



AIT Free of Charge Webinar Sessions 2022

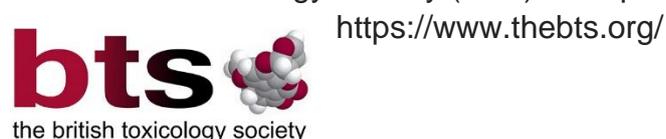
The Association of Inhalation Toxicologists (AIT) committee is pleased to confirm that we will be running free of charge virtual webinar sessions again this year during October/November 2022 (1 hour WebEx session per talk, details are below).

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 webinar sessions.



Cerulean has sponsored webinar session 6. <https://www.cerulean.com/en>



In-Tox Products has sponsored webinar session 1. <https://intoxproducts.com/>



Other sponsors are very welcome. Please contact the AIT at aitoxicology@gmail.com for details.

Please see the following webinar session details.

WEBINAR SESSIONS 2022

1. Alice McNamara (LabCorp) – **Monday 10th October 2022 at 15:00 to 16:00 GMT (10:00 to 11:00 EST).**

Refinements in Minipig Inhalation Toxicology

Minipig inhalation is an emerging field in toxicology due to their homology to humans. In this webinar, Alice McNamara MRCVS from Labcorp will share how the Labcorp team has successfully completed several regulatory toxicology studies using this model, and have implemented multiple welfare refinements including:

- Training. Design of a bespoke positive reinforcement training protocol to acclimatise animals to staff, training them to walk in a harness to the dosing suite and then tolerate wearing a mask for up to 120 minutes/session.
- Physical environment. From 3D printing masks in a variety of sizes to give a comfortable fit and minimise dead space, to optimising the dosing suite for pig comfort with tactile, auditory and olfactory enrichment, the environment of the dosing suite allowed animals to calmly settle and even fall asleep during dosing procedures.
- Safety monitoring. The safety of the animals is paramount in any study, so capnography and visual scoring to monitor the animals continuously was employed.

2. Jessica Murray (U.S. Environmental Protection Agency) – Due to unforeseen circumstances this webinar has been rescheduled to **Tuesday 29th November 2022 at 15:00 to 16:00 GMT (10:00 to 11:00 EST).**

Development of an aerosol-compatible cell culture exposure system and its application to quantify cellular uptake of particles at the air-liquid interface.

Inhalation is the one of the three primary modes of chemical exposure; however, significant challenges in developing dosimetry methods, reproducible exposure systems, and appropriate *in vitro* models have led to its vast underrepresentation in EPA's Tox21 initiatives. To meet screening demands for a diverse range of inhaled toxicants, we utilized fluorescent tracers and Computational Fluid Dynamics (CFD) modeling to develop an Aerosol-compatible Cell Culture Exposure System (ACCES) which achieves serial dilution of aerosols and volatile compounds at ALI. CFD modeling was a valuable tool to optimize operational parameters, while aerosolized fluorescein and rhodamine allowed us to quantify deposition throughout the ACCES. Both fluorescent tracers revealed that cell-free matrices may not accurately predict cell deposition and should be used with caution. Furthermore, we compared cellular uptake of fluorescent tracers delivered at ALI or by direct-dosing in human bronchial epithelial cells (pHBEC, 16HBEs) given that re-submersion of ALI cultures is often proposed as a time- and cost-effective alternative to ALI exposures. We found that the delivery method affects cellular uptake,

basolateral transport, and mucus retention of fluorescein and rhodamine. Together, these data highlight the need for improved analytical assays to support *in vitro* inhalation assays and suggest that direct-dosing studies may not be equivalent to ALI exposures. [Abstract does not reflect views or policies of the U.S. EPA.]

3. Andreas Stucki (PETA Science Consortium International e.V.) – **Thursday 10th November 2022 at 15:00 to 16:00 GMT (10:00 to 11:00 EST).**

In vitro systems to predict respiratory toxicity (INSPIRE Initiative) – a proof of concept study to test silanes using human cell-based systems.

