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Hints and tips on how to prepare for job interviews: *p.36*

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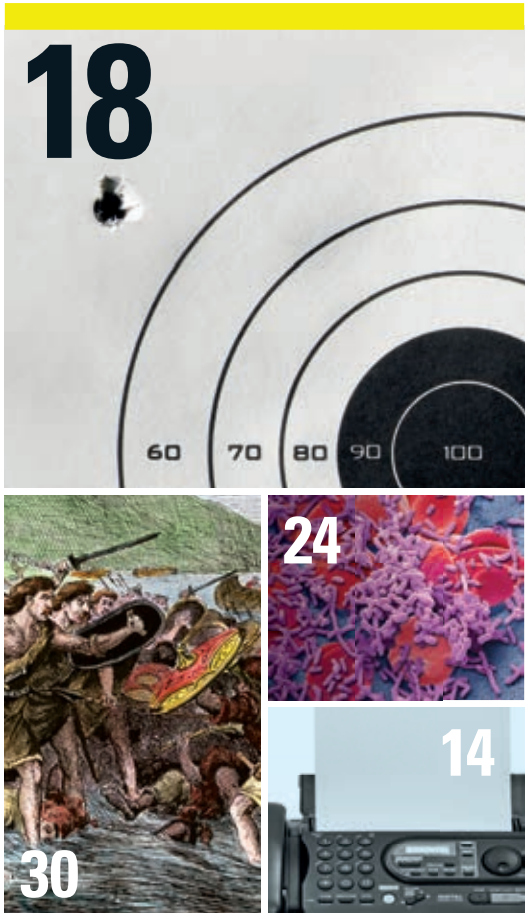

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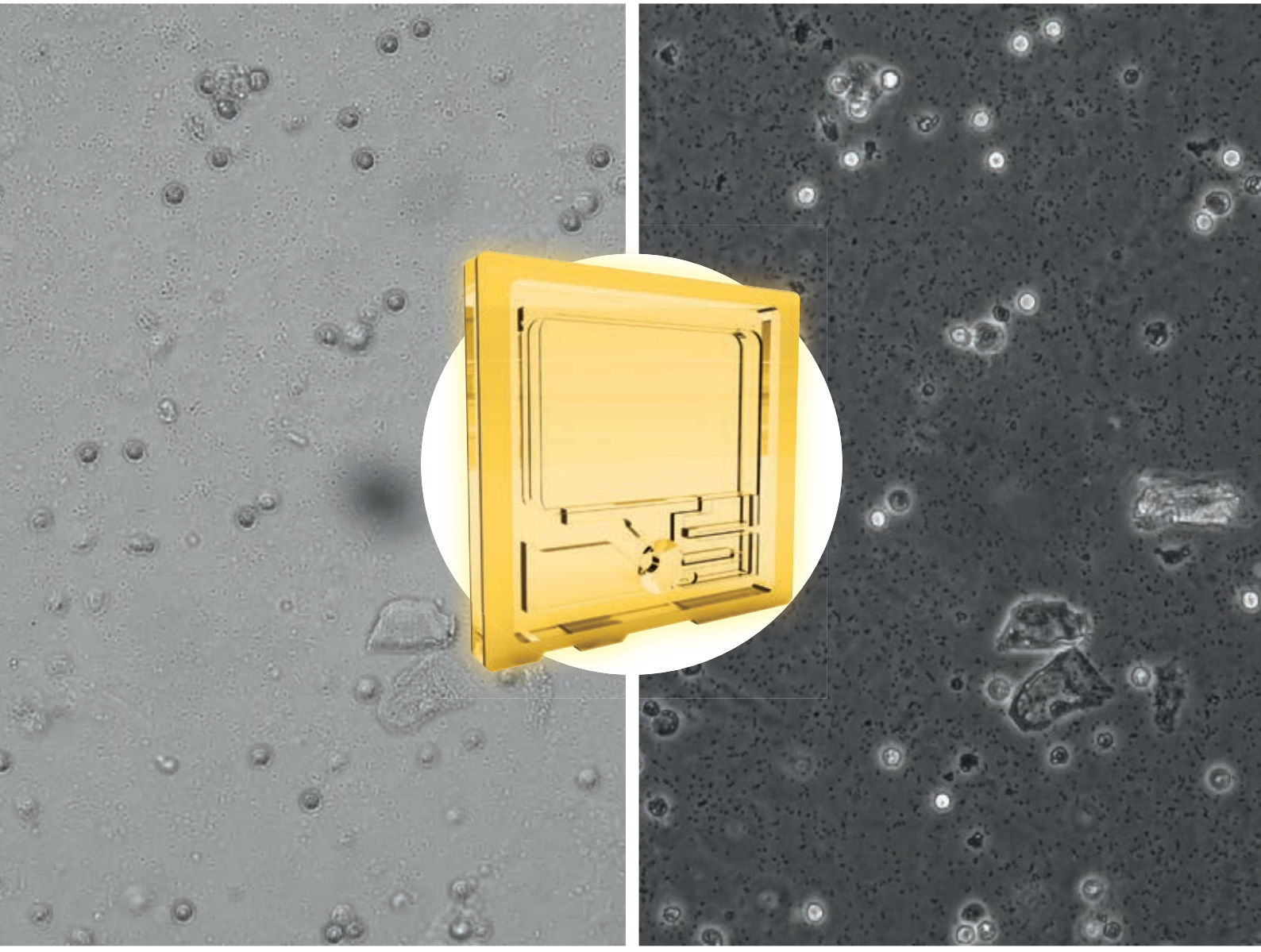

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CELEBRATE, LEARN, VOTE

Sarah May, IBMS Deputy Chief Executive, discusses three important issues that have one thing in common.

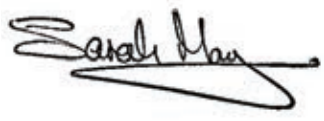
Ownership, self-determination and professional recognition are incredibly powerful drivers of how we are perceived and shaped. No, I'm not talking about Brexit, I'm talking about our profession and there are three extremely important events taking place that will each contribute to how our profession evolves and is perceived.

International Biomedical Laboratory Science day is on 15 April and the theme this year is the role of biomedical scientists in the detection and screening of non-communicable diseases. This is a perfect subject to showcase our central role in healthcare, but it also demonstrates the global biomedical science community that shares common goals, ambitions and frustrations. It is somewhat reassuring that our experiences and frustrations are shared with biomedical scientists across the world. Through the International Federation of Biomedical Laboratory Science (IFBLS), of which the Institute is a member, we will be celebrating the importance of our role in healthcare with thousands of other scientists across all of the continents. There are more issues that unite us than divide us.

The second event is Congress. The exhibition seminar programme is now complete and is on the Congress website and offers more than twenty presentations available free to delegates who are just attending as an exhibition visitor. The primary theme of these talks is education and training: we feel so strongly that everyone should have access to this information that we have taken the unprecedented step of putting these sessions on the free, open access exhibition hall seminar programme. We believe that learning should be without limits and that is what Congress seeks to deliver.

Finally, I want to talk about the forthcoming Institute Council elections, details of which are in this issue. Please take the time to read about the candidates, their personal statements and those of their supporters. These people are offering to commit their time and experience for the next three years to leading and shaping our profession. Those elected will give their time free and voluntarily and will be our voice; they will represent us, champion us and, if necessary, fight to ensure our profession has access to the opportunities that will allow us to make our contribution to improving the healthcare of our population. This election is carrying one of the largest number of candidates, each with very different qualities and experiences. Don't leave it to chance, please read, choose and vote for those you feel will serve us best.

Why have I chosen to write about these three very different issues? Because they have one thing in common: us. I believe the best people to promote our profession are confident biomedical scientists. We understand our role and are the best to carry our message. Celebrate International Biomedical Laboratory Science day, vote for your Council and come to Congress.



Sarah May
Deputy Chief Executive

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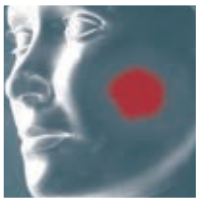
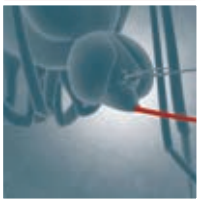
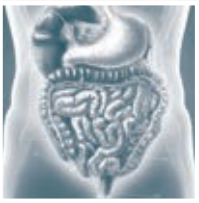
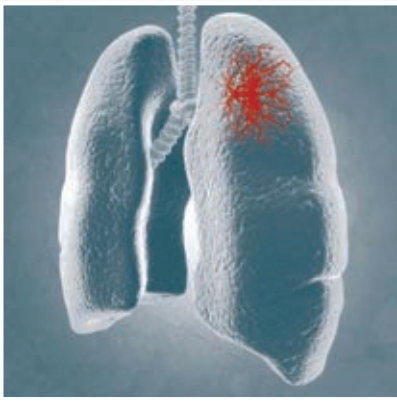

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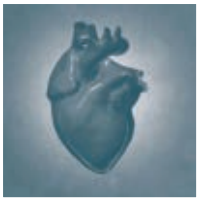
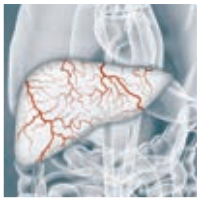
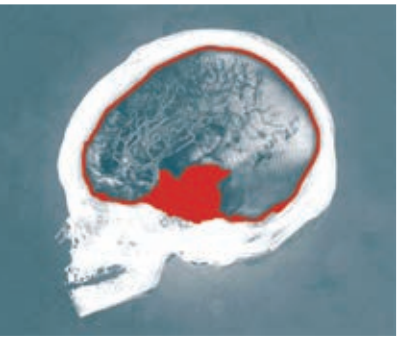



Multiplex PCRs



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SCIENCE NEWS IN NUMBERS

UK avoidable deaths

23%

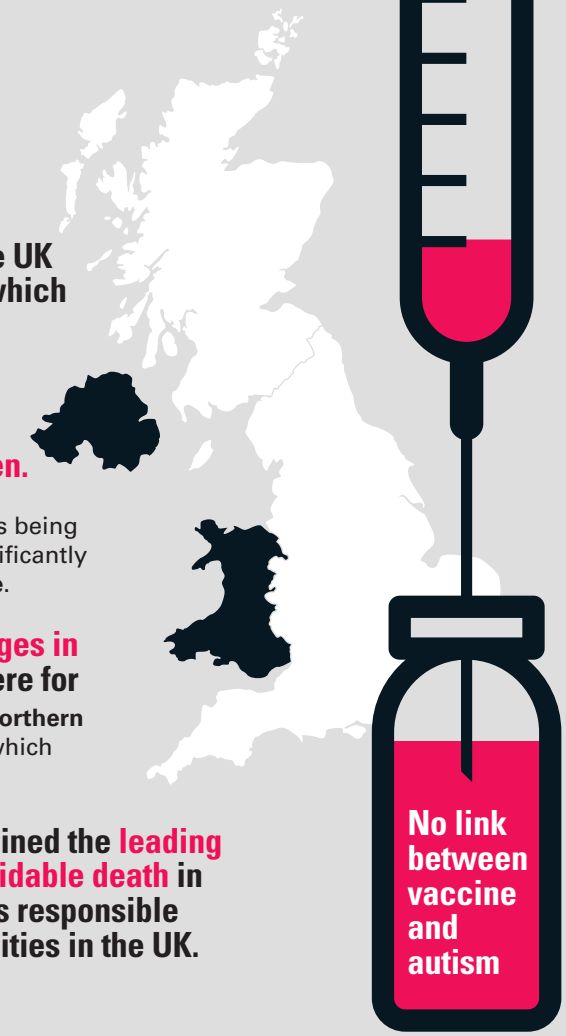
A total of 23% of all deaths (141,313 out of 607,172) in the UK in 2017 were avoidable, of which

60% were among men.

With **224.7 in every 100,000 deaths** being **preventable** in 2017, this was significantly less than the **228.7 the year before**.

Since 2014, the largest changes in avoidable mortality rates were for injuries, which rose by **37% in Northern Ireland,** and **respiratory disease**, which increased by **19% in Wales**.

92.7 **Cancer remained the leading cause of avoidable death in 2017 and was responsible for 92.7 in every 100,000 fatalities in the UK.**



10 YRS

A 10-year study of more than half a million people confirmed that the measles vaccine does not increase the risk of autism.
It is the largest study ever of the issue and **adds further to the evidence against** a link **between autism and the vaccine**.

Researchers looked at a Danish population registry of 657,461 children, some who were **vaccinated** with the **mumps, measles, and rubella (MMR) vaccine** and some who were not.

After over a decade of follow-up,

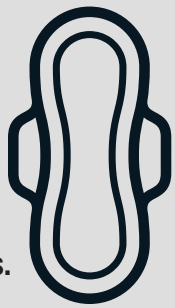
6,517

were diagnosed with autism. There was **no increased risk of autism in children who had the MMR vaccine and no evidence that it triggered autism** in susceptible children.

