

**O24. ADVERSE TATTOO REACTIONS - ANALYSIS OF HUMAN BIOPSIES**

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**Aim:** Allergic reactions to tattoos are most commonly observed with red color shades. However, the chemical identity of these colors is usually not reported. Sensitizing elements such as Ni, Cd, Mn and Co as well as organic pigments have been associated with tattoo allergies. However, analytical evidence of the pigments in the skin or inks provided by the tattooist is often not available.

**Methods:** We screened 104 skin biopsies of patients who have developed an allergy against their red or violet tattoo. Specimens were analyzed for potential sensitizing elements using inductive-coupled plasma mass spectrometry (ICP-MS). Organic pigments were identified by matrix-assisted laser desorption/ionization time-of flight (MALDI-ToF)-MS/MS.

**Results:** About half of the samples contained Cr, Ni or both elements. The azo-pigments red (P.R.)22, P.R.170, P.R.210, pigment orange 13 and the dioxazine pigment violet 23 occurred more often in the skin samples compared to their general use in tattoo inks. Other pigments identified belonged to the quinacridone family of pigments.

**Conclusion:** Elements found in samples from tattoos occasionally might play a role in tattoo allergies. However, organic pigments are suspected to play a major role. The identified organic pigments should be further evaluated for their sensitizing properties. However, such insoluble pigments are generally non-reactive by patch tests<sup>1</sup>. Yet, some pigment decomposition products are known sensitizers (unpublished data). Therefore, future experiments will focus on the sunlight and laser decomposition products of the found pigments which will be tested by the direct-peptide reactivity assay (DPRA) to identify the true sensitizing compound(s).

<sup>1</sup> Serup, J. & Hutton Carlsen, K. Patch test study of 90 patients with tattoo reactions: negative outcome of allergy patch test to baseline batteries and culprit inks suggests allergen(s) are generated in the skin through haptization. *Contact Dermatitis* 71, 255-263 (2014).'