



PathWay

THE ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALASIA



MARCH 2016 | Published by RCPA

Issue #056

In This Issue

- A 'Plasma DNA tissue mapping' blood test to pinpoint cancer locations is on the horizon
- Diagnosing rare cancers set to become easier with 21st century 'microscopes'
- Microbiologists in pole position to influence antibiotic use
- World-leading study will look at ways to improve medical test reporting

Welcome to the March edition of ePathWay

Pathology Update 2016 is over for another year, and with over 1200 attendees attending eight concurrent sessions over three days, it was another success story for the college. But we're not finished with it yet. Our articles for the next few months will be inspired by the information shared at this scientific meeting of minds.

This edition covers:

- A snapshot of plasma DNA tissue mapping to pinpoint cancer locations through a blood test.
- Antimicrobial stewardship and why microbiologists are well placed to influence antibiotic use.
- Diagnosing rare cancers using 21st Century 'microscopes'.
- A five-year study to establish how technology can be used to reduce cases of incorrect and missed test results in hospitals, and standardise the quality of reporting.

You can check out posts and images from Pathology Update 2016 on our [Facebook](#) page as well.

Save the date: Pathology Update 2017 will be from Friday 24 February to Sunday 26 February in Sydney's brand new International Convention Centre.

Interesting Facts

1233

The number of attendees at Pathology Update 2016.

16

The number of countries which attendees travelled from including Belgium, Germany and Saudi Arabia.

A 'Plasma DNA tissue mapping' blood test to pinpoint cancer locations is on the horizon

146

The number of speakers at the conference.

Source: RCPA

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Bottom Left: Professor Rossa Chiu

Using blood plasma samples to detect cancer and pinpoint its anatomical location could be just a few years away from regular medical practice. Dubbed plasma DNA tissue mapping, the approach will allow doctors to 'visualise' which organs are affected by cancer, and at what stage, through a blood test.

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Diagnosing rare cancers set to become easier with 21st century 'microscopes'

One third of Australians who die of cancer each year are estimated to have a 'rare cancer', making better diagnostic and treatment options for these diseases an important priority. Gene sequencing technology has the potential to deliver these outcomes, and revolutionise the diagnosis of all cancers in the process.



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Microbiologists in pole position to influence antibiotic use

Two speakers at the recent Pathology Update 2016 conference may have hailed from opposite sides of the globe, but they delivered the same message: antimicrobial medicines (antibiotics) are a precious resource that must be protected and used judiciously. This is because their diminishing effectiveness through widespread and long-term inappropriate use is now seriously menacing our global village, and we may have no more magic bullets up our sleeve when these drugs no longer work.



[read more »](#) *Dr Stephanie Dancer*

World-leading study will look at ways to improve medical test reporting

We may have many ways of tailoring the delivery of pathology test results, but the system isn't flawless. Research shows that test results in hospitals are being missed in 20% of cases, including 62% of cases in one study and in up to 75% of patients treated in an emergency department. A new world-leading study will look at how technology can be a part of the solution, particularly in busy hospital settings.



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RCPA Message



Pathology gives life's most important answers.



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- The times are a-changin' for cytopathology
- Zika virus outbreaks warrant extra precautions for pregnant women
- It takes more than love to set hearts on fire
- Cryptosporidiosis spike could keep the sizzle in summer

Welcome to the February edition of ePathWay

Pathology Update kicks off this Friday (February 26) for three days of formal and informal information sharing. Social media will play a major role in this year's event and we will be ensuring that the important messages of pathology are heard, but we need your help too. Please like our Facebook page (if you haven't already) and follow us on Twitter, then share your thoughts and experiences from the event. Highlighting the important role of pathology has never been more vital so don't forget to use the hashtags #PathUpdate #Pathology #RCPA to keep the conversation going.

The Pathology Update 2016 Mobile App can be downloaded at

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Using blood plasma samples to detect cancer and pinpoint its anatomical location could be just a few years away from regular medical practice. Dubbed plasma DNA tissue mapping, the approach will allow doctors to 'visualise' which organs are affected by cancer, and at what stage, through a blood test.

Choh Ming-li Professor of Chemical Pathology and Assistant Dean (Research) at the Faculty of Medicine at The Chinese University of Hong Kong, Professor Rossa Chiu, says the latest developments in human plasma cancer DNA analysis are pushing new boundaries.

"We have developed a brand new technology which takes cancer DNA analysis in plasma, often referred to as 'liquid biopsies', to the next level. It can detect abnormal DNA caused by cancer, and also allow us to scan a blood sample in order to locate which organ it is coming from. In simple terms, it enables us to take a CT scan of the blood," she explains.