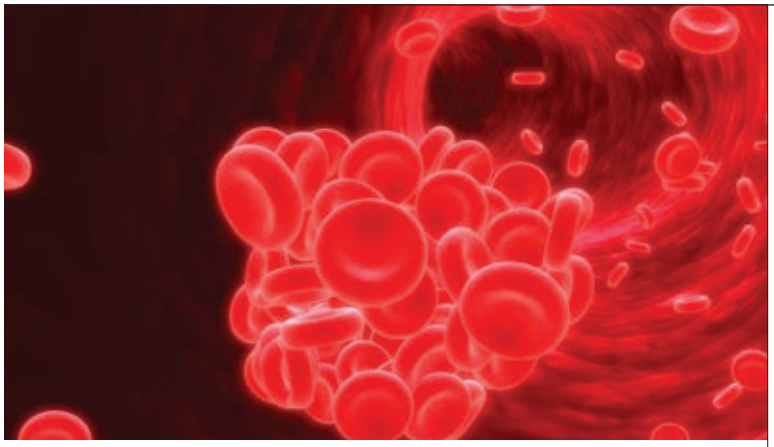
130,000

The NHS has been told to stop using pagers for communication by 2021.
The health service still uses about **130,000 pagers – 10% of the total still in use** globally. **They cost the NHS about £6.6m a year.** Health Secretary **Matt Hancock** said **"email and mobile phones"** are a "more secure, quicker and cheaper way to communicate".

Sanitary products
Two in five UK hospital trusts and health boards did not give sanitary products to patients who needed them, or did so only in emergencies.



NHS England said hospitals **providing free sanitary products** will now be **mandated** in the contract **for 2019-20**.



SCIENCE NEWS

VASCULAR RESEARCH

Blood clot discovery

Scientists have discovered new ways in which the body regulates blood clots, which could lead to the development of better treatments to help prevent and treat conditions including heart diseases, stroke and vascular dementia.

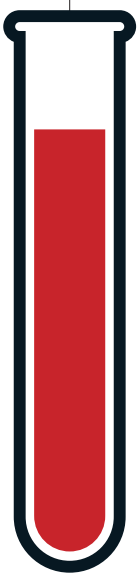
Led by the University of Exeter and funded by the British Heart Foundation, the team has developed a new technique that allows them to simultaneously measure blood clotting and the formation of free radicals.

Among other unwanted effects, free radicals play a role in the build-up of blood clots, which, in turn, are considered a key driver in the a development of a range of conditions, including heart disease, stroke, dementia, and inflammation-related conditions.

The technique combines electron paramagnetic resonance, a cutting-edge method for detecting free radicals, with aggregometry – an established technique for measuring blood clotting.

The team successfully used the technique in mice and in human cells. They aim to better understand how blood cells function, which will help to develop new drugs against blood clotting diseases.

→ **bit.ly/BS_NewsApr01**



STEM CELLS

SECOND PERSON TO BE **CLEAR OF HIV**

A UK patient's HIV has become "undetectable" following a stem cell transplant – in the second case of its kind.

The London patient, who was being treated for cancer, has now been in remission from HIV for 18 months and is no longer taking HIV drugs.

However, the researchers stressed it is too early to say the patient is "cured" of HIV.

Experts said the approach is not practical for treating most people with HIV, but may one day help find a cure.

The unnamed patient was diagnosed with HIV in 2003 and advanced Hodgkin's lymphoma in 2012.

He had chemotherapy to treat the Hodgkin's cancer and stem cells were implanted into the patient from a donor resistant to HIV, leading to both his cancer and HIV going into remission.

Researchers from University College London, Imperial College London, Cambridge and Oxford universities were all involved in the case.

→ **go.nature.com/2CchEKT**

CANCER RESEARCH

LIQUID BIOPSY FOR NON-SMALL CELL LUNG CANCER

A US multi-centre study revealed that a liquid biopsy is comparable to standard tissue biopsies in detection of guideline recommended biomarkers in advanced non-small cell lung cancer (NSCLC).

It also has a faster turnaround time, and has the potential to support identification of more patients who can be treated with targeted therapy.

The authors say the study findings are significant, given that 30% of lung cancers can be treated successfully with molecular-targeted therapies, which often yield higher response rates than chemotherapy.

Study lead Vassiliki Papadimitrakopoulou said:

30%

OF **LUNG CANCERS** CAN BE TREATED SUCCESSFULLY WITH **MOLECULAR-TARGETED THERAPIES**

"When choosing therapy for patients with NSCLC, it is vital that we know which patients have gene mutations that often respond to molecular therapies.

"In the past, our only option to test for mutations was to rely on tissue-biopsy-based testing, which can be invasive, have serious complications, is time-consuming and often not adequate to test for all relevant targetable mutations."

In this study, the liquid biopsy employed cell-free tumor DNA (cfDNA) in blood to test for mutations in 282 patients. It detected seven known predictive biomarkers.

Standard tissue sampling detected at least one of predictive biomarkers in 60 patients, while the liquid biopsy identified biomarkers in 77 patients.

Among the remaining 193 patients who did not have one of the seven biomarkers, the liquid biopsy test found the KRAS mutation in 92 patients, compared to 24 patients with standard tissue sampling.

→ **bit.ly/BS_NewsApr02**

IMAGES: ISTOCK/SHUTTERSTOCK

MEASLES

"US MISINFORMATION CAUSES EPIDEMIC"

The US reported more measles cases in the first two months of this year than in all of 2017, with public health officials blaming "misinformation" for the growing epidemic.

Six outbreaks of the disease have been reported across the country since the start of the year, totalling 159 cases, in the states of Washington, Colorado and New York.

Since 2000, between 50 and several hundred cases have been reported a year, even though the highly contagious disease was declared eradicated at the start of the century.

Public health officials who were summoned to the US Congress to discuss the rapid increase in conspiracy theories surrounding the measles, mumps and rubella (MMR) vaccine.

Dr Anthony Fauci, Director of the National Institute for Allergies and Infectious Diseases, said: "Misinformation is an important problem. The spread of misinformation that leads people to make poor choices, despite their well-meaning, is a major contributor to the problem we're discussing."

WILEY PRIZE

PIONEERING STUDIES IN PALEOGENOMICS

The 18th annual Wiley Prize in Biomedical Sciences will be awarded to **Svante Pääbo** and **David Reich** for sequencing the genomes of ancient humans and extinct relatives.

Their work reveals the origin and ancestry of contemporary humans and our diverse populations.

Svante Pääbo Director at the Max-Planck Institute for Evolutionary Anthropology in Leipzig, Germany. David Reich, is a Professor in the Department of Genetics at Harvard Medical School.

Titia de Lange, Chairperson of the Awards Jury for the Wiley Prize at The Rockefeller University in New York City, praised their work.

"The 2019 Wiley Prize recognises Svante Pääbo and David Reich for their pioneering studies of ancient human DNA that revealed the origin and migration of contemporary humans and our relationship to extinct relatives," she said. "The Wiley Foundation honours research that champions novel approaches and challenges accepted thinking in the biomedical sciences."

WHAT'S HOT AND WHAT'S NOT

HOT

RESISTANCE TRAINING

A new paper points to the benefits of exercise, especially resistance training, for preventing type 2 diabetes.

HOT

BREAKFAST

Children who skip breakfast tend to have an unhealthy lifestyle profile, according to an observational study from Greece.

HOT

ROBOTS

Research suggests that artificial intelligence systems may be able to perform as accurately as radiologists in the evaluation of digital mammography.

NOT

MEN

First-time women principal investigator scientists in the US receive considerably less funding than first-time male principal investigators.

NOT

NUTRITIONAL SUPPLEMENTS

Daily intake of nutritional supplements cannot prevent depression, states a randomised clinical trial.

NOT

PLANES

Passengers and crew on a flight from Barbados to Gatwick in February were quarantined on landing due to widespread sickness on-board the plane.

POINT-OF-CARE TESTING

"POCT BENEFITS PATIENTS AND CUTS COSTS"

On-site pathology testing is allowing remote Australians to receive effective emergency medical treatment, while saving millions, according to researchers.

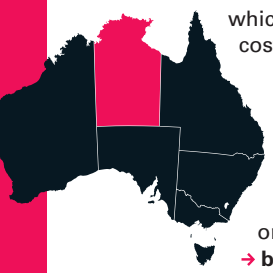
In a study funded by the Emergency Medicine Foundation Australasia, a research team assessed both the medical and cost benefits of using point-of-care testing (POCT) for acute medical care in six remote health clinics in the Northern Territory over a six-month period.

It is one of the first projects in the world to quantitatively evaluate the clinical and economic benefits of POCT in a remote setting, according to the team.

Project Coordinator Brooke Spaeth said: "Up to now, we had very little hard research data to support the cost benefits of using POCT, it was mostly anecdotal.

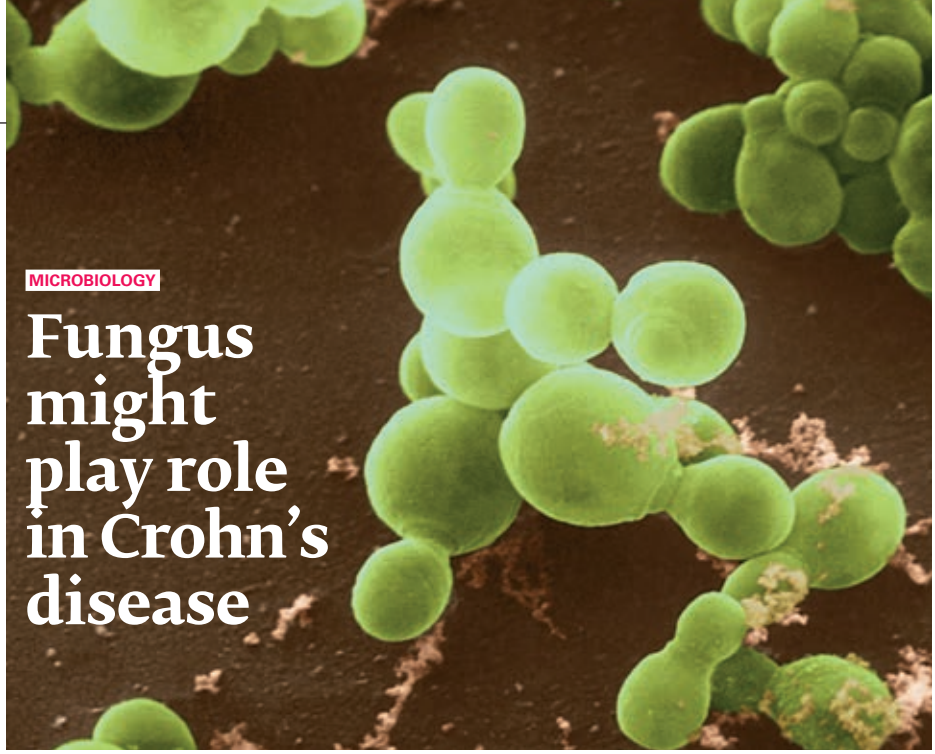
"We now have proof that the technology improved the clinical and operational outcomes for acutely ill patients in remote communities in the Northern Territory."

It reduced the need for medical evacuations by up to 35% in the clinical conditions investigated, which led to "significant cost savings".



The research team evaluated the use of POCT for 200 patients suffering from acute chest pain, acute diarrhoea or acute renal failure.

→ **bit.ly/BS_NewsApr03**



MICROBIOLOGY

Fungus might play role in Crohn's disease

A fungus commonly found in human hair follicles also resides in the gut and might play a role in Crohn's disease, it is reported.

Malassezia yeasts may worsen intestinal disorders, such as inflammatory bowel disease, in patients who have a certain genetic makeup, researchers claim.

It is not known how the microscopic fungi– which are linked to skin conditions, including dandruff – end up in the gut, or what they do there.

Co-author of the research David Underhill said: "We were surprised to find that *Malassezia restrica* was more common on intestinal tissue surfaces in Crohn's disease patients than in healthy people.

"Further, the presence of *Malassezia* was linked to a common variation in a gene known to be important for immunity to fungi – a genetic signature more common in patients with Crohn's disease than the healthy population."

The authors stated their data does not suggest that the presence of *Malassezia* in the gut is an inherently bad thing.

They said it does not seem to cause disease in the gut by itself, but "if there is some intestinal inflammation, *Malassezia* seems to make it worse".

→ **bit.ly/BS_NewsApr04**

IBD *MALASSEZIA* YEASTS MAY **WORSEN INTESTINAL DISORDERS**, SUCH AS INFLAMMATORY BOWEL DISEASE, IN PATIENTS WITH A CERTAIN GENETIC MAKEUP, RESEARCHERS CLAIM.

UNDER THE MICROSCOPE

This month: Takotsubo cardiomyopathy

What happens with takotsubo cardiomyopathy?
Your heart muscle becomes suddenly weakened. The left ventricle, gets larger and changes shape, meaning it doesn't pump blood to the rest of the body as well as it should.

So it gives you a broken heart?
Funny you should say that, as the condition is commonly known as "broken heart syndrome" as the weakening and failing often happen suddenly after an emotional or stressful event, such as bereavement.

Has this been in the news?
Swiss researchers have been studying people with this rare condition and have reported their findings in the *European Heart Journal*. Dr Jelena Ghadri and colleagues at University Hospital Zurich looked at what was happening in the brains of 15 patients with broken heart syndrome.

What did they find?
Brain scans showed up noticeable differences in comparison to scans from 39 healthy, control patients. There was less communication between brain regions involved with controlling emotions and unconscious or automatic body responses, such as heartbeat.

What does that mean?
It is conceivable that the disease originates in the brain and has a "top-down" influence on the heart.

It *proves* that, doesn't it?
Because scans of the patients' brains before they developed broken heart syndrome were not available, the exact pathway can't be understood – it can't be known if the decreased communication between brain regions caused the takotsubo cardiomyopathy, or vice versa.

IMAGES: ISTOCK/SCIENCE PHOTO LIBRARY

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TECH NEWS

MAST

RAPID DETECTION

Mast Group Ltd has launched the Mast Carba Pace for rapid carbapenemase detection in *Pseudomonas*, *Acinetobacter* and Enterobacterales.

