

Cell damage induced by asbestos similar particles

Michela Battistelli¹ - Sara Salucci¹ - Michele Mattioli² - Michela Cangiotti² - Matteo Giordani² - Maria Francesca Ottaviani² - [Elisabetta Falcieri](#)¹

¹ DISB, Dipartimento di Scienze Biomolecolari, Università degli Studi di Urbino Carlo Bo, Urbino, Italia - ²

DISPEA, Dipartimento di Scienze Pure ed Applicate, Università degli Studi di Urbino Carlo Bo, Urbino, Italia

The presence, in nature, of asbestos similar particles, highly toxic and potentially cancerogenic for human healthy is well known (1). Inhalation of the fibrous form of erionite, has been shown to cause effects compared to those observed with mineral fibers classified as “asbestos,” including malignant mesothelioma, a disease typically associated with occupational and environmental exposures to asbestos (2). In this work various zeolite materials have been considered because of their suspected carcinogenic activity and, the possible interactions occurring between asbestiform fibers and U937 cell, a human hemopoietic cell line, have been evaluated. Chemical and morpho-functional analyses have been carried out, both to characterize fiber structure and cell response. Cells showed the ability to internalize the minerals, as observed after TEM analyses. With zeolite exposure time increasing, a diffuse cell damage with features of apoptotic and necrotic death can be evidenced (3). These findings suggest that the fibrous form of scolecite or offretite too can be considered potentially toxic for cell culture in vitro.

References

- [1] Mattioli et al. (2016) Morpho-chemical characterization and surface properties of carcinogenic zeolite fibers. *J Hazard Mater.* 306:140-8. doi: 10.1016/j.jhazmat.2015.11.015.
- [2] Van Gosen et al. (2013) Geologic occurrences of erionite in the United States: an emerging national public health concern for respiratory disease. *Environ Geochem Health.* 35(4):419-30. doi: 10.1007/s10653-012-9504-9.
- [3] Salucci et al. (2014) Melatonin prevents chemical-induced haemopoietic cell death. *Int J Mol Sci.* 17;15(4):6625-40. doi: 10.3390/ijms15046625.

Keywords

Asbestiform fiber; U937 cells.