

On-the-spot DNA analysis to test tolerance to prescription drugs gets closer

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(PhysOrg.com) -- A handheld device to predict whether patients will respond adversely to medication is one step closer to the market, thanks to a new partnership announced today.

Imperial College London and its spinout company DNA Electronics have developed a prototype healthcare device that assesses whether patients are genetically predisposed to suffering adverse reactions to prescription drugs. They are now carrying out trials to test its effectiveness, thanks to a new partnership with the pharmaceutical company Pfizer.

Each year, the NHS spends £460 million to treat 250,000 patients who

are admitted to hospital suffering adverse reactions to prescribed medication. These reactions can vary in severity, from dizziness and nausea to heart palpitations or unconsciousness.

A test to identify people likely to react badly to prescribed medication such as anti depressants or drugs to lower cholesterol could enable doctors to tailor dosages and drugs to the individual needs of each patient.

The device undergoing trials is the Single Nucleotide Polymorphism Doctor, or SNP Dr (pronounced 'snip doctor'). It is a portable technology that gives fast accurate spot test results for specific DNA sequences that indicate how we are likely to respond to certain drugs.

The SNP Dr works by analysing genetic variations found in DNA called Single Nucleotide Polymorphisms (SNPs). SNPs are the parts of human DNA that make us all respond differently to disease, bacteria, viruses, toxins or medication.

In particular, researchers are exploring how the SNP Dr might detect genetic sequences linked with metabolism. A slow metabolism can make drugs stay in the body longer, causing adverse side effects, while a fast metabolism can process medication too quickly for it to have any effect.

The SNP Dr works by analysing the DNA in saliva or cheek swab samples, which are placed in a cartridge and exposed to the silicon chip sensors inside the device. A copy of the fast or slow metabolic SNPs is contained in the chip. If they detect a match, a message is displayed on the SNP Dr's console. The doctor can then assess their patient in the GP surgery, without a lengthy and costly laboratory analysis, and prescribe dosages and treatments accordingly. Professor Chris Toumazou FRS, principal investigator at Imperial, says:

“Nothing can replace the expert advice your GP gives you. However, the SNP Dr could provide another layer in the treatment process that could help GPs to personalise treatments according to the genetic requirements of each patient.”

Dr Leila Shepherd, Chief Technology Officer of DNA Electronics adds that the introduction of the SNP Dr into the GP surgery could also pave the way for new types of drugs to reach patients in the future. She says:

“At the moment, some cancer fighting drugs are deemed uneconomical because they only work for a certain subset of patients. If doctors had a method of screening patients to see whether these drugs work, then suddenly these therapies would be more cost effective to use.”

The £1.2 million project is part-funded by the Government’s Technology and Strategy Board. The partnership will see Imperial and DNA Electronics providing the scientific and product development team with Pfizer providing clinical samples, access to its distribution network in the pharmaceutical sector and feedback as a potential end user of the product.

Provided by Imperial College London

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