It has developed a colorimetric test which rapidly detects carbapenemase producing *Pseudomonas spp*, *Acinetobacter spp* and Enterobacterales, using a novel chromogenic cephalosporin analogue.

The test involves five simple steps and delivers results in less than 10 minutes.

→ **mast-group.com**

BIOCOTE

ANTIMICROBIAL

BioCote has invested over £600,000 in larger headquarters and a new laboratory, and has increased staff numbers.

The move will enable the company to meet rising demand for its antimicrobial additives, which are integrated into products to make them easier to keep hygienically clean and less likely to cause cross-contamination.

BioCote has achieved a 15% increase in revenue over the last year, with customer numbers on the rise.

→ **biocote.com**

SYNGENE

IMAGE ANALYSIS

Syngene has introduced a new Epi UV HI-LED lighting option for its popular G:BOX Chemi and G:BOX mini multi-application gel and blot imaging systems.

These environmentally friendly lights allow faster workflow and more accurate results when imaging a diverse range of fluorescently labelled proteins on gels and blots.

With an excitation wavelength of 365nm, the Epi UV HI-LED lights transform G:BOX Chemi and G:BOX mini systems into higher-performance imagers capable of detecting SYPRO Ruby labelled proteins, colonies and proteins labelled with wtGFP, as well as fluorescent proteins on TLC plates.

→ **syngene.com**

THE BIG QUESTION

THIS MONTH WE ASK

Is the NHS falling behind the technology curve?

Jamie West

Deputy Head Biomedical Scientist, Clinical Biochemistry and Immunology
North West Anglia NHS Foundation Trust

It's an easy accusation to make to say that, given its scale and complexity, the NHS is a slow-moving oil tanker, resistant to change. There are cases where the NHS has been slow to adopt new technologies and innovations and there is (rightly) pressure from the public to implement improvements in a timely manner.

I have a more optimistic view of the NHS' position, particularly in pathology. At a minimum, our quality management system mandates that we have the technologies required to meet the needs of our service users. This helps ensure that, in the vast majority of cases, outdated systems are identified as a risk to be addressed.

In addition, we've seen a number of new tests (and improvements in the use of existing tests) within the NHS over the last 10 years.

The UK and Europe have been quicker to adopt high sensitivity assays for cardiac troponins, for example, and there are a growing number of examples of pathology tests being adopted as low-risk, low-cost interventions to identify patients who may require further higher-risk or higher-cost interventions.

We appear to have got better at asking the right questions, focusing on patient journeys and outcomes, looking at the impact we can have across the whole health economy. If we continue this approach, pathology can lead technology-based improvement.

IMAGE: ISTOCK

Dame Sue Hill

Chief Scientific Officer for England
NHS England

Keeping up with the pace of technological advance is a challenge for all health systems around the world, but an area where the NHS is justifiably proud of being at the cutting-edge of new technologies and driving wholesale adoption.

This is exemplified by the pioneering use of whole genome sequencing in routine care, through the NHS contribution to the 100,000 Genomes Project – followed by the comprehensive uptake of all genomic technologies across the entire country through the creation of the NHS Genomic Medicine Service (GMS) with its National Genomic Test Directory. These are recognised as world-leading initiatives and the NHS GMS is committed to keeping up with the curve by annually updating the test directory as the evidence for new technologies develops.

In recent months we've seen the first patients treated in an NHS high-energy proton beam centre, and the first young cancer patients in Europe to receive personalised CAR-T treatment as part of a regular service. The partnerships at Moorfields Eye Hospital have made great strides in data science, showing how artificial intelligence and machine learning can deliver for patient and service benefit. This area will only continue to grow with substantial investment through the Government's Life Sciences Industrial Strategy.

There will always be more work to do, but there are now the mechanisms and the models to demonstrate that rapid adoption at scale and pace can be achieved.

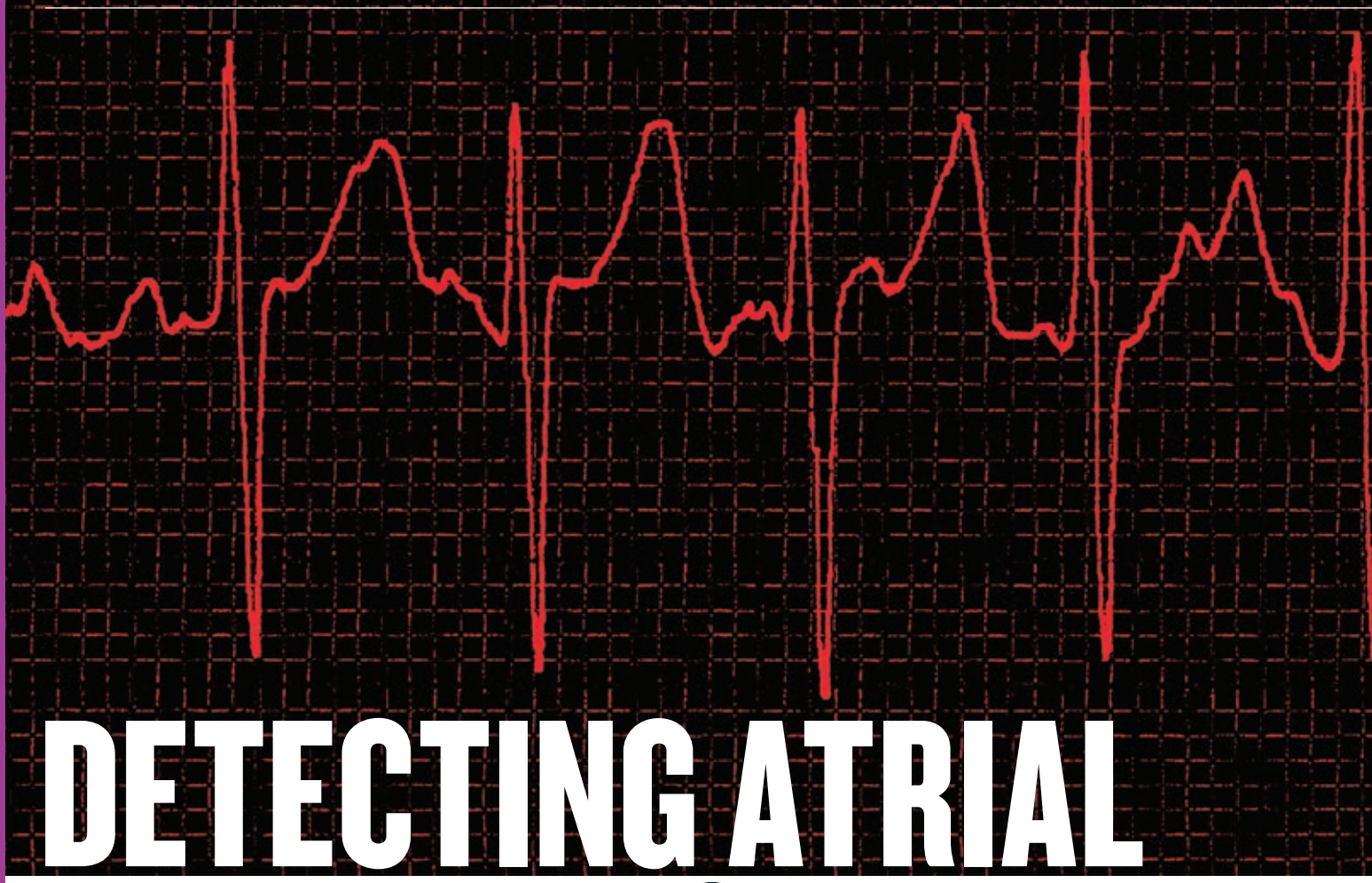
Robert Simpson

Hon. Treasurer and Council member
Institute of Biomedical Science

Overall, I don't think the NHS is behind the curve, it's a never ending race to keep pace though. Biomedical scientists and our clinical and managerial colleagues are sensibly risk averse, wanting to see that new technology is safe, reliable, clinically effective and cost efficient. The National Institute for Clinical Excellence has developed a technology assessment process which looks at the clinical and economic evidence for adoption.
The public must also be confident about new technology in healthcare, which can take time. Sometimes there is a public clamour to adopt, for example proton beam therapy, sometimes there is caution and concern.

Pathology has adopted various mass spectrometry and molecular techniques for a range of analytical work in recent years, just two examples of the introduction of new technology into laboratories. Pathology is using innovations in IT technology in the laboratory, NHS Digital is collaborating with pathology professionals to develop new pathology information standards and a messaging system to support complex analysis of pathology and other clinical data to aid clinical decision making. More generally the 100,000 Genomes Project is cutting edge.

I prefer to think of technology adoption as a conveyor belt, new technologies come on at one end and old ones drop off at the other, which leads me to ask how good is the NHS at stopping using old technology? Perhaps that's a future "big question".



DETECTING ATRIAL FIBRILLATION

Could routine screening for atrial fibrillation be in the pipeline? **Jonathan Mant** is leading the programme that he hopes will be the catalyst.

Every year in the UK around 100,000 people have a stroke. More than 40,000 died as a result of the condition in 2015, making it the fourth leading single cause of death.

A stroke happens when the blood supply to a part of the brain is suddenly curtailed or cut off, starving the brain cells of vital oxygen and nutrients, and causing severe temporary and permanent damage. The major risk factors for a stroke are high blood pressure, obesity and smoking. But it can also be triggered by cardiac conditions, among them atrial fibrillation.

The underlying cause of atrial fibrillation is uncertain, but abnormal electrical impulses mean that parts of the heart move more randomly that they should, which disrupts the overall rhythm. It is thought to affect around one million people, though it is most prevalent among the over 65s. Anybody with atrial fibrillation has a substantially increased risk of suffering a stroke.

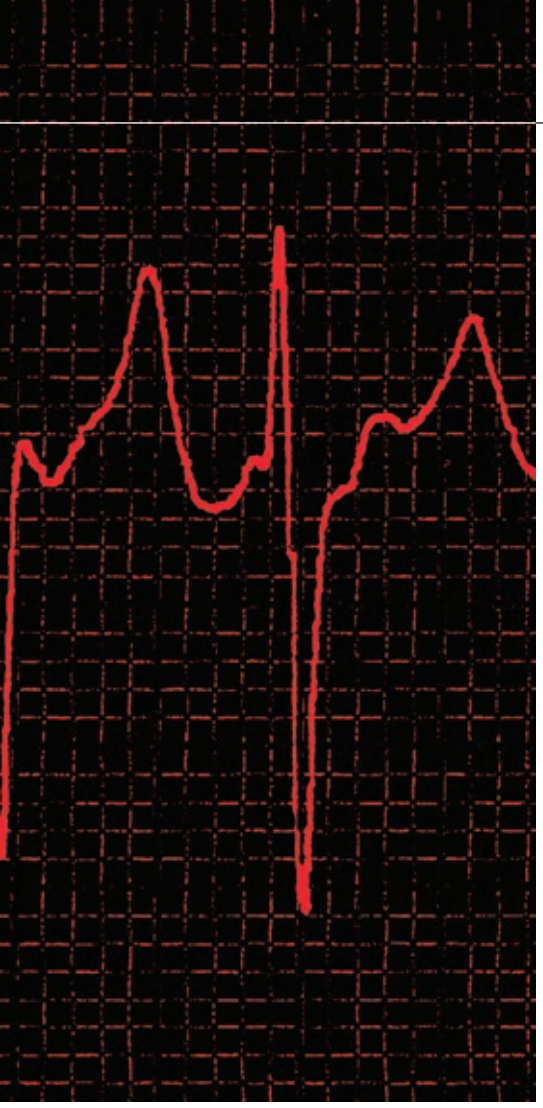
Screening

With this in mind, a new study is to consider the benefits of a major screening programme for atrial fibrillation. Could it help to save lives?

Researchers from the University of Cambridge and other academic institutions are set to start work on the extensive trial that will centre around GP practices in East Anglia. Jonathan Mant, Professor of Primary Care Research at the University of Cambridge, is the senior investigator.

"We know that atrial fibrillation is a strong risk factor for stroke," he says. "Somebody with the condition has about a five-fold greater risk. It is also a getting more common, particularly in older people. It gets more likely in an ageing heart, and as the population is getting older, we are seeing more of it. Another factor is that people now have much better chances of survival with coronary heart disease and other heart problems."

Coupled to this rising prevalence is the problem that atrial fibrillation often shows no symptoms. "People can be completely unaware that they have got it," says Mant. "Equally, it can sometimes present with symptoms. With atrial fibrillation the heart isn't beating



efficiently, so people can feel breathless, particularly when they are exerting. They might also be aware that their heart is beating strangely, which can make them feel faint and dizzy."

Feasibility study

Stroke is not the only problem, either. "It is also associated with heart disease and there is also increasing evidence linking it to cognitive decline and dementia," says Mant.

The key questions for the research are can screening help to prevent premature deaths and dementia in the target population, and will the benefits outweigh any potential harm it might cause?

The research has three phases, the first of which is a feasibility study where the team is refining its plans for carrying out the screening. "We have started in five local GP practices and then we will extend the feasibility test to another six practices in a few months' time," says Mant. "This is to hone the procedure, but also checking that people are willing to take part. At this stage they are all offered the screening."

Patients will conduct the screening themselves at home, using a handheld device to record their ECG. The reason for this is that atrial fibrillation often comes and goes at different times, so the home screening has a better chance of detecting cases of intermittent atrial fibrillation that might otherwise be missed in a one-off test during an appointment with a GP.

