

Microplastics detected in human lung tissue and BALF using μ Raman Spectroscopy

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In recent years, there has been an increase in reports on atmospheric microplastics (MPs), which have been detected not only in urban areas but also in remote areas.

It is still unknown whether atmospheric MPs are inhaled, deposited and accumulated in the human lung. In this study, we first examined whether atmospheric MPs are present in lung tissue and BALF. The experimental samples consisted of 5 air samples, BALF of 5 patients, lung tissue of 5 patients and procedure blank. A total of 20 samples were analyzed according to the final protocol. A reliable method for detection of MP particles under 10 μ m in these samples was developed. Chemical digestion of these samples, staining with Nile red, subsequent fluorescent microscopy with identification of MPs size by ImageJ and μ Raman spectroscopy were performed. Morphology, particle size distribution and composition of MP polymers were assessed. The morphology was present in both fibers and fragments, with the majority being less than 10 μ m. Of the MPs detected, 10 polymer types were identified with polyethylene terephthalate (PET) and polystyrene (PS) the most abundant.