Aerosol Characterization, Cytotoxicity, and Cilia Beating

Figure 2. Characterization of the CV-1/TH2.2 aerosol in the exposure system and assessment of cytotoxicity and ciliary beating

Conclusions

- Meta-analysis included functional measurements (cytotoxicity, ciliary beating functionality, and secreted pro-inflammatory mediator profiles) and advanced computational approaches (gene set analysis and causal network reconstruction) to comprehensively assess the biological impact of TH2.2 aerosol exposure on in vitro human bronchial, buccal, and nasal cultures.
- Demonstrated applicability of the Systems Toxicology approach to quantify and compare the effects of CS and TH2.2 aerosol exposure at the level of pertinent biological mechanisms, including cellular stress and pro-inflammatory responses, across multiple biological models.
- Demonstrated that the 21st century toxicology approach may further corroborate the robustness and reliability of organismic in vitro models with respect to the "3Rs" to reduce, refine, and replace animal testing.
- Exploited how targeted proteomics can strengthen the conclusions from other endpoints, including transcriptomics.
- Shown consistently across all in vitro models—bronchial, buccal, and nasal—that TH2.2 aerosol exposure had a considerably reduced and more transient biological impact on these in vitro models compared with equivalent nicotine concentrations.

References


Competing Financial Interest

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