In 2007, the US National Academy of Sciences introduced a novel approach to assure the safety of chemicals based on human-relevant mechanisms of toxicity in their landmark publication “Toxicity Testing in the 21st Century: A Vision and a Strategy”. The vision detailed “a not-so-distant future in which virtually all routine testing would be conducted in human cells or lines *in vitro*”. Many tools for *in vitro* respiratory toxicity testing have become available in recent years, including new human cell-based models and exposure systems. Because of these technological and biological advances and the limited ability of animal tests to predict human effects, multiple efforts are ongoing to develop human-relevant approaches to characterize potential portal-of-entry effects of inhaled substances. This webinar will provide highlights from the work being conducted under the INSPIRE Initiative [*in vitro* systems to predict respiratory toxicity] the goal of which is to show how *in vitro* systems can be used to predict respiratory toxicity of inhaled chemicals in humans and inform regulatory decision-making. Four chemicals from two distinct chemical classes (silanes and surfactants) are assessed in two different cell systems (BEAS-2B cells and MucilAir™) using various exposure scenarios and biological endpoints. This presentation will focus on the decisions made for the study design, the results from silane testing, and the lessons learned.

4. Chang Guo (UKHSA) – **Monday 14th November 2022 at 15:00 to 16:00 GMT (10:00 to 11:00 EST).**

The validation of the AE-ALI system for nano aerosol exposure in human relevant culture models.

Air pollution is one of the greatest environmental risks to public health. To facilitate more realistic hazard identification, especially for inhalable particulate matter and engineered nanomaterials, we have established an aerosol exposure air-liquid-interface (AE-ALI) system (Cultex™). Whilst offering potential benefits in terms of more realistic hazard identification, this AE-ALI system can be complex to operate and the results sensitive to details of set-up and operating parameters. As such, detailed characterization of the system, including assessing the effects of electrostatic precipitator voltage, aerosol flow rate, size of Transwell inserts, and exposure duration on cytotoxicity (LDH), was carried out using human lung alveolar (A549) and primary small airway epithelial cells to ensure robust and repeatable results. The primary small airway epithelial cells were used to explore for any further

adverse effects such as oxidative stress, inflammatory responses, and DNA damage. The results indicated that exposure duration had a significant impact on cell cultures (e.g. increased expression of selected genes including CXCL1, HMOX1, SPP1 etc). The effect of system parameters on nanoparticle (NP) aerosol deposition patterns was also explored using a CeO₂NP aerosol and laser ablation ICP-MS. The results show that appropriate choice of operating parameters could produce broadly uniform deposition. Results from this study indicate that detailed characterisation of AE-ALI systems is essential prior to use.

5. Shannon Krieger (Dow Chemical Company) – **Thursday 17th November 2022 at 15:00 to 16:00 GMT (10:00 to 11:00 EST).**

New computational profiling approaches to identify inhaled sensory irritants

Details to follow.

6. Stephan Goldman (Kaycha Labs, USA) – **Monday 21st November 2022 at 16:00 to 17:00 GMT (11:00 to 12:00 EST).**

Cannabinoids: What are they, how are they made, used, and tested.

Cannabinoids are a diverse set of biomolecules with a colorful regulatory history. Currently in the USA, states have the right to legalize adult use (recreational) and/or medicinal use markets. Cultivation and manufacturing licenses are granted to grow and produce a very wide variety of products for sale in each state. There are as many different manufacturing options as there are different strains of cannabis sativa, each with its own set of risks and rewards. This talk will cover a brief introduction of cannabinoids, manufacturing, product use, and how Kaycha Labs tests these products.

7. Diane Stannard (LabCorp):) – **Tuesday 22nd November 2022 at 14:00 to 15:00 GMT (09:00 to 10:00 EST).**

Juvenile toxicology talk.

Details to follow.