

Chemical Technology

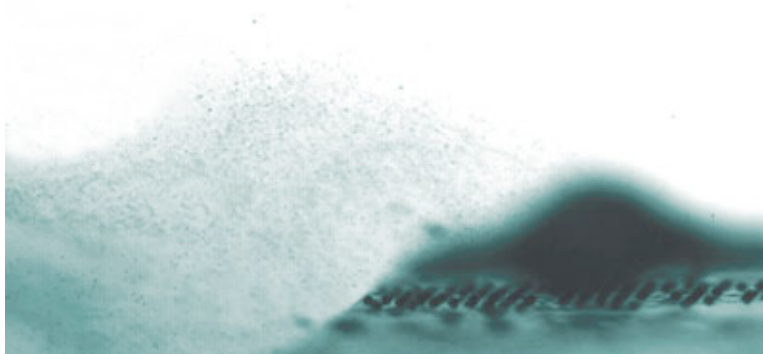
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Drug delivery's a blast

15 May 2009

A portable, miniature system for delivering steroids into the lungs of asthma patients has been developed by scientists in Australia. The system is cheaper and more efficient than conventional nebulisers and could be used to administer vaccines, antibiotics and other drugs, they say.



The surface acoustic wave generates a fine mist from the droplet containing the drug salbutamol

The battery-powered device, developed by Leslie Yeo and colleagues at Monash University, Clayton, generates a surface acoustic wave (SAW), a 10-nanometre earthquake-like wave, which travels across the device's surface. When Yeo placed a liquid droplet containing salbutamol, an anti-asthmatic drug, on the surface, the wave blasted the droplet into a fine mist suitable for inhalation into the lungs.

Conventional inhalers rely on a patient's ability to breathe in a drug-containing aerosol. With the new device, Yeo can alter the drug aerosol's production rate to account for variability in patients' breathing patterns and so deliver the maximum lung dose to the individual. This could be useful for infants, young children or people who have severe cases of asthma, he says.

The device can easily fit in the palm of your hand and is reusable, explains Yeo - an insertable cartridge would provide the drug and be replaced when empty. It delivers a lung dose (percentage of drug delivered to the lower lung region) of 70 to 80 per cent, much higher than the 30 to 40 per cent doses obtained with conventional inhalers. This means less of the drug is wasted, states Yeo.

'This is a most promising aerosol generation technology that can soon be translated into commercialised devices for pulmonary drug delivery,' comments Hsueh-Chia Chang, an expert in microfluidics and medical diagnostics, at the University of Notre Dame, US.

'The delivery of asthmatic steroids is just the tip of the iceberg,' predicts Yeo. 'We hope to be able to deliver vaccines, antibiotics and other drugs in the future.'

Michael Brown

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Miniature inhalation therapy platform using surface acoustic wave microfluidic atomization

"This is a most promising aerosol generation technology that can soon be translated into commercialised devices for pulmonary drug delivery"
- Hsueh-Chia Chang, University of Notre Dame, US

Aisha Qi, James R. Friend, Leslie Y. Yeo, David A. V. Morton, Michelle P. McIntosh and Leone

Spiccia, *Lab Chip*, 2009

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