The pilot

The second phase is a much wider pilot of a randomised control trial. "At this point we will be randomising practices, so some do the screening and others do not," says Mant. "This will involve 30 practices with 400 patients each, so 12,000 people in all, and that will take place over a year."

During the pilot the research team will be checking that it is picking up the expected level of undiagnosed atrial fibrillation, and that those patients are receiving appropriate treatment. "Obviously, if we are not successfully detecting and treating the condition, it would be futile to continue. On the basis of the data we collect, we will decide whether it is feasible to extend the trial to its full extent, which would recruit another 270 practices and a total of 120,000 patients that we would follow-up for five years."

Mant's feeling is that it will go to the full trial. "Preliminary data from other parts of the world, such as Sweden, suggest we will probably pick up undetected atrial fibrillation in about 3% of people we screen. And in terms of clinical practice, most people newly identified with atrial fibrillation are already being treated properly."

Routine screening

The main treatments for atrial fibrillation are anti-coagulation drugs. "The key reason it causes stroke is that it increases the risk of clots forming in the blood stream, typically in the heart or arteries, and they end up in the cerebral circulation. Many trials since the early 1980s have demonstrated that blood-thinning is very effective at reducing the risk of stroke, so we know that the treatment works."

The other key consideration for the trial is to ensure there are no drawbacks. "With screening there are always concerns that you may be causing inadvertent harm," says Mant. "It can cause anxiety, for example. We also don't know the prognosis of atrial fibrillation that is first detected by screening, and if the risks of stroke are lower for these people, we may be doing more harm than good by treating them.

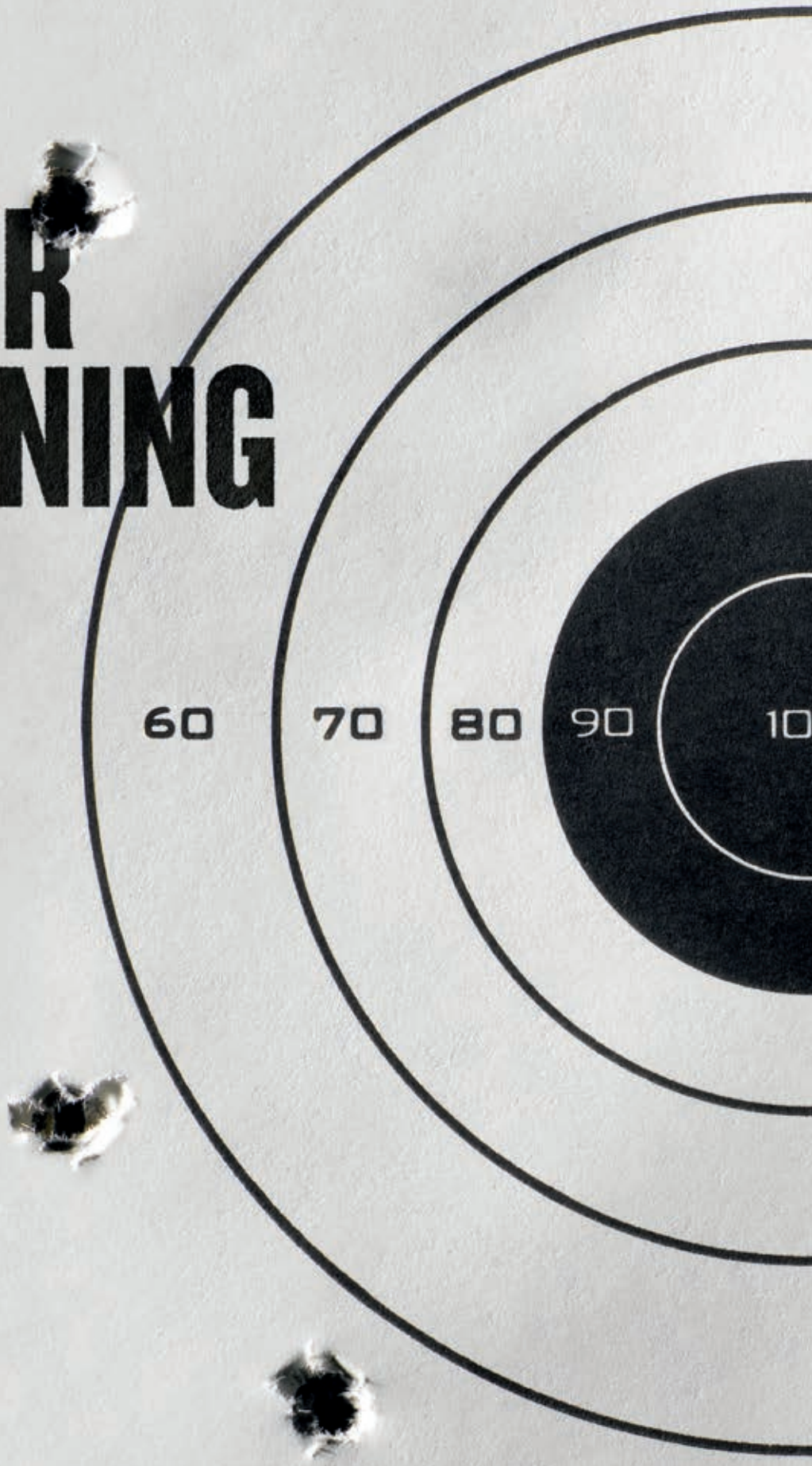
"While we believe the programme will be highly effective, we do need to test that properly. If the trial is positive, if we demonstrate that we are reducing strokes and saving lives, and that we show it is good value for money for the NHS, then our hope and expectation is that it would be taken up as a new national screening programme, so that people in the target age range are routinely invited to be screened for atrial fibrillation." BMS

JONATHAN MANT

- ✔ Trained as a public health physician in Oxford.
- ✔ Lectured in public health medicine at the University of Oxford, 1992-97.
- ✔ Worked in the department of primary care and general practice at the University of Birmingham 1997-2008.
- ✔ Moved to the University of Cambridge in 2008, now Professor of Primary Care Research and Head of the Primary Care Unit.
- ✔ Fellow of the Academy of Medical Sciences, and NIHR Senior Investigator.

CANCER SCREENING

With a new report showing that targets for cervical, breast and bowel cancer screening programmes in England have been missed, we explore the limitations and ask what action is needed.



Nearly 8 million people were screened for breast, bowel and cervical cancer in England between 2017 and 2018. Yet, none of these screening programmes met their targets, according to a recent report by the National Audit Office (NAO).

This independent investigation was published after two events raised concerns about the management of England's screening programmes. In May 2018, it was revealed that more than 120,000 women aged 69 to 71 had not been invited for their final breast screening between 2009 and 2018, due to a failure in the computer algorithm used

71.7%

CERVICAL SCREENING: 71.7% OF ELIGIBLE PEOPLE SCREENED 2017-18

59.6%

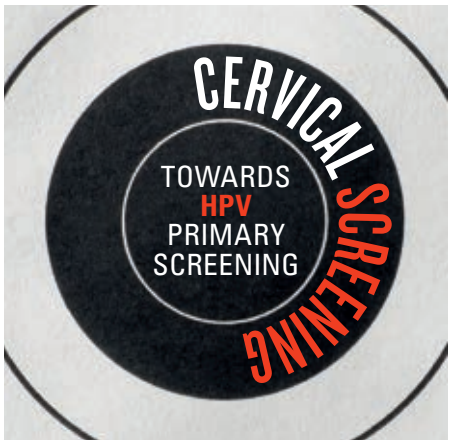
BOWEL SCREENING: 59.6% OF ELIGIBLE PEOPLE SCREENED 2017-18

72.1%

BREAST SCREENING: 72.1% OF ELIGIBLE PEOPLE SCREENED 2017-18

to manage these invitations. A failure in the cervical screening programme was also identified, with more than 40,000 women believed not to have received an invitation, and a further 4,500 women not getting their results in the post.

Since the Health and Social Care Act 2012, the delivery of screening programmes has been delegated by the Secretary of State for Health and Social Care to NHS England. The National Audit Office's report looked at how this delivery was carried out for the three main screening programmes based on age – bowel, breast and cervical – as well as their performance and oversight. It identified number of problems, including the fact that all rely on complex and ageing IT system, based on 83 databases of GP registrations, collectively known as National Health Application and Infrastructure Services (NHAIS). The delivery of the programmes also appears to be characterised by important inequalities between different areas of England, with London consistently scoring poorly in terms of screening coverage.



For the first time, in 2017-18 two standards were set up to assess the performance of programmes. Known as the "lower threshold" and the "standard threshold", they are respectively the lowest level of performance that programmes are expected to attain, and the level at which programmes are likely to be running optimally.

Although none of the programmes reached their standard threshold, the cervical screening programme was the only one that failed to also attain its lower threshold. It achieved a coverage of 72% of the population eligible for screening, against a standard target of 80% and a lower threshold of 75%.

It is worth noting that twice as much is spent on bowel screening and breast screening than on cervical screening, but also that multiple factors can explain why reaching out to the women can be difficult.

IT systems

The report suggests that the use of unreliable IT systems to send invitations out is particularly problematic.

Cervical screening started in 1988 in England, so the programme relies on many IT systems which are more than 30 years old.

Additionally, the high number of databases that are used in order to identify women who need to be invited adds complexity to the whole system, which goes some way towards explaining some of the missed opportunities to contact them.

There is, however, no simple solution to this. Dr Allan Wilson, Lead Biomedical Scientist in Cellular Pathology and Advanced Practitioner in Cervical Cytology at Monklands Hospital, says: "Attempts to move to a single database face considerable challenges as coding has been done locally in many areas, so it's very difficult to move forward to a single database. The cervical screening programme needs retrospective data, which exists in a number of different IT systems, using different codes; putting them in a robust single database will be extremely challenging, as the data is inconsistent and fragmented."

Lack of awareness in the population about the relevance of cervical screening is also a problem. To address it, the first cervical screening advertising campaign was launched in England at the beginning of March 2019 to raise awareness in the population targeted by the programme. "Most of the cancers that are arising now are in women who had never been screened or have attended infrequently. We will only make significant reductions in incidence and mortality if we focus on engaging with those individuals," Wilson says.

Pressure on labs

However, some experts are concerned that this type of campaign will result in more pressure for the cytology labs responsible for analysing the tests.

80%

IS THE STANDARD TARGET FOR CERVICAL SCREENING COVERAGE. HOWEVER, THE PROGRAMME ACHIEVED 71.7%.

At present, women who do manage to attend screenings are often faced with delays to receive their results, as labs are overwhelmed with the volume of samples they have to analyse.

At least 98% of women should receive their results within 14 days of their cervical screening appointment, but this target has not been met since 2015, and as of December 2018, just over half of women were getting their results on time.

Estimates suggest that there is currently a backlog of more than 97,000 samples waiting to be tested.

HPV primary screening

It is thought that these delays are directly linked to staffing changes in labs, and to concerns about the move to HPV primary screening. Announced in 2016, this measure involves testing women for HPV first, to identify those who would benefit from further analyses. It is expected to reduce the number of labs carrying out cytology analyses from 48 to nine.

"There has been a closure of many cytology labs and workload has transferred to large centralised centres, which were hard to reach for a lot of the staff who chose not to transfer with the workload.

"The move to HPV primary screening will lead to an 85% reduction in the cytology workload. Consequently, staff are facing an uncertain future, with a number already leaving the service ahead of the transition. The effect of this loss is a gradual reduction in screening capacity," Wilson points out.

In the long term, HPV primary screening is nevertheless expected to reduce pressure on the remaining labs, as well as delays for women to receive their results, and to move on to treatment if need be, by leading to more efficient triage and to analyses of only of the most problematic samples.

"This is a worrying phenomenon, and it may merit a campaign similar to the one currently occurring for cervical screening"

Stephen Duffy, Professor of Cancer Screening at Wolfson Institute of Preventive Medicine

The breast cancer screening programme achieved a coverage of 72.1 % in 2017-18, surpassing its lower threshold of 70%. As the report points out, the proportion of the eligible population screened for breast cancer has remained broadly static in recent years, but there are areas of concern. Stephen Duffy, Professor of Cancer Screening at Wolfson Institute of Preventive Medicine, in London, says : "In world terms, 72% is good performance, and is above the recommended 70%. However, it is lower than it was 10 years ago, and uptake of the screening is even lower for first screening invitations. This is a worrying phenomenon, and it may merit a campaign similar to the one currently occurring for cervical screening."

So, what are the clinical implications of not reaching the target? Dr Nora Pashayan, a Senior Clinical Lecturer in Applied Health Research at University College London, and colleagues have tried to get an idea of the potential impact of a lower screening uptake, by taking the worst case scenario – assuming women who do not get screened at 50 never attend a screening after that – and modelling the likely outcome of screening.

"If we take 10,000 women aged 50 (and the worst case scenario where a proportion never attends screening) there would be 14 fewer breast cancer diagnoses and there would be six more deaths from cancer, if we achieve a coverage of 70% than if we achieve a coverage of 80%. But you would also have three fewer over-diagnoses," Pashayan explains.

Just like for the cervical screening programme, many factors may explain why the standard target is difficult to achieve. Ageing IT has also been blamed for failing to send invitations out to the women between the age of 50 and 71 years old who are targeted by the programme. In fact, the 2018 Independent Breast Screening Review suggested that the IT on the breast screening programme is "dated and unwieldy", with about 5,000 women not invited to their final breast screening because of errors in the system.

