EFFECT OF ASBESTOS ON FOXP3 EXPRESSION IN HUMAN T CELL LINE MT-2

Introduction Asbestos fibres cause mesothelioma and lung cancer. We propose that asbestos suppress anti-tumour immune system in addition to transformation of mesothelial and lung epithelial cells. It is considered that regulatory T cells, Treg produce inhibitory cytokines to suppress immune reaction against tumour cells. We employed human T cell line MT-2 cell as a model of Treg and cultured them with low concentration of asbestos for 8 months. MT-2 cells exposed with low-concentration asbestos for long term showed higher viability after treatment with high lethal dose of asbestos than original MT-2 cells, and they were designated as MT-2Rst. However, it is still unclear how asbestos induces apoptosis of MT-2 cells and molecular basis of resistance of MT-2Rst cells to high concentration of asbestos.

Methods We analysed the regulation of FoxP3 transcription in MT-2Org and MT-2Rst cells using luciferase reporter plasmids containing promoter sequence of FoxP3 gene.

Result There was no significant difference in FoxP3 reporter activity between MT-2Org and MT-2Rst cells.

Discussion Our result indicates that long-term exposure with asbestos suppressed FoxP3 transcription through the epigenetic modification, such as DNA methylation.
microstructures of monocytes were observed by TEM and SEM, and titanium was identified by energy dispersion type X-ray spectroscopy (EDX). Adherent monocytes were pre-cultured with Alexa 568 dextran (A-Dex) to visualise endosomes. Results: TNS exposure induced apoptosis of PBMC in the 7 days culture, the dose dependency of which was similar to asbestos, although apoptosis was not induced at the early stage of day 2 unlike asbestos. The apoptosis was inhibited by Q-VD-OPh pan-caspase inhibitor. Isolated CD4+ T cells as well as monocytes showed apoptosis caused by TNS exposure, whereas monocytes showed giant vacuole formation prior to apoptosis. TNS-like compounds in vacuoles were observed by TEM, and SEM images showed rough surface of the inner layer of vacuolar membrane, in which titanium was identified by EDX. Most of vacuoles showed co-localization with fluorescence of A-Dex.

Conclusion: These results indicate that TNS have toxic effect to cause caspase-dependent apoptosis of immune cells. In particular, TNS showed characteristic toxicity for monocytes, in which engulfed TNS were thought to enter into the endosomal pathway, leading to vacuole formation followed by apoptosis. Those findings suggest hazardous risk of occupational exposure to TNS.

Introduction: Pollen allergy is major problem in Japan. The custom-homebuilding company, Cosmic Garden Co. Ltd., located in Okayama City, Japan was established in 1997 and uses specific natural ore powder (SNOP) in wall materials to improve allergic symptoms. In this study, we surveyed biological effects of short term stay in a room surrounded by SNOP cloth.

Methods: To investigate the biological effects of SNOP patients with a pollen allergy were recruited to stay in a room surrounded by cloth containing SNOP (CCSNOP), and then symptoms and various biological parameters were compared with those of individuals staying in a room surrounded by control non-woven cloth (NWC). Each stay lasted 60 min. Before and immediately after the stay, a questionnaire regarding allergic symptoms, as well as POMS (Profile of Mood Status) and blood sampling, was performed. Post-stay minus pre-stay values were calculated and compared between CCSNOP and NWC groups.

Results: Results indicated that some symptoms, such as nasal obstruction and lacrimation, improved, and POMS evaluation showed that patients were calmer following a stay in CCSNOP. Relative eosinophils, non-specific Ig E, epidermal growth factor, monocyte chemotactic protein-1, and tumour necrosis factor-α increased following a stay in CCSNOP.

Conclusion: This ore powder improved allergic symptoms, and long-term monitoring involving 1 to 2 months may be necessary to fully explore the biological and physical effects of SNOP on allergic patients.