New understanding of asthma medicines could improve future treatment

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This is the first time that the 3-D microstructure has been revealed and gives scientists and pharmaceutical producers a better understanding of the behaviour of the drug product under aerosolisation.

Lead author of the research, Dr. Parmesh Gajjar said: "We have been able to visualise a drug-blend in 3-D, and see the interplay between drug and non-drug particles in the medicine. This is important for final quality control of asthma medicines to check the actual amount of drug and to help formulate improved asthma medications."

Due to the new technological innovation the findings was initially announced at the Respiratory Drug Delivery (RDD) 2020 conference. The group's work was selected to be a key presentation at the global conference, originally scheduled to take place in Palm Springs but now occurring in a digital format as a result of the global COVID19 pandemic.

The work was made possible through the high-resolution X-ray computed tomography (XCT) instruments in the world leading Henry Moseley X-ray Imaging Facility (HMXIF) at The University of Manchester that provide the capability to analyze a sample at up to 50 nanometers in resolution.

This is particularly important for the inhalation medicines which require aerosolization to generate particles small enough to be adsorb via the lungs. In this project the particles measured less than 5 µm to reach the deepest parts of the lungs.

The paper; 3-D characterization of dry powder inhaler formulations: Developing X-ray micro computed tomography approaches, is published in the European Journal of Pharmaceutics and Biopharmaceutics.

More information: P. Gajjar et al. 3D characterisation of dry powder inhaler formulations: Developing X-ray micro computed tomography

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