

CROSS-INDUSTRY Organizations

An update on activities of the Drugs in the Lung Network



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On behalf of the Drugs in the Lungs Network

The Drugs in the Lungs Network was established to promote cross-company collaboration and develop academia-industry consortia. It operates as a subgroup of the Inhalation Focus Group of the Academy of Pharmaceutical Scientists (APS) of Great Britain. The network aims to provide regular, accessible, supportive forums for technical and scientific (i.e., data-rich) discussions, with the aim of advancing the knowledge and practice of early to late stage inhaled product development.

Results of prior conferences

The output from the 2012 workshop on induced macrophage responses to inhaled pharmaceuticals has now been published as “Challenges for inhaled drug discovery and development: Induced alveolar macrophage responses” in *Advanced Drug Delivery Reviews* 71: 15–33 (2014). This issue is relevant to all inhaled pharmaceuticals from simple to advanced delivery systems, with “difficult-to-interpret” preclinical findings presenting a challenge to drug development (Figure 1). The topic remains highly pertinent and was identified as a key “Crack It Challenge” by the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3R) in the UK in 2013. Pilot studies are being funded to develop translational tools to: (i) assess foamy macrophage modulation and inflammation in a longitudinal manner in preclinical studies and (ii) gain better insight into foamy

Figure 1

An electron micrograph of a macrophage after the inhalation of polyvinylacetate nanoparticles. Does the highly vacuolated appearance of this “foamy” macrophage represent an adverse reaction or is it an adaptive response to the inhalation of particles?



macrophage status and functionality as a response to drug inhalation. The prospect of following up the 2012 workshop to review progress in the field is being pursued by the Drugs in the Lungs Network in conjunction with the Immunotoxicology Working Group of the Health and Environmental Science Institute.

In September 2013, a mini-symposium on airway mucus at the APS UKPharmSci Conference focused on airway mucus and its influence on drug delivery via the respiratory tract. This included talks on the biology and chemistry of airway mucus, mechanisms of mucus secretion,

drug-mucus interactions and a panel discussion. The complexity of mucus and its potential to influence the disposition of drugs in the lungs was evident and there was much debate on ways that mucus may affect drug transport and dissolution in the lungs.

Future meetings

The Drugs in the Lungs Network is developing proposals for future workshops and symposia that address issues of scientific interest regarding the fate of drugs inhaled in the lungs.

A workshop on modulating pharmacokinetics of inhaled drugs is currently being developed and is

provisionally scheduled for late 2015. This meeting will aim to provide an update on current approaches in industry and academia, consider the strengths and weaknesses of technologies, identify the scientific developments required to enable successful pharmacokinetic modification and review product development challenges from a technical and regulatory perspective.

The APS Inhalation Focus Group

The APS Inhalation Focus Group (IFG), which hosts the Drugs in the Lungs Network, has a schedule of exciting meetings.

The APS PharmSci 2014 Conference, scheduled to be held in September 2014, was to include a session chaired by the IFG on “New Technologies and Novel Therapeutics.” The session was to include invited talks by leading researchers on: (i) measuring and understanding powder surface properties for improved control of API manufacturability and handling and (ii) the endogenous regulation of nitric oxide bioavailability.

In addition, a series of one-day focus meetings on the following topics are soon to be announced:

- Bioequivalence of Orally Inhaled Products, 2015
- Modulating Pharmacokinetics of Inhaled Drugs, 2015
- Delivering High Doses to the Lungs, 2016

The IFG is also launching an initiative to provide introductory training in inhalation science. A biennial “APS Inhaled Product Development Workshop: The Science and Strategy to Develop an Aerosolized Medicine” is to be launched in 2015 with the aim of providing an introduction to the science, technology, regulation and development of inhaled drug products. Its target audiences include early career stage academics in pharmaceutical and allied sciences, industrialists working in pharmaceutical or small and medium enterprises, and those

who wish to gain fundamental knowledge in these areas to help build future capabilities.

To get involved

The presentations from all “Drugs in the Lungs” events are freely available on the DITL website: www.apsgb.org/drugsinthelungs. Any suggestions for future symposia or initiatives for open innovation in the area of inhalation biopharmaceutics are welcome. Please contact Ben Forbes for further information.

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