AIT Free of Charge Webinar Sessions 2023

The Association of Inhalation Toxicologists (AIT) committee is pleased to confirm that we will be running free of charge virtual webinar sessions again this year and early next year, during October/November 2022 and January/February 2023 (1 hour WebEx session per talk, details are below). Details of the remaining webinar sessions are below.

Please register your interest in attending each session by emailing the webinar organiser Kay Rush at aitoxicology@gmail.com. Links to join each session will be sent to people that are registered.

Sponsorship:

The AIT thanks our sponsors for assisting us in hosting these free of charge webinar sessions:

The British Toxicology Society (BTS) has sponsored all the 2022 and 2023 webinar sessions. https://www.thebts.org/

Cerulean sponsored one webinar session (completed 2022). https://www.cerulean.com/en

In-Tox Products sponsored one webinar session (completed 2022). https://intoxproducts.com/

VJO Canada Inc. sponsored one webinar session (completed 2022). https://www.vjocanada.com

Please see the remaining webinar session details below.

WEBINAR SESSIONS 2023:

1. Diane Stannard (LabCorp): – Due to unforeseen circumstances this webinar has been rescheduled to **Wednesday 22nd February 2023 at 14:00 to 15:00 GMT (09:00 to 10:00 EST). Sponsored by the British Toxicology Society (BTS).**

   Juvenile toxicology talk.

   Details to follow.

2. Tobias Stoger (Helmholtz, Germany): – **Monday 27th February 2023 at 15:00 to 16:00 GMT (10:00 to 11:00 EST). Sponsored by the British Toxicology Society (BTS).**

   Lung single cell transcriptomics to guide the development for AOP anchored-cell based assays in response to nanoparticle exposure.

   Inhaled nanoparticles (NP) can cause acute and chronic inflammation. Here we seek to identify NP-specific cellular perturbation pathways and the underlying key cell types to inform adverse outcome pathway (AOP) anchored *in vitro* studies, by single cell transcriptomics. We exposed mice intratracheally to carbon black (CNP), tangled double-walled (DWCNT) and rigid, multi-walled carbon nanotubes (MWCNT). All lungs underwent single-cell RNA sequencing (scRNA-seq), histology and BAL analysis.

   At the chosen doses all NPs caused comparable airspace neutrophilia at 12h, which increased until d6 for the CNTs but remained elevated until d28 only for MWCNT, indicating the key event (KE) acute and chronic inflammation. Comparing scRNA-seq and BAL cytokine levels at 12h, NPs specifically differentiated the fate of inflammation. In agreement with airspace neutrophilia, CNP uniquely triggered GM-CSF and CXCL1 protein release, with Csf2 and Cxcl1 mRNAs being expressed mainly in alveolar epithelial cells. DWCNT caused CCL2, -3 and -4 release involving interstitial macrophages and monocytes, associated with high BAL macrophage numbers at d6 in turn. MWCNT in contrast caused an ample BAL cytokine increase involving different cell types and specifically caused a Th2 cytokine response (CCL11, IL10), a crucial KE of fibrosis AOPs. Cell communication analysis uncovered an early (12h) distinct signaling centered around alveolar macrophages only for DWCNT, and between epithelial cells, adjacent fibroblasts and monocyte derived phagocytes for CNPs, whereas MWCNT triggered a broad network including epithelial cells, fibroblasts, macrophages, dendritic cells and endothelial cells.

   Our study uncovers early NP-specific cell perturbations and identified first specific cellular response pattern which can guide AOP predictive cell-based testing strategies. Further analysis of the cellular dynamics shall enhance our understanding of NP specific cell circuits and related pathologies.

3. Otmar Schmid (Helmholtz, Germany): – **Monday 6th February 2023 at 15:00 to 16:00 GMT (10:00 to 11:00 EST). Sponsored by the British Toxicology Society (BTS).**

A New Look at Aerosol Deposition, Dosimetry and Biokinetics of Nanoparticles in the Lung.

Background: Understanding the dynamic process of spatially resolved particle deposition and subsequent particokinetics in the lung is of utmost importance for therapeutic and toxicological nanoparticle applications. In this webinar we present new insights into these aspects leveraging the unique capabilities of two recently introduced in vivo/ex vivo imaging techniques for spatially resolved monitoring of nanoparticle dose in non-dissected murine lungs.