Detection and analysis of nanoparticles in human cell

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The rapid explosion of production and use of nanoparticles has outpaced the ability of the scientific community to monitor their presence in the environment. Without measurement data, it is not possible to fully assess whether the promises of nanoparticles is accompanied by significant environmental or health risks [1]. Toxicity depends on particle size, shape and chemical composition. A nanomaterial is a substance that measures less than 100 nm in any one of three dimensions that is 100 to 1000 times smaller than most living cells, it is difficult to observe or to detect. Nanomaterials can be all types of shapes: amorphous, rods, wires, sheets, spheres, horns, dendrimers etc. This large amount of area presents many surfaces that can interact with, and possibly interrupt, normal cellular physiological mechanisms [1-3]. Nanomaterial may pose the greatest risk to the lung because they can be transported like a gas and reach the deepest portion of the lungs, the alveoli. One of the biggest challenges in solving the puzzle of the toxicity of nanotechnology will be to evaluate the toxicity of nanomaterials to the respiratory system [3, 4].

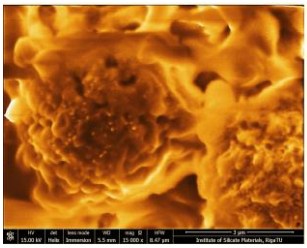

Figure 1. Nova NanoSEM 650 image of human epithelium cell uptake with nanoparticles for metallurgy workers (bar: 3 µm).

In this study scanning electron microscopy is used to form images and analyze epithelium cell uptake (released from nasal lavage) with nanoparticles in working places: metallurgical, wood productions and office (control group) according to project "The development of up-to-date diagnostic and research methods for the risks caused by nanoparticles and ergonomic factors at workplaces", project Nr. 2013/0050/1DP/1.1.1.2.0/13/APIA/VIAA/025.

References

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