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The detrimental effects of Human exposure to Pollutants: in-vitro studies and correlation with increased hair structure degradation**Thomas Bornschlögl***R&I Advanced Research, L'Oréal*

With the rise of industrialization, air pollution via phototoxic polycyclic aromatic hydrocarbons (PAHs) became a major risk factor for human health. In-vitro observations suggest a detrimental effect of PAHs for human health even at very low doses in combination with UVA exposure. While some in-vivo correlations corroborate these findings, overall in-vivo observations of the structural impact of PAHs on biological tissue are rare. We use transmission electron microscopy on human hair fibers collected from 200 volunteers living in two different cities with different air pollution exposure. A first analysis showed that fibers from the more polluted city (Baoding, figure B) show more internal structural damage of the fiber as compared to fibers from the less polluted city (Dalian, figure A). The quantification of internal defects (Figure C) together with an exact quantification of 25 biomarkers for PAH exposure in all fibers allowed to show an increased structural degradation of the hair fiber over time, when increased PAH concentrations are present (Figure D)

Biography

Thomas Bornschlögl received his PhD in Munich in the area of biophysics, performing single molecule force spectroscopy experiments that gave insight in the thermodynamics of protein folding and the working mechanisms of molecular motors. He later on pursued his research on biomechanics and mechano-biology at the Institute Curie in Paris working on bacterial infection pathways and force induced cytoskeletal reorganizations. Today he is the head of the imaging platform within the advanced research division of L'Oréal, where he uses different microscopy approaches to better understand the biophysics of skin and hair.

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