

Nano-particle research will benefit inhaler-users

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Patients suffering from conditions as diverse as asthma and diabetes could benefit from research at Cardiff University to improve the effectiveness of drugs taken through spray inhalers.

Scientists in the Welsh School of Pharmacy are working on new nano-particle drug formulations for inhalers, and enhancers to improve the effectiveness of proteins, such as insulin, delivered to the lung.

"Drugs delivered through inhalers are usually either in a suspension (as particles dispersed in liquid), or in a solution (when the drug is dissolved in the liquid)," explained Dr James Birchall. "However, there are problems with both methods - a suspension can lead to sediment in the inhaler and less of the drug reaching the target area of the lung, while solutions present problems in dissolving the drug in the inhaler propellant liquid and can make the drug itself less stable."

The Cardiff team's approach is to prepare the drug in nano-particle form – ensuring the correct dosage reaches the lung and the drug retains its stability, and providing the possibility of slowing the release of the drug in the lung for longer therapeutic effect.

This could lead to the possibility of more drugs being administered effectively by inhaler, rather than by tablet or injection.

Meanwhile, the team is also developing a process which uses a naturally occurring substance to enhance the absorption of insulin. Initial studies suggest insulin is absorbed three to four times more effectively by this

process.

Now Dr Birchall and his colleague Dr Glyn Taylor of The Pulmonary Research Group aim to combine the two innovations to prolong and maximise the absorption effect.

"These two technologies could make a huge improvement in the effectiveness of spray inhalers for users suffering from a wide range of illnesses and conditions," said Dr Birchall.

Source: Cardiff University

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