history for safe use in humans including the skin and human body. The ingredients of tattoo colorants should be analysed and controlled via negative list to avoid harmful substances.