

# CROSS-INDUSTRY Organizations

## The Association of Inhalation Toxicologists (AIT): Activities since 2020 and future plans

Jo Kilgour, PhD, on behalf of the Association of Inhalation Toxicologists (AIT)

### Aims of the AIT

The Association of Inhalation Toxicologists (AIT) aims to promote open discussion, exchange of ideas and presentation of high-quality scientific research in inhalation toxicology at our virtual webinars and annual in-person conference. Attendees from varied backgrounds reflect the diversity of people with a shared interest in the many specialized aspects of the practice and interpretation of inhalation toxicology studies. The AIT is also seen as an excellent training ground for individuals beginning a career in this field.

### A brief history

The AIT was founded in the United Kingdom in the 1970s by a group of individuals who recognized the need for a forum to discuss inhalation toxicology and the associated technological challenges. Growing in reputation and evolving into an international organization, the AIT committee now includes representatives from the UK, mainland Europe and North America. The AIT has formed strong links with other societies that have common interests, holding two joint conferences; one with The International Society of Aerosols in Medicine (ISAM) and a second with The British Society of Toxicological Pathology (BSTP); as well as holding sessions on inhalation toxicology at the British Toxicology Society (BTS) annual meetings. Conference subjects have

included inhaled nano-toxicology, lung pathology with inhaled medicines (including biologics), clinical development, translational models, *in vitro* inhalation toxicology, e-cigarettes and updates on relevant regulatory guidelines. See a list of previous conferences on our website at [www.aitoxicology.org/conference-information](http://www.aitoxicology.org/conference-information).

### Principal activities

**Annual conference.** The location cycles among the UK, North America and Europe to facilitate ease of travel for attendees. The committee devotes extensive thought and planning to each event. A conference in Copenhagen, Denmark included a tour of the Ellegaard minipig facility. Visiting Research Triangle Park, North Carolina, US, allowed interactions with groups in the area that have an interest in inhalation toxicology (US Environmental Protection Agency (EPA); US National Institutes of Health (NIH); US National Institute of Environmental Health Sciences (NIEHS); North Carolina Society of Toxicology (SOT) Chapter). After a period without face-to-face conferences due to restrictions imposed by COVID-19, we held our first meeting in four years, May 3-5, 2023, in Gothenburg, Sweden. Topics included *in vitro* exposure systems, anatomical and physiological parameters for the respiratory tract across life stages, inhaled cannabinoids and general updates such as primate inhalation methods. Taking place at the AstraZeneca conference site

provided a great opportunity for delegates to tour the company's inhalation facilities.

**Free webinars.** Between 2020 and early 2023, when we could not meet in person, the AIT used online means of delivering Continuing Professional Development and opportunities to connect and interact. We received very positive feedback from attendees so the webinars will likely continue alongside the annual conference each year. Details about AIT webinars are available on our website at [www.aitoxicology.org](http://www.aitoxicology.org).

**Publications.** The published AIT papers can be seen on the AIT website at [www.aitoxicology.org/useful-publications](http://www.aitoxicology.org/useful-publications). One, in particular, has been influential and can be found in reference lists of most regulatory inhalation toxicology studies conducted today: Alexander DJ, et al., 2008: Association of Inhalation Toxicologists (AIT) working party recommendation for standard delivered dose calculation and expression in non-clinical aerosol inhalation toxicology studies with pharmaceuticals, *Inhalation Toxicology*, 20: 1179-1189. Recently, we have contributed to a published consortium paper in a special edition of *Toxicologic Pathology*. This was the culmination of an industry-wide survey (instigated, in part, by the AIT) on the "Technical, toxicological and PKPD considerations for conducting inhalation toxicity studies on biological pharmaceuticals" (<https://pubmed.ncbi.nlm.nih.gov/33535023/>).

This paper is accompanied by a sister paper coordinated by the BSTP and published in the same edition, “BSTP review of 12 case studies discussing the challenges, pathology, immunogenicity, and mechanisms of inhaled biologics” (<https://pubmed.ncbi.nlm.nih.gov/33455525/>).

**Workstreams.** The AIT has set up several workstreams, led by AIT committee members. These aim to increase our influence and potentially add to the publications contributed to or delivered by the AIT. The workstreams include:

- Encouragement of regulatory harmonization with respect to the calculation of safety margins for inhaled toxicity studies
- Assessing the pros and cons of varying exposure time vs. concentration to achieve desired doses in inhaled toxicity studies
- Looking at a) particle size determination—practical issues and b) ISO standards
- *In vitro* testing and new assessment methods (NAMs) in inhalation toxicology—currently a very hot topic across many industry sectors
- Assessing the development and testing of cannabinoid-containing inhaled products and the technical and regulatory difficulties faced in this growth area.
- Minipig inhalation—to scrutinize the choice of second species for inhaled toxicity studies; reviewing inhaled experiences in minipigs to establish state-of-the-art inhalation procedures in this species.

These workstreams collaborate inside and outside the AIT to produce output that can be published, hopefully influencing ways of working in the future (a core aim of the AIT).

**Future meetings.** For 2024, we are planning to visit North America for our face-to-face conference. We are discussing venues and topics, which may include wildfires and smoke inhalation toxicology,

nanomaterials/ultrafines, NAMs in inhalation toxicology and intranasal dosing. Updates will be posted on our website.

## Website and LinkedIn

We encourage you to visit the AIT website ([www.aitoxiology.org](http://www.aitoxiology.org)) and LinkedIn page ([www.linkedin.com/groups/13654177/](http://www.linkedin.com/groups/13654177/)) (currently with 145 members) to share information and latest advances, find opportunities to engage with members and take advantage of our free webinars and in-person annual conference, and please feel free to contact the AIT at [aitoxiology@gmail.com](mailto:aitoxiology@gmail.com).

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