

Biological invisible ink used for blood tests

New technology being developed at AUT University will provide a simplified method for blood testing.

Called biosurfacing technology, the new development uses a standard desktop inkjet printer to print diagnostic markers (invisible ink) as words onto paper. If the result is positive, the assay returns the result as words – a kind of invisible biological ink.

The new technology would be a significant change from the status quo, which requires sophisticated equipment and experienced operators.

Working on the technology is AUT biotechnology PhD student Katie Barr, who won the student scientific poster competition at the NZBio conference in Auckland earlier this year for her poster promoting biosurfacing technology - 'a novel solution for diagnostic printing'.

Barr, originally from England, says it was awesome to be recognised. "It's great to know that people in the industry find it interesting."

The technology uses inkjet printers to print specialised molecules called FSLs (function-spacer-lipids) on paper. FSLs are molecules made of three components - a functional

part, spacer and lipid.

This special construct is the core of the new technology as it can be constructed with a variety of different diagnostic functional heads; is compatible with printer technology, and remains attached to surfaces including paper.

In the assay a blood sample is dropped onto paper and if there is an antibody in the blood (directed against the functional part of the printed FSL), it attaches to the printed FSLs. Following development, words will appear and the operator simply reads the result by eye.

The whole procedure can be done without any machines and at room temperature, making it ideal for diagnostics in the field and especially in the developing regions. Initially the technology is being developed to determine blood type, but ultimately the objective is to use it for a wide range of diagnostic testing. That includes tests for a range of infectious diseases like HIV,



AUT biotechnology PhD student Katie Barr

syphilis and hepatitis.

"Currently most assay testing requires expensive equipment, but this assay can be done with equipment as simple as a drinking cup and an eye dropper. Like a pregnancy test, the answer is given back as a visual result, in this case, words."

Pro Vice-Chancellor's Perspective

We mostly hear bad news on the health front. In contrast - in the real world - many good things are happening. Across the country, emergency department and cancer treatment waiting times have reduced markedly; access to elective surgery has increased and diabetes and cardiovascular services improved.

There have been impressive gains in two public health targets - increased immunisation and better help for smokers to quit. These achievements should be celebrated. However, achieving further gains in service quality and access is becoming more challenging with an ageing population, financial pressures and workforce shortages. Progress requires innovation - new ways of thinking and working that achieve more for less. In part this is happening through greater cooperation between district health boards, reducing duplication and 'back office' costs. Another focus is on new models of care including the expansion of community-based services and increased collaboration between primary and secondary (hospital) care. Universities have a critical role to play. This includes advancing knowledge that underpins professional practice and policy and growing and up-skilling the workforce to meet future demands. Gaining rapid access to diagnostic testing in primary care settings is central to providing more convenient, effective and rapid care. The accompanying story features innovative

University research that has the potential to greatly simplify and speed up diagnostic testing.

Last week I spoke at the opening of Ko Awatea. This new initiative, based at Middlemore



Prof. Max Abbott
Pro Vice-Chancellor
AUT North Shore

..... Hospital, is a cooperative venture involving Counties Manukau DHB, AUT University, the University of Auckland and Manukau Institute of Technology. Its main objects are to drive innovation in health systems, models of care, quality improvement, leadership, technology enablement, evaluation and workforce development. A somewhat similar innovation centre (Awhina) is being developed at North Shore Hospital and some other Waitemata DHB sites. Again this is in collaboration with AUT and other universities.

While there have long been strong ties between the University and the health sector, these developments signify an increased commitment to face common challenges together and seek innovative, effective ways to advance the public health of the communities we collectively serve.

AUT NORTH SHORE CAMPUS

90 Akoranga Drive,
Northcote
Auckland

0800 AUT UNI (0800 288 864)
courseinfo@aut.ac.nz
www.aut.ac.nz

