Conclusions Considering that the mineralogy is constant, the decreasing rate of toxicity suggests that the hazardous potential must be attributed mainly to the single fibres, while the agglomerated fibres, whose amount increases strongly for increasing total fibres play a minor role.

1333 TIO$_2$ AND TIO$_2$-MESOPOROUS SILICA NANOPARTICLE TOXICITY EVALUATED ON PRIMARY HUMAN PERIPHERAL BLOOD MONO/LYMPHOCYTES

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Introduction TiO_2-NPs are the most produced nanomaterial as UV filters. They are considered as nontoxic at the exposure levels of the occupational environments; nevertheless, potentially dangerous organic molecules can be formed due to photocatalysis. Mesoprous silica (SiO_2) nanoparticles (MSN) incorporating Ti-nano were produced to improve their properties. We studied whether human lymphocytes/monocytes can be the target of a toxic action of all these NPs.
Methods Activated/quiescent huPBMCs were exposed *ex-vivo* to: TiO_2-NPs (21 nm); MSN (100 nm); TiO_2-MSN (4.4 nm TiO_2 into MSN pores). They were characterised for: cell viability/apoptosis by MTT and Annexin-V; ROS by DCFH oxidation; nuclear morphology by fluorescence microscopy; cytokines by ELISA.
Results The viability of activated lymphocytes exposed to the highest doses all NPs was significantly reduced. All NPs induced apoptosis, but only TiO_2-NPs induced ROS. IL-2, IL-17, IFN-g were downmodulated by all; MSNs were associated with increased IL-1β and IL-4 secretion; TiO_2-NPs induced IL-10, TNF-α and IL-23.
Conclusion Different patterns of cytokine in response to the three different NPs tested: they are all immunosuppressive, but only TiO_2-MSN seem to act as pro-inflammatory and pro-allergic agents. The presence of TiO_2 in MSN appear to influence the effects of these larger NPs, possibly related to its pro-oxidative and pro-apoptotic effect.

136 OCCUPATIONAL EXPOSURE TO IMMUNOTOXICANTS AND SOLAR RADIATION IN THE FRAMEWORK OF THE ONGOING CLIMATE CHANGE: ANOTHER STEP IN EXPOSOME PROFILING

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Introduction Immunotoxicants may interfere with one or more mechanisms involved in the elicitation of the immune response. Occupational exposure to solar radiation may exert an immunosuppressive effect, both locally and systemically, while the ongoing climate change may alter the occupational exposure to both solar radiation and a number of immunotoxicants.
Methods Literature review on occupational exposure to immunotoxicants as well as to solar radiation and climate change.
Results Metals, solvents, some pesticides and other categories of chemicals currently used in or released by working processes are immunotoxic. Outdoor workers may be simultaneously exposed to both immunotoxicants and solar radiation. Moreover, a changing climate may increase or, depending on some factors involved, decrease the occupational exposure to both immunotoxicants and solar radiation. The net effect on the overall immune response is difficult to predict, depending on the combination and levels of the exposures involved and the outcome considered (for instance immune response to pathogens vs allergic/sensitisation reactions).
Discussion The protection of outdoor workers from the effects due to combined exposure to immunotoxicants, solar radiation and variables connected to climate change needs a careful assessment of all the factors involved, having care to acquire the immune profile of the worker during the health surveillance, through both conventional and innovative approaches. In addition, co-exposure to chemical or physical agents (e.g. irritants, sensitizers, high temperatures and humidity) modulating the effect/s of a given level of exposure to a single immunotoxicant or to a combination of immunotoxicants has to be taken into account. As a perspective, the implementation of this topic may contribute to define the 'exposome' of important categories of outdoor workers.

147 HANDLING AND DISPOSAL OF AGRICULTURAL CHEMICALS ON A2 FARMS IN CHIRUMHANZU DISTRICT

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In 2000 the Government of Zimbabwe undertook a massive land redistribution programme under its black economic empowerment policy where white-owned farms were seized and sub-dividing into smaller A1 and A2 models and redistributed to landless black majority. However, most of the land beneficiaries were ill-resourced and ill-trained to use the land in an ecologically friendly manner. This paper investigated how newly resettled farmers handled and disposed agricultural chemicals on the acquired A2 farms. In-depth interviews and observation where the main data collection instruments. The study involved farm employees on A2 farms that use agrochemicals to enhance farm productivity. A total of 150 respondents participated in the study. The findings of this study indicated that despite the availability of statutory provisions on handling and disposal of agricultural chemicals, there is rampant mismanagement of environmentally unfriendly chemicals on the farms. Although most of the employees on the farms are literate, they find it difficult to understand the technical jargon used on these chemical labels. The study also established that agricultural chemicals are vital in sustaining Zimbabwe's agricultural sector in terms of food security, foreign exchange generation, employment and provision of raw material for the manufacturing sector. On the other hand mismanagement of these chemicals can have adverse effects on human beings and the environment. It is therefore, important for farmers and their employees to be trained on personal, public health and environmental implications of poor management of agricultural chemicals. The paper recommends that the Zimbabwean Government should adopt a multi-sectoral campaigns strategy against mismanagement of agricultural chemicals. Use of electronic and print media of communication through the local languages is also recommended.