"For instance, we might be able to identify that 10% of the DNA in the blood plasma is from the liver and so we know that person has a tumour located in the liver. In the past we have tried to find a marker for liver cancer, but every cancer is very different and no single marker is particularly useful for a specific type of cancer. That means previously we would have detected cancer in a blood sample, then we would do a radiological imaging examination to see if there are shadows in any parts of the body."

She says the latest technology has improved the blood based test so much that researchers can now look at the profiles in the blood sample and then map out which tissues are making regular and abnormal contributions. This process takes about one week.

"The technique needs further improvements and large scale, blinded clinical trials before it can be used in clinical practice, but

I am quite confident liquid biopsies will play a role in diagnosing cancer.”

Professor Rossa Chiu is a Fellow of the RCPA. She presented *Hunting for the signatures of cancer by plasma DNA sequencing* on Friday 26 February at Pathology Update 2016 at the Melbourne Convention Centre.

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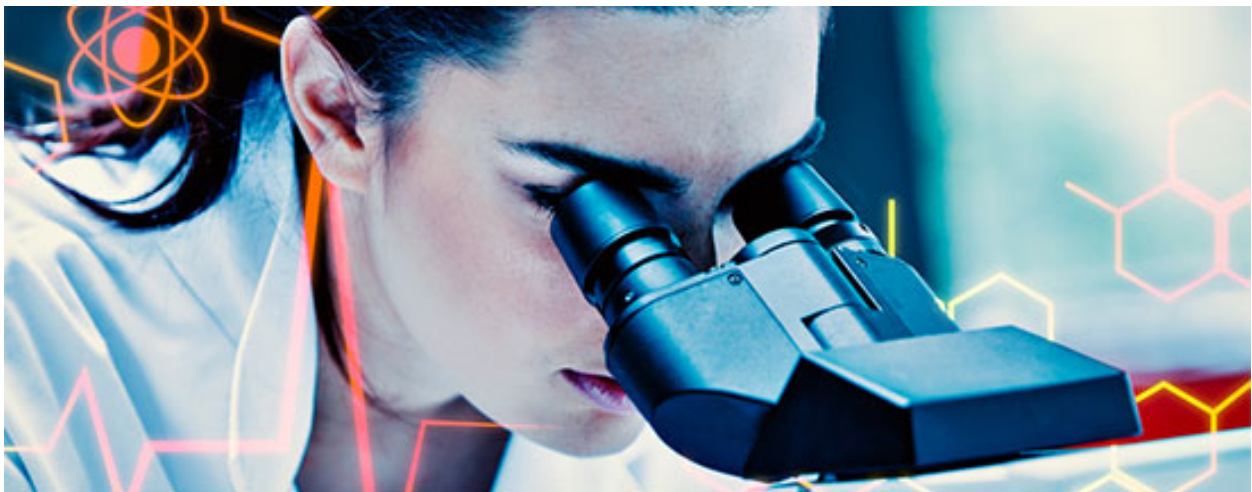
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One third of Australians who die of cancer each year are estimated to have a 'rare cancer', making better diagnostic and treatment options for these diseases an important priority. Gene sequencing technology has the potential to deliver these outcomes, and revolutionise the diagnosis of all cancers in the process.

Professor Sandra O'Toole, Head of Molecular Diagnostic Oncology at the Royal Prince Alfred Hospital in Sydney, says next generation sequencing is set to become commonplace in medical practice and deliver untold benefits to patients.

"The impact of massively parallel gene sequencing will be similar to the invention of the microscope 400 years ago which completely transformed our understanding of how our cells worked. This new technology allows us to detect changes in thousands of genes in cancer cells in a single test."

Prof O'Toole says the cost of this technology is becoming so low that it is increasingly being implemented in medical practice across Australia.

"It will become an essential tool to diagnose cancers and offers enormous potential to understand why certain cancers look and behave the way they do. This will be particularly useful when diagnosing and treating patients with rare types of cancers."

While this approach looks good on paper, experts are needed at the coalface to make this capability a reality. That is why the RCPA will commence courses in Sydney later this year for pathologists on molecular and genomic pathology.

"This is a fantastic opportunity for those already in the pathology profession, particularly tissue pathologists. The aim is to enable them to apply their highly honed diagnostic skills to the latest technology in order to make medical breakthroughs."

Professor Sandra O'Toole attended Pathology Update 2016 and served as Chair of the Innovations Plenary.