Range of solutions

However, focusing only on IT issues will not solve the problems faced by the programme entirely. Increasing the number of women attending screening will require a range of solutions, as well as research into what motivates them to engage with the programme. "The question we need to ask ourselves is who are the women we are missing. We

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SUMMARY OF THE NAO REPORT

- **The funding the Department** provides to NHS England to deliver its delegated public health functions is ring-fenced.
- **NHS England's objectives** for health screening include commissioning high-quality services and reducing health inequalities.
- **All the screening programmes** rely on a complex and ageing IT system to identify who to invite for screening.
- **None** of the adult screening programmes met their 'standard' coverage target during 2017-18.
- **Levels of coverage** in screening programmes are inconsistent.
- **Performance** on screening programmes is below expected levels.
- **Women should be invited** for a repeat breast screening within 36 months of their previous appointment.
- **At least 98% of women** should receive their results within 14 days of their cervical screening appointment, but this target has not been met since November 2015.
- **NHS England** has delegated responsibility for managing the performance of screening providers to local teams.
- **Public Health England** reviews screening quality but does not have the power to enforce recommended changes.
- **The events reported to Parliament** in 2018 have raised concerns about the effectiveness of the governance arrangements, which assume that all the eligible population have been invited for screening.
- **Delivery of health screening** is subject to significant and ongoing change.
- **The roll-out of primary HPV testing** was announced in 2016 and is not expected to be fully introduced until December 2019.
- **Public Health England and NHS England** has succeeded in implementing bowel scope screening with 64 out of 65 screening centres operational at the end of 2016-17.

don't know whether people are not coming because of their personal preferences, after deliberating about the potential benefits and harms of screening, or because they just don't have the time in their lives, or fear having a diagnosis of cancer. So, we don't know how much of it is an informed decision. It may be that some people are not sure about the purpose of screening and its relevance to them, or they are, but they think that whatever they do, cancer will necessarily have a bad outcome," Pashayan says. Another area of improvement is linked to the time women wait between two screenings. The breast screening programme in England was set up with the idea that women should be invited for a repeat breast screening within 36 months of their previous appointment. However, the standard target of 100% women invited within this timeframe has never been reached.

Public campaigning

Not everyone agrees that a large public health campaign may be the best solution to push women towards screening. "We need to be talking to women individually, at a community level, about their own risk, their own beliefs and their own situations, and the potential benefits and harms of screening. It's a time to move on from one-size-fits-all approach to a more personalised approach, in both screening and in raising awareness about screening – screening targeted to those who would benefit most and who would be harmed least," Pashayan concludes.

80%

IS THE STANDARD TARGET FOR BREAST SCREENING COVERAGE. HOWEVER, THE PROGRAMME ACHIEVED 72.1%.

In 2017-18, bowel screening narrowly missed its standard target, achieving a coverage of 59.6% against a target of 60%. Spending on bowel screening increasing by £57.5m in England since 2013-14, which may explain this. However, these numbers hide important geographical inequalities. "If we look at overall uptake, then around 60% uptake in England is relatively good for a programme like bowel screening, given that we know some people are put off by the idea of testing their bowel motions for hidden blood. However, it is important to be aware of uptake across the population and how an average uptake can mask very poor levels in particular groups or communities. The least well off are significantly less likely to take part in bowel screening than the most well off and we know men are less likely to take part than women," says Jennifer Darnborough, lead of all screening programmes in Lanarkshire, Scotland.

The bowel screening programme has also been subject to changes in delivery. In 2011, the UK National Screening Committee recommended that a one-off bowel scope screening should be introduced for people aged 55 years in addition to the existing bowel screening test. To allow for these new arrangements, the opening of 65 new screening centres across England was planned, 64 of which were open as of 2017. Yet, the report suggests that fewer

60%

IS THE STANDARD TARGET FOR BOWEL SCREENING COVERAGE. HOWEVER, THE PROGRAMME ACHIEVED 59.6%.

people than expected have received this one-off bowel scope screening, as less than half of all GP practices are presently linked to these centres.

Increasing engagement

Another change in the programme was the decision to move from the existing faecal occult blood (FOB) test to faecal immunochemical testing (FIT) by April 2019. "The introduction of FIT is a step forward, as this screening test is viewed more positively than the FOB test.

"With FIT, only one sample is required (as opposed to three separate samples with FOB) and it appears to be less offensive and simpler to do to the public. However, as with FOB testing, there is a high volume of false positives, which puts pressure on diagnostic colonoscopy services," says Darnborough.

Running more targeted campaigns in geographical areas where screening uptake is low may be a solution to increase engagement with the programme, with the support of community health educators or with people who have gone through the screening programme and could work locally with in the public. This may involve explaining why screening is relevant but also responding to people's concerns. "We know that, for some individuals, their response to a screening invitation is not always rational. Some may have a very strong emotional response which professionals need to be able to recognise and engage with on an emotional basis. A previous bad experience can be very powerful," Darnborough concludes. BMS

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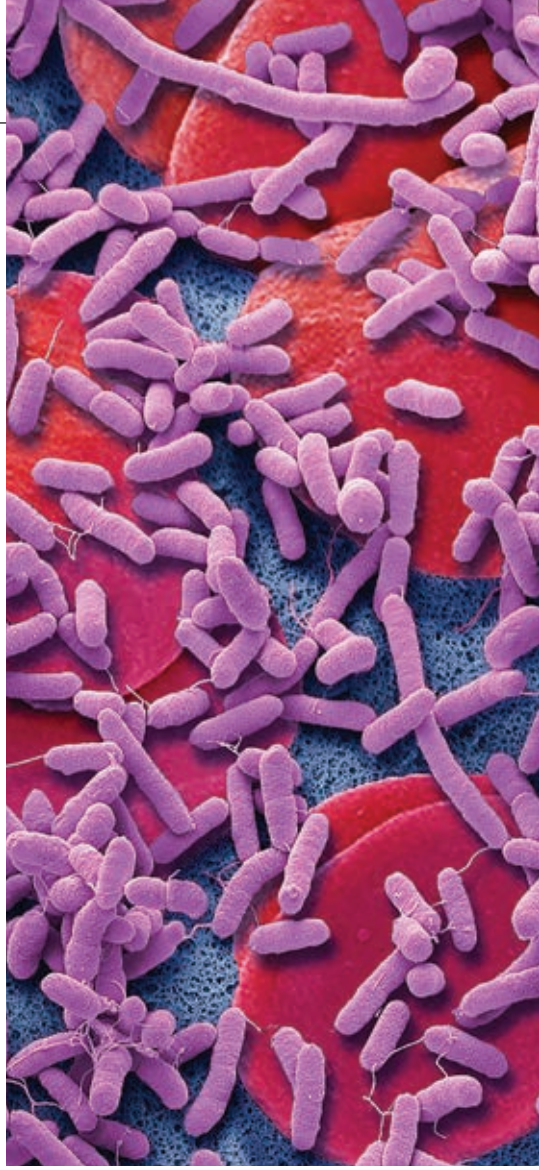


DETECTING THE SILENT KILLER

Rushana Hussain, Clinical Scientist at Royal Bolton Hospital, writes about rapid sepsis detection with MALDI mass spectrometry.

Sepsis – the overreaction of the body's immune system to infection – is a prevalent global health threat. It costs the NHS England approximately £2bn per year to treat, and claims the lives of around 31,000 people. Globally, there are an estimated 31 million cases of sepsis per year, with six million resulting in death.

There has long been a need for rapid detection and identification of the infecting organism in blood cultures to ensure a timely response for the management of sepsis. Without this, patients can suffer from septic shock and organ failure, often resulting in death. While broad spectrum antibiotics are generally the first step in treating sepsis patients, in a high proportion of cases, an early identification of the infecting organisms would enable a change in therapy where appropriate, therefore lowering mortality rates, decreasing treatment costs and improving patient outcomes.

A change in technology

Most clinical laboratories use biochemical methods as standard laboratory practice (SLP) to identify detected organisms from the sample, which can only provide information about the infecting organism once it is cultured, approximately after 24 hours. This uncertainty and delay in information limits the specificity of antibiotics that can be used for treatment.

Mass spectrometry (MS) has emerged as the gold standard for microorganism identification in clinical laboratories across the world. The Microbiology Department at the Royal Bolton Hospital (RBH), UK, has introduced matrix-assisted laser desorption/ionization (MALDI) time-of-flight (TOF) MS, alongside an innovative positive blood culture preparation kit, to accurately identify organisms in sepsis cases. Combining these methods is emerging as a powerful technique for rapid organism identification from a blood culture.

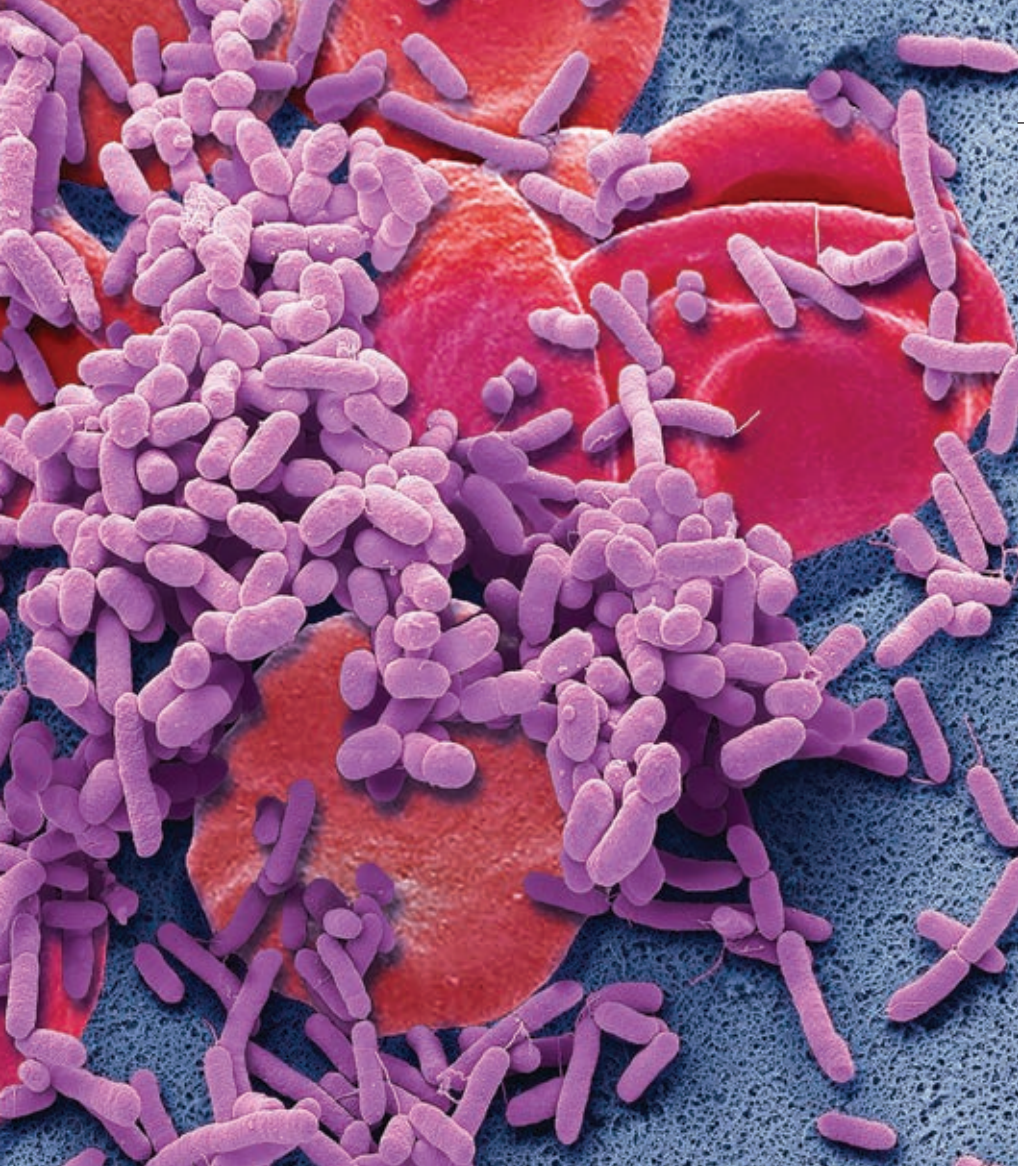
Evaluating MALDI-TOF MS

The RBH conducted a retrospective analysis of the processing of positive blood culture broths collected from patients admitted to the A&E department with suspected sepsis, to establish whether faster and more accurate diagnosis could be achieved using MALDI-TOF MS diagnostic tools, compared to the current SLP.

During April and May 2015, the microbiology laboratory implemented the MALDI-TOF MS protocol for processing positive blood culture broths, which was compared to the SLP (audit performed April to May 2014) to determine potential improvements in time to clinical results and patient pathways. Blood samples of patients who were suspected as having sepsis were sent to the microbiology laboratory for processing to determine the identity of the infecting organism, and all samples that were flagged positive for growth were subjected to Gram staining.

Cost savings and patient outcomes

The study found that although the use of MALDI-TOF MS takes additional time to perform, there was no delay to the availability of the Gram stain result and there was a significant improvement over the SLP of up to 23 hours in TAT for a presumptive identification. There was also a reduction of hospital stay duration for patients with bacteraemia during the MALDI-TOF MS period compared to the SLP. On average, for Gram positive bacilli, time spent in hospital was reduced by



Left. Sepsis. Composite coloured scanning electron micrograph. Bacteria amongst the red blood cells from the circulatory system

IMAGES: SCIENCE PHOTO LIBRARY

"This reduction is a reflection on the earlier and more accurate identification"

1.6 days, and 1.8 days for Gram positive cocci. This reduction corresponds to a significant cost reduction for the hospital.

