Drug tracked in tissue

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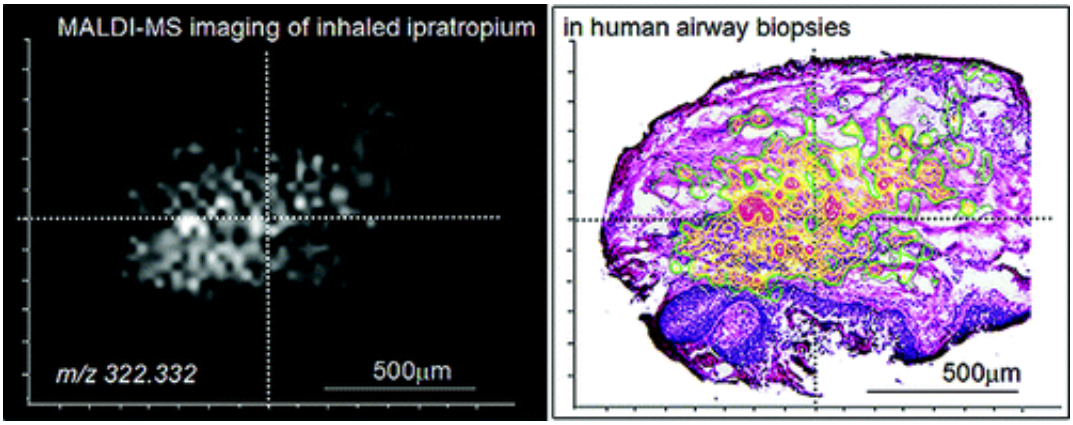

When a new drug is developed, the manufacturer must be able to show that it reaches its intended goal in the body's tissue, and only that goal. Such studies could be made easier with a new method now established at Lund University in Sweden.

The method is a special type of mass spectrometry which can be used on drugs 'off the shelf', i.e. without any radioactive labelling which may change the behaviour of the drug. With this method, researchers György Marko-Varga and Thomas Fehniger have managed to create a molecular image of the drug in the tissue.

The tissue examined comes from biopsies from the lungs of patients with lung cancer and chronic obstructive lung disease (COPD), who have

inhaled a drug to dilate the airways. The examination showed the precise spatial distribution of the drug within the tissue. The results are based on an analysis of 3 000 measurement points of 0.01 mm2 in each biopsy sample.

"When you want to register a new drug, you must be able to both explain its exact mechanisms of action and show that it is effective and safe. In order to avoid side-effects, the drug should reach only the cells for which it is intended. Our new technical platform makes it easier to show this", says György Marko-Varga.

He believes it will be possible to use the new technology to develop safer and more effective drug candidates. In the future it could also be used in clinical treatment, to help doctors select the right drug for a specific patient.

The researchers first conducted animal experiments, using drug doses 100 times higher than those now measured in patients. The group then optimised and refined the technology to achieve the sensitivity needed for measuring doses of drugs normally administered to patients.

Professors György Marko-Varga and Thomas Fehniger are both members of the Department of Measurement Technology and Industrial Electrical Engineering in Lund. Thomas Fehniger (who is the principal author of the article) is currently working at The Tallinn University of Technology, sponsored by the Estonian Science Foundation under the European Social Fund, while György Marko-Varga works part time for the University of Tokyo.

The two researchers have previously worked at the pharmaceuticals company AstraZeneca, which has also contributed to the study. The study was recently published in the journal *Analytical Chemistry*.

More information: A text about the research findings is available at pubs.acs.org/cen/news/89/i41/8941scene.html and the research article is available at pubs.acs.org/doi/abs/10.1021/ac2014349

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