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Microbiologists in pole position to influence antibiotic use



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Dr Stephanie Dancer, Consultant Microbiologist from NHS Lanarkshire and Professor of Microbiology at Edinburgh Napier University, Scotland, spoke first, and she left little doubt about the seriousness of the situation.

“One particular problem is the overgrowth of resistant organisms following antibiotic therapy. These so-called super-infections are often more difficult to treat because they are resistant, and they will also spread to other patients if given the opportunity,” she explained.

“Another problem is that the original pathogen may survive antibiotic treatment so that an acute infection turns into a chronic one. It is even possible that exposure to antibiotics actually encourages the original pathogen to become more virulent.”

Dr Dancer said the global community needs the courage to wind down antibiotic use, and the medical community needs to say ‘no’ to patient requests for antibiotics unless they are sure it is the right treatment for the right infection.

“Giving a patient the ‘wrong’ antibiotic doesn’t just fail to cure that patient. It results in a persistent infection with a more resistant pathogen, which then spreads to others and ultimately threatens the future management of infections,” she warned.

Associate Professor Kirsty Buising, Infectious Diseases Physician at the Victorian Infectious Diseases Service at the Royal Melbourne Hospital and Deputy Director of the National Centre for Antimicrobial Stewardship, said we need a changed mindset



and [antimicrobial stewardship](#) (AMS) to tackle this issue. She also noted that microbiologists are in a prime position to help effect change.

“Microbiologists can have a huge role in advocacy for AMS because they are often the only experts that other medical staff talk to about antibiotics. They can offer advice and guidance about antimicrobial therapy, and use cascade reporting where they release reports outlining suitable narrow spectrum antibiotics for infections rather than offering results of unnecessarily broad spectrum antibiotics upfront, as these should be reserved as last line choices.”



A/Prof Kirsty Buising

A/Prof Buising said the most common reason antibiotics are prescribed in hospitals in Australia is to prevent post-operative infections. In other words, they are given to people who don't have an existing infection, but to prevent a possible infection instead.

“We also know from a recent pilot survey that more than thirty percent of antibiotics prescribed to residents in aged care facilities in Australia are for courses that last more than six months.”

The bottom line from both speakers is that the current situation can't continue. But there is hope. Dr Dancer said changes in antibiotic prescribing methods do make a difference in hospitals - a sentiment A/Prof Buising shared.

“Even small changes can have a big impact, and microbiologists can play a significant role as part of the solution.”

Dr Stephanie Dancer presented *How can antibiotics make us sick and what can we do about it?* on Saturday 27 February at Pathology Update 2016 at the Melbourne Convention Centre.

Associate Professor Kirsty Buising presented *AMS – how it works* at the same session.

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Associate Professor Andrew Georgiou, spokesperson for the RCPA and the Australian Institute of Health Innovation (AIHI), says the five-year study will establish how technology can be utilised to reduce cases of incorrect and missed test results in hospitals, and standardise the quality of reporting.

"Requesting pathology tests presents a potential critical safety issue in hospitals, and more specifically in emergency departments. With the regular change of physician shifts, differing communication levels and sheer volume of tests required, results can often be missed or a delay can occur in the diagnosis causing harm to patients."

A/Prof Georgiou says that technology is the key to limiting the occurrence of missed or incorrect diagnoses to ensure patients receive the most accurate care and treatment.

"To our knowledge this is the first time a study of this magnitude into the delivery of tests results has been conducted at this level anywhere in the world."

It's not all about doctors either. A/Prof Georgiou says the aim is to also involve patients in the process by looking at ways of communicating test results with them through avenues such as apps, websites, electronic reporting and patient portals.

"Most importantly, this is the beginning of an education process to enhance the reporting of results and ensure that patients understand their test results and records. We would like to explore how we can engage with patients in order to provide

patient centred care, and discover how we can involve patient voices in the care process. We're also formalising procedures and guidelines around escalating test results with medical practitioners.”

The study will be conducted by the AIHI in partnership with the Australian Commission on Safety and Quality in Health Care (the Commission), the RCPA and a major pathology service in Sydney.

Its kick off coincides with the release of the RCPA's new Pathology Information Terminology and Unit Standardisation Program (PITUS) [guidelines](#) that focus on safe reporting and the standardisation of practices for test results in hospitals. The guidelines also aim to advise hospitals on how issues surrounding test results can be isolated.

A/Prof Georgiou presented *How should we deal with missed test results and pending results at discharge?* on Saturday 27 February at Pathology Update 2016 at the Melbourne Convention Centre.

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