In addition to length of stay in hospital, the cost implications of implementing the MALDI-TOF MS protocol considered the use of intravenous (IV) and oral antibiotics. Analysis of this data at RBH has shown a 33% reduction in doses of IV antibiotics and a 35% reduction in oral antibiotics using the MALDI-TOF MS protocol compared to SLP over a similar time period. This reduction is a reflection on the earlier and more accurate identification of the organism, enabling the clinical team to make informed decisions and alter antibiotic regimes 18 hours sooner. Knowing the actual identification of the organism enables clinicians to tailor antibiotic treatment and reduce overall antimicrobial use across the hospital.

An associated positive effect of a reduction in IV antibiotic usage is the expected reduction in nursing time to administer the therapy. In addition, reducing antibiotic use falls in line with National Institute for Health and Clinical Excellence (NICE) Guidelines on Antimicrobial Stewardship, by reducing the risk of multi-drug resistance through hospital acquired infections.

Hospital- and economy-wide advantages

For the clinical management of sepsis patients, it is important to identify the organism quickly in order to change empiric antibiotic regimens to a more targeted therapy. The MALDI-TOF MS protocol has shown 90% sensitivity and 100% specificity in laboratory investigations. This level of information enables clinicians to make confident, informed decisions in personalising antibiotic regimes, or altering patient pathways, which typically lead to better patient outcomes.

The benefits of treating sepsis in a targeted manner have significant impacts on quality of life for many patients who have sepsis. Faster diagnosis and treatment of the condition reduce the risk of long term patient morbidity (sometimes referred to as post sepsis syndrome or PSS) or life-changing physical and mental conditions.

Fighting sepsis in the future

MALDI-TOF MS can provide identification of an infecting organism in the blood approximately 18-23 hours earlier than traditional biochemical methods. This faster TAT provides the clinician with timely and accurate information, enabling an informed clinical assessment of the patient, to prescribe the correct antibiotics promptly, and instruct the removal of lines and indwelling catheters where possible, as well as request additional investigations.

Cost is often a barrier to organisations considering new technology. Although it is difficult to calculate all the financial implications across the patient pathway, data from RBH shows additional cost savings arise from a reduced length of hospitalisation and reduced use of antibiotics following the implementation of MALDI-TOF MS protocol into the hospital microbiology laboratory workflow. The laboratory is currently assessing how taking additional sets of blood cultures and improving transport time to the laboratory could improve the workflow and TATs further. BMS

Rushana Hussain is a Clinical Scientist in the Microbiology Department at the Royal Bolton Hospital.

RECOGNISING PSEUDOHYPERNATRAEMIA

Biochemistry lead **Dan Kelly** looks at sodium citrate contamination and how to identify the condition.

Hypernatraemia is defined as high concentration of serum sodium in the plasma, typically above 145 mmol/L. The condition represents a deficit total body water relative to sodium that can arise due to a number of different causes, including free water loss, reduced intake of water, and sodium overload. Hypernatraemia is a common condition among hospitalised patients, particularly in intensive care units, and is an independent risk factor for mortality. Mild cases of hypernatraemia (145 – 150 mmol/L) are frequently asymptomatic but severe hypernatraemia (>155 mmol/L) can cause significant central nervous system dysfunction that clinically presents with symptoms of encephalopathy (headache, nausea, confusion, lethargy) that can progress to seizures, coma and death, if the condition is left untreated. Thus, severe hypernatraemia requires urgent medical treatment and is a cause of clinical concern.

In the clinical chemistry laboratory, it is critical during technical validation that severe hypernatraemic results are verified to ensure accurate reporting of sodium levels. Any inaccurate reporting of sodium levels may lead to unnecessary clinical investigations and treatment that is detrimental to the patient. Sodium results that are not truly reflective of the patients blood serum is called pseudohypernatraemia. Common causes of pseudohypernatraemia include: venepuncture around intravenous infusions, as well as sample evaporation, particularly with low volume samples that concentrates sodium as water is lost. Rare causes of pseudohypernatraemia include: hypoproteinaemia or hypolipidaemia due to indirect ion selective electrodes, and sodium citrate contamination, which is the focus of this article.

As mentioned, a rare cause of spurious hypernatraemia (psudohypernatraemia) is sodium citrate contamination. Sodium citrate is a preservative solution in blood tubes used for coagulation

testing. An alternative source of such contamination is the use of Tri-sodium citrate (Citra-lock) used to lock central venous catheters to maintain patency of catheters between dialysis.

Citra-lock has broad spectrum antimicrobial and anti-yeast properties that make it effective at reducing infections. This solution has a high concentration of sodium (tri-sodium 420 mmol sodium/L) therefore, any contamination will spuriously elevate sodium levels. Unlike EDTA contamination, that is frequently encountered in the biochemistry laboratory due to incorrect order of blood draw, sodium citrate does not contaminate samples in the same way. Such contamination is due to either direct pouring into a biochemistry sample, or inappropriate sampling of sodium citrate.

If pseudohypernatraemia is suspected additional investigations will help identify the true cause of sodium elevation. For example, sodium citrate is a weak chelator. This will spuriously elevate sodium whilst lowering calcium, magnesium, iron and alkaline phosphatase. However, because of its weak chelator properties, mild contamination can appear equivocal. Instead measurement of chloride and measured osmolality by freezing point depression can accurately determine sodium citrate contamination. Physiologically, serum chloride and sodium elevate and decrease together with a 1:1 ratio in the extracellular fluid. However, when a sample has been contaminated with sodium citrate serum chloride levels are uncharacteristically low (<90 mmol/L). The decrease in chloride is due to a dilution effect of the preservative as well as due to the anion: cation dissociation of sodium chloride. In this instance the contamination produces a negative osmolar gap (calculated osmolarity less than measured osmolality) that is not associated with any clinical condition and is useful when determining sodium citrate contamination.

Clinical case

A recent biochemical profile on a 62-year-old female in primary care originally displayed severe hypernatraemia with ionic concentrations greater than 160 mmol/L (167 mmol/L). Confirmation of the result with repeat testing excluded ion selective electrode performance issues as the cause of hypernatraemia. Further investigation of recent electrolyte results identified that the patient had normal electrolyte levels, and there was no clinical condition found that could explain elevated sodium levels. Therefore, additional testing was carried out to eliminate sodium citrate contamination before technical authorisation. Additional tests included: serum calcium, chloride, and measured osmolality. The results of the tests identified that the sample had been contaminated with sodium citrate, with a chloride result of 92 mmol/L, a total calcium level of 1.96 mmol/L and a measured osmolality of 291 mOsm/L.

When referencing recent history of results calcium and chloride levels were inappropriately low, with chloride unusually low compared to serum sodium (only seen in metabolic acidosis), and as this is a primary care patient with no clinical details referencing acid-base disorders the results appeared spurious. The patient also had a negative osmolar gap (-52) as the measured result was 291 and calculated 343. Therefore, the results were excluded due to sodium citrate contamination and repeat bloods were sent.

In addition to the clinical case study discussed, sodium citrate can have an impact on common assays used to determine such contamination. Patient pooled serum (1ml) was spiked with increasing volumes of sodium citrate to display how the solution affects different assays. Sodium levels gradually rise with increasing volume of sodium citrate because additional sodium is being introduced into the sample, as such the calculated osmolarity will also elevate. Calcium and chloride levels decrease gradually with increased volume of spiked sodium citrate, with chloride levels lowering due to a dilutionary effect and the dissociation ratio of sodium chloride. And calcium lowers because sodium citrate is a weak chelator, where citrate forms calcium citrate complexes disrupting the blood clotting mechanism.

To conclude, unrecognised pseudohypernatraemia due to sodium citrate contamination can lead to inappropriate hospital attendance and investigation, as well as misdiagnosis and unnecessary treatment. Therefore, biomedical scientists need to be aware of any suspected cases when the results do not match previous history, the clinical details are not indicative of hypernatraemia and there are no medications associated with hypernatraemia. In suspected cases of pseudohypernatraemia, biomedical scientists can perform investigations that will help to determine whether the raised sodium is a spurious result, or the patient has true hypernatraemia. As previously highlighted, calcium and chloride levels should be uncharacteristically low. The osmotic gap will be negative, with the calculated osmolality higher than the measured osmolarity, which is not seen in any pathological conditions. Performing these technical checks will ensure accurate and reliable reporting of hypernatraemic patients, and will ensure that the laboratory is accurately determining any suspected cases of pseudohypernatraemia due to sodium citrate contamination. BMS

Dan Kelly is Biochemistry Lead and Deputy Manager at Spire Hospital Leeds

TOP FIVE... CONGRESS PICKS

With **IBMS Congress 2019** just a few months away and the speakers now confirmed, we ask some of the scientific programme leads which sessions they are looking forward to most and why.

01

Chris Elliott

Lead Scientist, transfusion

TOP PICK: The role of the advanced therapies unit in the generation of advance therapy medicinal products
SPEAKER: Dr Laurence Pearce

WHY: Currently, this work occurs in a few specialist centres across the country. However, I believe that in the future this type of therapy will expand and although the cell manipulations may stay within select labs many other labs will have to handle the finished product and ensure safe distribution to patients.

The skill set for this is similar to the existing ones in transfusion, but it is vital that lab scientists involved have a firm understanding of the science of this therapy as they currently do with blood component therapy.

02

Alex Javed

Service Manager - Laboratories

TOP PICK: One-step nucleic acid amplification for breast SLN
SPEAKER: Leah Tauira

WHY: I am looking forward to the whole of the Tuesday morning session, which features case studies across a wide range of specialist areas (these include one-step nucleic acid amplification, Mohs' surgery, Wilms' tumour, for example).

It provides an opportunity for speakers to highlight these areas and for the attendees to gain an insight into the clinical complexities of the conditions and the techniques used to support diagnosis, thereby widening awareness of the critical role of the cellular pathology laboratory in improving patient outcomes.

03

Sheri Scott

Senior Lecturer in Biomedical Science

TOP PICK: Interferences in immunoassay
SPEAKER: Dr Karen Smith

WHY: The programme is pretty great this year, with a wide range of topics across all days, so I find it difficult to pick specific sessions of interest.

If any, I think my go-to would be the "Interferences in immunoassay" session on Monday. This is very topical at the moment and should appeal to all grades of biomedical scientists.

I would also like to draw attention to the clinical case sessions running on Tuesday. Our programme aims to provide both basics and more advanced clinical biochemistry to support learning across the full range of IBMS qualifications.

04

Kirstie Rice

Consultant Biomedical Scientist

TOP PICK: HPV implementation – international perspective
SPEAKER: Jesper Bonde

WHY: I'm very much looking forward to hearing about HPV primary screening implementation from outside the NHSCSP from our European speaker Jesper Bonde, particularly as this follows on from the earlier sessions on the Monday looking at the UK perspective.

On a personal development perspective (and being part way through this process myself) I'm also very interested in hearing about Gary Player's experiences undertaking the ASD Gynae Histology reporting qualification on the Tuesday.

05

Sally Cutler

Professor in Medical Microbiology

TOP PICK: Animal diagnosticians – what can we learn
SPEAKER: Dr Nicola Rooney

WHY: Parallel sessions are often challenging, but to select a favourite from the 2019 Congress is a really tough call. As a microbiologist, I am probably bias, but see myself running between sessions.

One dilemma will be to choose between "The last days of smallpox, tragedy in Birmingham" and "Animal diagnosticians – what can we learn", both at 16.30 on Tuesday. The final session for transfusion science looks really exciting, covering blood supply in Africa, through to blood buses and drones, but then that clashes with "Monkey pox in the UK"...

WHAT HAVE THE ROMANS EVER DONE FOR US?

Apart from the sanitation, the medicine, education, wine, public order, irrigation, roads, the fresh-water system, and public health, what have the Romans ever done for us? **Stephen Mortlock** investigates.

The mighty Roman war machine ground relentlessly across Europe and Africa. Carthage, Greece, Germania and Gaul had fallen and the Roman influence extended from the Channel coast to the Caucasus, from the northern Rhineland to the Sahara. Over the Channel was another prize: Britannia.

But why invade Britain at all? It was not about economics. Rome was already rich, goods and products like cereals, olives, fruit, hides and, unfortunately, slaves from their conquered lands, were being sent to Rome, and private estates in North Africa were some of the largest exporters of grain in the Empire.

Nor was it about military security – the Channel was an effective deterrent. The invasion of Britain was a war of prestige. The emperor Caligula had been assassinated in 41 AD, and an obscure member of the imperial family, Claudius, (full name: Tiberius Claudius Caesar Augustus Germanicus) had been elevated to the throne. The new emperor was the first to be born outside Italy and he

IMAGES: ALAMY

suffered from a limp and slight deafness acquired during infancy (possibly infantile polio). Because of this, he faced opposition from the Senate and he needed a quick political fix to secure his position. What better than a glorious military victory in Britain?

Since Julius Caesar's withdrawal from Britain in 54 BC the country had remained free – mysterious, dangerous and exotic. In the popular Roman imagination, it was a place of marsh and forest, mist and drizzle, inhabited by ferocious blue-painted warriors. Here was a fine testing-ground of an emperor's fitness to rule.

Contemporary records suggest that in 43 AD Aulus Plautius sailed from Boulogne to Richborough (Kent) with four Roman legions and an equivalent number of auxiliaries (about 40,000 men in total). British resistance was led by Togodumnus and Caratacus, sons of the late king Cunobeline (of the Catuvellauni tribe, from the Hertfordshire, Bedfordshire and southern Cambridgeshire area).

