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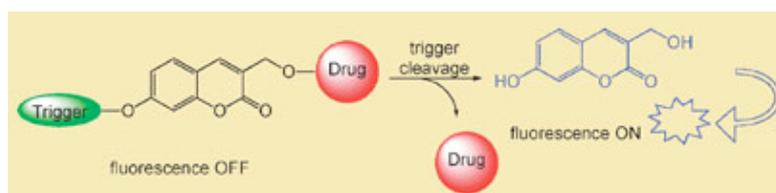
Monitoring drug release as it happens

11 January 2010

A drug-delivery system that could track the fate of drugs has been developed by scientists in Israel.

Drug-delivery systems deliver medications to specific parts of the body and control the rates that they are released. They overcome common problems associated with traditional drug treatments such as that of poor solubility or undesired side-effects.

Understanding just how the drug is released from the delivery vehicle is crucial for achieving good results. 'However, to date, this process could only be studied indirectly inside living organisms,' says Doron Shabat of Tel-Aviv University, Israel. 'Since the behaviour of drug-delivery systems can vary extensively, depending on their surroundings, it is highly important to study them in their actual functional environment,' he adds.



Fluorescence is turned on as soon as the drug leaves the delivery vehicle

Shabat and colleagues have designed a reporting drug-delivery system which allows real-time visualization of the drug-release process in a non-invasive manner and have demonstrated its use *in vitro*. 'As a result, the process of drug-release could be imaged, for the first time, in real-time, inside living organisms,' says Shabat.

Shabat's system produces a fluorescent signal that depicts the status of the drug molecule. While the drug molecule is connected to the delivery vehicle, the fluorescent signal is off. On its release the fluorescent signal is turned on and can be immediately detected and imaged.

Rui Moreira, an expert in drug-delivery systems (prodrugs) at the University of Lisbon, Portugal welcomes the work. 'Real-time monitoring of prodrug activation allows a much closer insight to the kinetics in whole-cell systems. Gathering activity and activation data in a single set of experiments will speed-up the design of more effective prodrugs,' he says.

Shabat says the next task will be use linkers that fluoresce at longer wavelengths to monitor drug release *in vivo*.

Sarah Corcoran

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Real-time monitoring of drug release

Roy Weinstein, EHUD Segal, Ronit Satchi-Fainaro and Doron Shabat, *Chem. Commun.*, 2010, **46**, 553

DOI: 10.1039/b919329d

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