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Abstract

SWOT analysis of Inhalers in Consideration of Sustainability and Lifecycle management

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Abstract:

Inhaled drug delivery has a long history in medicine and has revolutionised the treatment of respiratory diseases as well as presenting exciting opportunities for delivery of novel drug modalities, the anatomical features of the lung and surrounding circulation facilitating both local and systemic treatment. Inhaled drug products comprise the formulation and delivery system, for example, metered dose inhaler (MDI), dry powder inhaler (DPI) and nebulisers, with device selection being determined by patient need. The environmental impact of inhalers is an increasingly pertinent area for consideration. The global warming effect of propellants used in MDIs that led originally to the phase out of ozone-depleting chlorofluorocarbon propellants has again resurfaced due to the (albeit smaller) greenhouse effect of hydrofluoroalkane alternatives, leading to new research into "cleaner" replacements, for example, HFA152a (Noakes & Corr, 2016). . In addition, the Blue Planet effect is leading manufacturers to explore opportunities to improve sustainability of the plastics used in inhaler devices. Within this process, there are a number of factors that must be considered, to ensure seamless transition during product lifecycle evolution and minimise patient impact. This presentation intends to review the current situation, identify the opportunities and discuss some of the challenges that must be overcome in the lifecycle evolution of inhaled products in anticipation of future patient and environmental needs.

Noakes T & Corr S (2016) The Future of Propellants for pMDIs. Drug Delivery to the Lungs 27, 61-64

Biography:

A qualified pharmacist, after completing her PhD from University of Cardiff in 1997 on the re-formulation of MDIs in novel hydrofluoroalkanes, Michelle started her industrial career developing dry powder inhalers at Novartis Horsham Research Centre (UK). She moved to GlaxoSmithKline R&D in 1999 where she led the formulation development of a number of dry powder inhaler products, from Phase 2b to launch and post launch commitments. She has significant experience in both formulation and process development to QbD principles, technology transfer and regulatory interaction, and applied her technical acumen and experience in leading scientific understanding initiatives within the department. Michelle recently led regulatory lifecycle activities for marketed respiratory assets before joining Pharmaron-UK as Director of Late Stage Formulation.

Publication of speakers:

1. Xuan, Botai & Ghosh, Deepraj & Cheney, Emily & Clifton, Elizabeth & Dawson, Michelle. (2018). Dysregulation in Actin Cytoskeletal Organization Drives Increased Stiffness and Migratory Persistence in Polyploidal Giant Cancer Cells. Scientific Reports. 8. 10.1038/s41598-018-29817-5.
2. Quach, Nhat & Kaur, Sukhneeraj & Eggert, Matthew & Ingram, Lishann & Ghosh, Deepraj & Sheth, Sheela & Nagy, Tamas & Dawson, Michelle & Arnold, Robert & Cummings, Brian. (2019). Paradoxical Role of Glypican-1 in Prostate Cancer Cell and Tumor Growth. Scientific Reports. 9. 10.1038/s41598-019-47874-2.
3. Ghosh, Deepraj & Mejia Pena, Carolina & Quach, Nhat & Xuan, Botai & Lee, Amy & Dawson, Michelle. (2020). Senescent mesenchymal stem cells remodel extracellular matrix driving breast cancer cells to more invasive phenotype. Journal of Cell Science. 133. jcs.232470. 10.1242/jcs.232470.

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