A substantial British force met the Romans at a river crossing thought to be near Rochester on the River Medway. The battle raged for two days, but eventually the British were pushed back to the Thames. Togodumnus died shortly after this battle but his brother escaped and would continue the resistance further west. Meanwhile, a second force under the Emperor Claudius had also arrived in Britannia, possibly near Chichester or Portsmouth, and he brought with him a war elephant which according to Polyaenus "caused the Britons and their horses to flee", allowing the Roman army to march on unopposed.

Plautius halted his advance and sent word for Claudius to join him for the final push towards Colchester (Camulodunum), allowing the emperor to appear as the conqueror (a sound political move). Cassius Dio relates that 11 tribes of South East Britain surrendered to Claudius and his armies prepared to move further west and north. The Romans established their new capital at Colchester and Claudius returned to Rome to celebrate his victory.

When the army moved forward to conquer new territory, the politicians and civil servants took over in the subdued areas. The Iron Age tribal centres were redesigned to become Roman towns, they built regular street-grids, forums (market squares), basilicas (assembly rooms), temples, theatres, bathhouses, amphitheatres, shopping malls and hotels. The towns were very Roman but, interestingly, the people in charge were not. Instead of an influx of foreign overlords stirring up resentment, the councils were formed of local warlords and they were responsible for tax-collection and keeping order in the surrounding countryside, effectively running things on Rome's behalf. Elevating the role of the conquered people was highly successful and in the space of a generation or two, the citizens converted themselves from Celtic warriors and druids into Romanised gentlemen. Britain's upper classes had found a new style. Blue paint and chariots were so last century, while Gaulish wine and the Greek myths had become sophisticated; you now had to project rank and status in the "Empire" fashion. In gratitude for having their power and property preserved, the local gentry proved loyal servants to the Empire.

The Romans had three different types of baths: baths at home, private baths and public baths run by the state

Public health

The Romans valued the same preventive approaches to health endorsed by Greek culture and medicine: proper exercise, diet, and spa-type public baths, with some aspects of divine respect and tribute included. Roman public officials had recognised that as towns enlarged into cities with large populations and trading centres, the need for good hygiene increased. Public granaries were strictly regulated for cleanliness; public latrines and plumbed sanitation to control sewage were established in many Roman areas; and a good, clean, reliable water source was a prime directive of public works in Roman cities. Certainly, piped water supplied many public fountains, which were the main source of water for poorer households.

Vitruvius wrote of the importance of such a water supply, and the aqueducts built for this reason still function today in some areas. In Roman Britain, large aqueducts were generally not needed, as water could be found close to most places in rivers or wells. Although in Dorchester there is a an aqueduct that is still largely intact which measures eight miles long, by 5ft wide and 3ft deep, capable of delivering two million gallons of water a day.

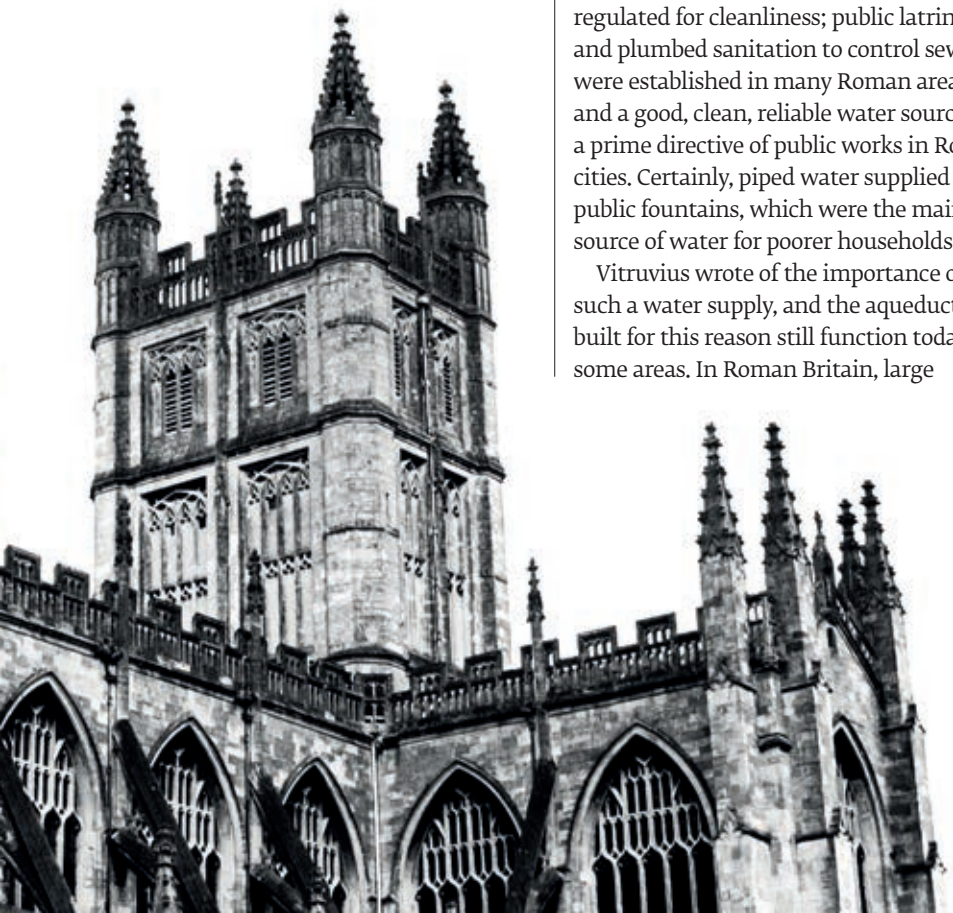
The Roman legions, far away from their homeland, built their own baths at mineral and thermal springs in the newly conquered lands. In many of the forts along Hadrian's Wall it is possible to find archaeological evidence of baths, drainage ditches and water storage facilities. The Romans had three different types of baths: baths at home, private baths, and public baths that were run by the state.

Some of the public baths later developed into huge and impressive edifices (thermae) with a capacity for thousands of people. In the heyday of Roman bathing culture, the inhabitants of Rome used 1,400 litres of water per person per day, mainly for bathing.

In Britain one of the best examples of the public baths can still be found in Bath, where the Roman's built a formal temple complex around the spring. This spring is a natural mineral spring and is the only spring in Britain officially designated as "hot".

Medical knowledge

By the first century AD, the Roman Empire had effectively assimilated the knowledge and skills of the Greek world and in the process they borrowed their medicine and caring practices. The ideas of the philosophers, such as Hippocrates and Aristotle, were taken on board, as were certain religious beliefs, certainly the Cult of Asclepius continued to be popular. But Roman medicine was really



West Asian and African medicine because most of the great doctors of the Roman Empire lived in West Asia (in Turkey and Syria), or in Africa (in Egypt), not in Europe. These doctors referenced earlier Egyptian, Indian, and Greek medical research. Roman doctors like Scribonius Largus relied heavily upon the Greeks' discoveries and practices who firmly believed in achieving the right balance of the four humors and restoring the "natural heat" of people with medical conditions. One of the most important Roman doctors was Aelius Galenus (Galen), who started his medical career by treating local peasants and performing surgery on a gladiatorial troupe while living in Pergamom (in modern Turkey), he then continued his studies in Smyrna, Corinth, and Alexandria.

In 162 AD the ambitious Galen moved to Rome where he quickly rose in the medical profession owing to his successes with rich and influential patients whom other doctors had pronounced incurable, his enormous learning, and the rhetorical skills he displayed in public debates.

He believed the theory that opposites would often cure people. For a cold, he would give the person hot pepper. If they had a fever, he advised doctors to use cucumber. In general Roman physicians were self-taught with no formal training requirements and tended to be in private practice as itinerant physicians, unfortunately this was also reflected in the low cure rates. Civic doctors in the paid service of local communities did not appear in Rome until the 4th century AD.

Throughout history, some of the biggest advances in medical practice have come during war time and Roman medicine similarly had its foundations in the innovations and discoveries on the battlefield. The Roman Empire was built upon the success of its legions and Emperor Augustus implemented a number of reforms as he identified the importance of health to cut down losses and to raise troop morale during long military campaigns. Archaeologists found the ruins of a Roman military camp in Baden (Germany) and they showed evidence of a hospital or valetudinarium, these would be more accurately be described as a "mobile military camp".

He believed the theory that opposites would often cure people. For a cold, he would give the person hot pepper. If they had a fever, he advised doctors to use cucumber

A field-surveying text De Munitionibus Castrorum described one of first hospitals: "Usually arranged to accommodate two hundred men... hastily constructed and was not elaborately equipped." The valetudinarian soon developed from a group of tents to well-equipped military hospitals built of stone and wood. Remains found in Baden suggest that the hospital had: "An imposing façade, a colonnaded portico, and traces of walls outlining as many as fourteen rooms. The larger may have been subdivided into smaller compartments for fragments of wooden partitions have been found." The first priority for these hospitals was sanitation. Location of the building with access to clean water and adequate sewerage was planned to the finest detail. Military practicality had done away with the superstition of civilian medicine. There was an understanding about the causes of infection, as there were isolation rooms with running water, obtaining this water from sources upstream of the latrines. Where and where not to build became just as important as what to build. Marcus Terentius Varro (116BC–27BC) a Roman scholar and writer, was able to recognise the importance of micro-organisms in the pathogenesis of disease long before Louis Pasteur formalised the germ theory of disease. "Special care should be taken to place it at the foot of a wooded hill where it is exposed to health-giving winds. Care should be taken where there are swamps in the neighbourhood, because certain tiny creatures which cannot be seen by the eyes breed there. These float through the air and enter the body by the mouth and nose and cause serious disease."

Caches of surgical instruments have also been uncovered including arrow extractors, catheters, scalpels, and forceps. Inscriptions for the medical professionals stationed there often bore the titles *medicus ordinaries, medicus legionis* and *medicus cohortis*: the term "*medicus*" referred to their position as milites medici – soldiers who were exempt from other duties. The title following the word *medicus* referred to their rank within the medical corps – for example the *medicus legionis* would be the "medic" in charge of a legion while a *medicus cohortis* would be responsible for a cohort (10 cohorts in a legion). The Roman doctors had procedures to sterilise their equipment in boiling water before using it and performed minor operations using opium and scopolamine to relieve pain and acid vinegar to clean up wounds. They did not have effective anesthetics for complicated surgical procedures, but it is unlikely that they operated deep inside the body.

IMAGES: ISTOCK/SHUTTERSTOCK

Herbal remedies

As a supplement to medical interventions the Romans also employed herbal remedies based on the *De Materia Medica* written by the Greek physician Dioscorides who practiced in Rome when Nero was the ruler. Wine was a frequent component of ancient Roman medicine as it is a good means of extracting the active elements from medicinal plants. The sweet Roman drink "mulsum", a mixture of wine and honey, was served as pre-dinner drinks at Roman parties. But, the recipes include precise quantities for the ingredients, suggesting that it was also developed for medicinal purposes.

Another staple for the medicine cabinet was garlic, Galen believed it to be the cure-all herb with antibacterial, antiviral, anti-parasitic and antifungal properties. The Romans took barley (*hordeum vulgare*) with them across Europe and the Middle East, establishing it everywhere they went as a staple food and an ingredient for brewing beer but also a medicine. One of its most popular medicinal uses was as an anti-inflammatory, a property for which barley still has a sound reputation today, being widely recommended as a treatment for osteoarthritis, gastric ulcers and other inflammatory diseases. Made into a poultice and applied externally, barley has demulcent properties which make it helpful in soothing and reducing inflammation in sores and swellings. A hot poultice eases stiff and painful joints and draws the poison from boils, abscesses, stings, bites and infected cuts.

A cold poultice relieves swellings and helps with weeping eczema and other itchy skin conditions.

Who would believe that cabbage would be useful for treating wounds and sores and a hangover remedy, the Romans simply ate cabbage to ward off hangover effects. They ate it raw and served it with vinegar and lots of olive oil, sometimes boiling it. Cumin was often added too, for flavour but also for additional healing properties. Most importantly, they ate it before banquets and celebrations to prevent drunkenness. Aristotle himself practiced eating cabbage before and after alcohol intake. Nervous disorders were treated with Fennel (*foeniculum vulgare*), because Romans believed that it calmed the nerves. Historians believe an extinct plant of the genus Ferula (a variety of giant fennel) Silphium, could be used for fever, cough, indigestion, a sore throat, aches and pains, and warts. Hippocrates wrote: "When the gut protrudes and will not remain in its place, scrape the finest and most compact silphium into small pieces and apply as a cataplasm." People may have used extracts as a form of contraceptive. In *The Illiad*, Achilles treats the wounds of his friend with yarrow (*achillea millefolium*), this well-read story would have ensured this treatment was common knowledge in the Roman world. Modern research shows that yarrow is an astringent, is anti-inflammatory and promotes healing. Elecampane (*inula helenium*), also known as horseheal, is a member of the sunflower family and, according to Pliny (23-79 AD), could be used as a condiment, for digestive problems, an expectorant and for water retention.

The Romans applied unwashed wool to sores. Wool contains lanolin which has both anti-fungal and anti-bacterial properties that protect the sheep's skin from infection. It seems that Romans were also very particular about their looks, Graeco-Roman medical textbooks report several peeling applications, such as cleansing, brightening, darkening, softening and aesthetical improvement of the skin by use of peeling and chemical peeling, as well as therapy of dermatological diseases.

