Inflammatory and genotoxic effects of sanding dust generated from nanoparticle-containing paints and lacquers

Nanoparticles are increasingly used in paints and lacquers. Little is known of the toxicity of nanoparticles incorporated in complex matrices and released during different phases of the life cycle. DNA damaging activity and inflammogenicity of sanding dust sampled during standardised sanding of boards painted with paints with and without nanoparticles were determined 24 h after intratracheal instillation of a single dose of 54 μg in mice. Dusts from nanoparticle-containing paints and lacquers did not generate pulmonary inflammation or oxidative stress. Sanding dust from both the nanoparticle-containing and the conventional lacquer and the outdoor acrylic-based reference paint increased the level of DNA strand breaks in bronchoalveolar fluid cells. In conclusion, addition of nanoparticles to paint or lacquers did not increase the potential of sanding dust for causing inflammation, oxidative stress or DNA damage, suggesting that the paint/lacquer matrix is more important as determinant of DNA damage than the nanomaterial.

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