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News

Targeting fake drugs

Chemists develop method for spotting counterfeit pharmaceuticals.

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Pharmaceutical fraudsters have had an easy ride for years — counterfeit drugs are notoriously difficult to detect through all the layers of packaging. But a new tweak to an old stalwart of analytical chemistry could change all that.

The new method can penetrate packaging to 'see' what drug is inside.

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Fake drugs are a major international concern (see 'Murder by medicine'), though estimates vary widely as to how bad the problem is. The US Food and Drug Administration suggests that 10% of all drugs are fake; other, unofficial estimates range up to 50%. The problem is worst in developing countries. But Internet sales are helping to push up the figures in the developed world too.

Now, chemists have enlisted a technique called Raman spectroscopy in the fight against fake drugs. By shooting a laser at the target, the technique probes molecular vibrations that are unique to certain chemical bonds — allowing researchers to identify specific molecules through their unique 'Raman' spectrum[1].

> **"You could scan huge samples at once."**

The trouble is, the technique usually only works in a very small area, and on the surface. That's a problem when it comes to spotting fake drugs that are encased in capsules, blister packs, or bottles. Drug-testers need to be able to analyze a suspect drug quickly and without having to open the packet.

Pavel Matousek and colleagues at the Rutherford Appleton Laboratory in Didcot, UK, have tested their method on a range of over-the-counter drugs to show how to get around this packaging problem. They used a version known as spatially offset Raman spectroscopy (SORS), in which the detector is slightly offset from the point where the laser hits the sample. That allows the detector to detect photons that have spent time travelling through the actual drug, rather than ones simply bounced off the packaging.

Matousek and colleague Charlotte Eliasson tested their stash of drugs, such as ibuprofen and paracetamol, without removing them from their blister packs or bottles. They then compared the resulting spectra with reference spectra for the drugs, and with conventional Raman spectra. Unlike conventional Raman, SORS could identify the drugs. Previously, says Eliasson, "it hadn't been possible to detect a Raman signal from deep inside the sample."

Darren Andrews from CLIK Knowledge Transfer Daresbury Laboratory in Didcot is setting up a company to develop SORS for commercial use in the new and growing anti-counterfeit industry. Adapting an existing handheld Raman spectrometer into a portable SORS detector should be relatively simple, he says — allowing it to be used in the field.

Andrews also envisions other uses for drug companies, such as monitoring drugs as they go through the manufacturing process. "You could scan huge samples at once," he says.

Caroline Rodger, associate principal scientist at the drugmaker AstraZeneca in Macclesfield, UK, agrees. The technique could save the industry substantial amounts of money, she says, both from counterfeit drugs and in drug production.

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References

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