Conclusions

The decline of Roman influence in Britain is generally believed to have started with the revolt of Magnus Maximus against emperor Gratian in 383 AD, while in Britain General Flavius Stilicho was suffering raids by the Scoti, the Saxons, and Picts. These were followed by wars in Europe against the Visigoths and the Ostrogoths. Needing extra military manpower, Stilicho deployed men from Hadrian's Wall and shipped most of the remaining troops from Britain to fight in these wars. Finally, in 409 AD, the Britons expelled Roman authority from the country, although the repercussions lasted much longer. The historian Theodor Mommsen believed that because the Roman needs and priorities lay elsewhere in Gaul and Italy: "It was not Britain that gave up Rome, but Rome that gave up Britain...!" But they left a rich legacy behind them with their aqueducts, public baths and sewage systems and the start of an excellent medical service. Although the hospitals were initially established for military purposes, they eventually developed civic hospitals for the general public. The Empire's gradual demise in the Christian era lowered the curtain on original medical endeavour as Europe entered the dark ages. BMS

HINTS AND TIPS FOR INTERVIEWS

Inspired by a popular online #IBMSchat about applying for a band 6 position, **Jo Horne** wrote the following article.

Preparing for an interview can be challenging, especially if you haven't attended one for a while. Have you ever wished that you could have some hints and tips for success from those more experienced?

General hints and tips

Regardless of what position you have applied for, there are some general points to remember when preparing. Most importantly, read the job description and person specification, as these will give you additional clues as to what will be expected of you in the role. Does the post include management or supervision? If so, think about examples of how you have coped under pressure, worked with a difficult colleague, or managed conflict.

Does the post include a quality role? If so, ensure that you have extensive knowledge of ISO 15189 and any quality management systems used in the department. If the post is in a different trust, find out what their current UKAS status is. If they are not accredited, think of examples to describe how you can contribute to achieving accreditation. If they are accredited, think of examples of how you can maintain the current standards as part of the team.

Many trusts also include "values-based recruiting". It is

important to know what the trust values are, as you may be asked what they are, how you meet them, and how they translate to your role.

Back to basics

It's easy to focus down on the specifics of the post you are applying for – but don't forget about the basics. The panel may use a points-based system and so it is important to describe the basics that any laboratory professional should know. Make sure you are familiar with quality management and document control, internal and external quality assessment schemes, health and safety, risk management and IT systems. Questions may relate to knowledge of UKAS, its place in the laboratory and your involvement, and how to encourage compliance with use of the quality management system. You could also be asked about external or internal quality assurance schemes relating to your specialty, or key performance indicators.

You should also be aware of issues and bodies relating to specific disciplines and roles, for example, the Medicines and Healthcare products Regulatory Agency, Serious Hazards of Transfusion, or Human Tissue Authority.

It is important to come across as passionate, with appropriate levels of confidence. But equally, be considered and don't rush in. If you don't know, say so, but offer an educated answer (with the caveat that you'd check). Show the panel that you would be a safe pair of hands, with the patient at the centre of everything you do.

Different examples

It is important to go into the interview with prepared examples, but ensure that you have a few in mind, so that you can give a different examples. Under pressure many people use the same example, which can be frustrating for interviewers. A good way to prepare examples is by using "CAR stories". CAR stands for "context", "action" and "result", and is essentially a short story based around the following: What was the context? What was your action? What was the result?

Be aware that you may be asked to do a written or practical activity relating to your role, such as a film test on the microscope in haematology. In case of a written activity, take a pen with you – as it may feel better to be prepared with your own stationery.

CPD is core

CPD and reflection is a core part of our practice as biomedical scientists. It is commonplace for interviewers to ask about recent examples of CPD, so always have some ready. Think about the last piece of CPD you did, why you did it, and how it changed your practice. Have you done a piece of CPD that has resonated with you? Why? Interviewers want to know that you are developing professionally and are passionate about what you do. Other reflective questions include giving an example of a mistake or disappointment, and how you overcame it. When giving examples, try to put patients at the centre of your answer. The panel may wish to know about your professional development, so be ready to describe your career to date, with key highlights that demonstrate the strengths and qualities that you can bring to the role.

"Show the panel that you would be a safe pair of hands, with the patient at the centre of everything"

Banding questions

Sometimes you may be asked questions relating to the banding. It is important to have a firm idea in your head of what the difference is between your current band and the band you are applying for. A band 6 job is more likely to involve supervision, management and training, and the panel will look for examples from your experience as a band 5 to see whether you have the skills to act at a more senior level. For example, you may be asked to give an example of how you have dealt with a difficult member of staff or an episode of conflict. Another common question, to show that you can cope under pressure, is to ask what you would do if an essential piece of equipment within your section failed. Many of us have experienced this, so think back to what you or your team did – would you do the same again? What would you do differently next time? For a training role, you might be asked about examples of previous supervision and training, or perhaps what you think makes a good trainer.

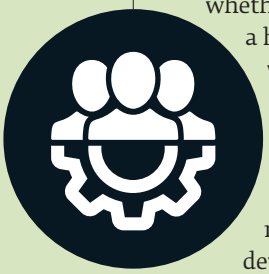
A band 6 or 7 post is more likely to involve working within a specialised area, and so you may be asked more specialised scientific/technical questions, as opposed to general questions – so know your theory. When applying for more senior roles, it is

WHAT IS #IBMSCHAT?

#IBMSchat is a twitter discussion on the first Wednesday of every month, between 8pm and 9pm, with various themes and hosts – why not join in next time? **@CDBeckett @IBMScience**.

important to be aware of your expectations, but also your limitations. The panel are not expecting you to know everything when you start in a role – but they want to see that you have initiative and the ability to develop yourself personally and professionally.

At a senior level you are likely to be asked about harmonisation, and working with others as part of a team. Remember to use examples of your previous experience, and to always put the patient at the heart of your answer.



Think about the changes that are happening in pathology. Know about NHS Improvement Networks, and whether the trust is to be a hub or spoke. How will this affect the running of the department, and how will you contribute to maintaining and developing the service so it is fit for the future? What changes would you suggest within the department and how might you go about implementing them?

Be aware of strategic documents from NHS England and other stakeholder organisations, e.g. "Five Year Forward View". How will it effect pathology and your specialty? What are the opportunities for service improvement and innovation? It may also be useful to have some knowledge of finance and cost improvement programmes, and the strategic plan of the organisation.

With all of these hints and tips in mind, the most important thing to do is to remain calm. Remember that the panel are interviewing you because your application was good and you have earned your opportunity. Now you just need to go and grab it! BMS

Jo Horne is an Advanced Practitioner Healthcare Scientist in Cellular Pathology at Southampton General Hospital

SAMPLE JOURNEY POSTER COMPETITION

This month's **#IBMSCompetition** is about putting up an IBMS sample journey **#PosterInYourGPs**

For April's IBMS Competition (see box, right) we're asking you to put a poster up at your local GP surgery and then take a picture and send it to us. A lot of patients are not aware or simply do not think about the fact that their samples are sent to hospital laboratories where skills and expertise are used to analyse them and produce detailed reports. This is why we have created three animated sample journey videos and put them online at www.samplejourney.com. The posters included with this month's issue highlight some of the characters and facts from the videos and ask people to visit the website to watch them.

The videos present the stories of three patients whose tissue, urine and blood samples are analysed by biomedical scientists in histopathology, microbiology and biochemistry laboratories. All three of the videos focus on the skills involved in the processing of samples and how the work of biomedical scientists affects patient outcomes.

If you haven't seen our sample journey animations yet, be sure to head over to www.samplejourney.com and watch how Ian's urine, Michelle's blood and Mohammed's tissue sample are processed by Cherie, Danny and Jo. These short minute-and-a-half animations have been made with the general public in mind – informing them about the skills involved in the biomedical science at the heart of their healthcare.

With an estimated 150 million samples processed every year in the UK – it's time everybody knew more about the biomedical science workforce. Your pictures will be posted in our Facebook gallery and the one with the most likes on Tuesday 30th April will be the winner.

If anybody wants more sample journey posters (or the leaflets we have produced to go alongside them) please contact us at: **communications@ibms.org** We can't wait to see your sample journey posters in GP surgeries across the land! IBMS

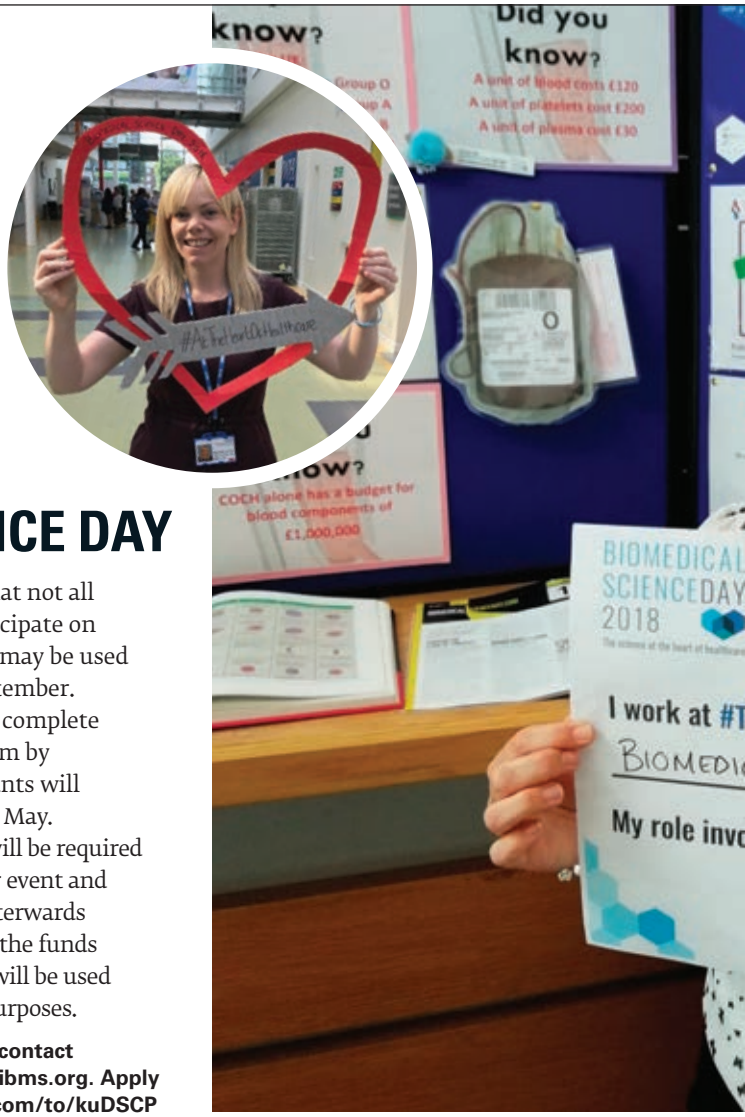
#IBMSCOMPETITION

Every month, the IBMS communications team run the IBMS Competition through their social media channels – prompting members to share their pictures and promote the profession. Winners usually receive "I love biomedical science" goody boxes, but this month there will a few special extra prizes for people going the extra mile.

COMPETITION RULES

- ✔ Before you put your poster up, please ask for permission at the reception desk, show them the poster and say that you are a member of the Institute of Biomedical Science and that you want to help inform patients about the science behind their healthcare.
- ✔ Before you take a picture of yourself and the poster (or just the poster), please make sure you are allowed to do so and try not to get any unwilling members of the public in your shot.
- ✔ Post your pictures online using the **#IBMSCompetition** and **#PosterInYourGPs** hashtags on Twitter, put it in the comments of the pinned competition thread on our Facebook page, or email **communications@ibms.org**
- ✔ The competition closes on **Friday 26th April 2019**

MY IBMS NEWS



ACTIVITIES AND EVENTS

GRANTS FOR BIOMEDICAL SCIENCE DAY

The IBMS is offering grants of up to £500 for members to organise events for Biomedical Science Day.

The funds, from the Albert Norman Trust Fund, are for the development of biomedical science-related activities and events.

Activities should aim to raise public awareness of biomedical science and demonstrate the value of the profession and its role in prevention, diagnosis and treatment of infections and disease.

The grants may be used to support a range of activities, including buying equipment and resources for experiments, exhibition space at careers events, marketing and incentives and giveaways.

The IBMS recognises that not all members are able to participate on the day, therefore, grants may be used for activities up to 30 September.

Those applying need to complete the online application form by 17 May. Successful applicants will be notified by email by 24 May.

Those awarded grants will be required to provide pictures of their event and write up their activities afterwards to demonstrate how the funds were used, which will be used for promotional purposes.

→ For information contact communications@ibms.org. Apply at: ibms1.typeform.com/to/kuDSCP

OBITUARY

Bill Swainston

It is with regret that we announce the passing of Bill Swainston, former Senior Biomedical scientist at Bradford Royal Infirmary. Bill passed away on 26 October 2018, following a long battle with illness.

Bill started his career at the Bradford Royal Infirmary in 1964 as a Junior Medical Laboratory Technician, rotating through all the areas of pathology before starting in haematology upon his state registration.

He spend the rest of his 42-year career in the haematology laboratory at the Royal, rising to be a Senior Chief Biomedical Scientist and Site Coordinator. His mentoring skills played an important role in many peoples' careers, as they moved away from Bradford to leadership roles all over the country and abroad.

Bill leaves behind his wife Jean and three daughters, Stephanie, Angie and Stella. Our thoughts go out to them at this difficult time.

CORRECTION

LETTER TO THE EDITOR

I am writing about an item in "Science News in Numbers" (page 7 of the March *Biomedical Scientist*).

The final item on the page reports an 8% higher chance of death with regular fried food consumption and a 12% increase in the probability of death in those who regularly ate fried chicken.

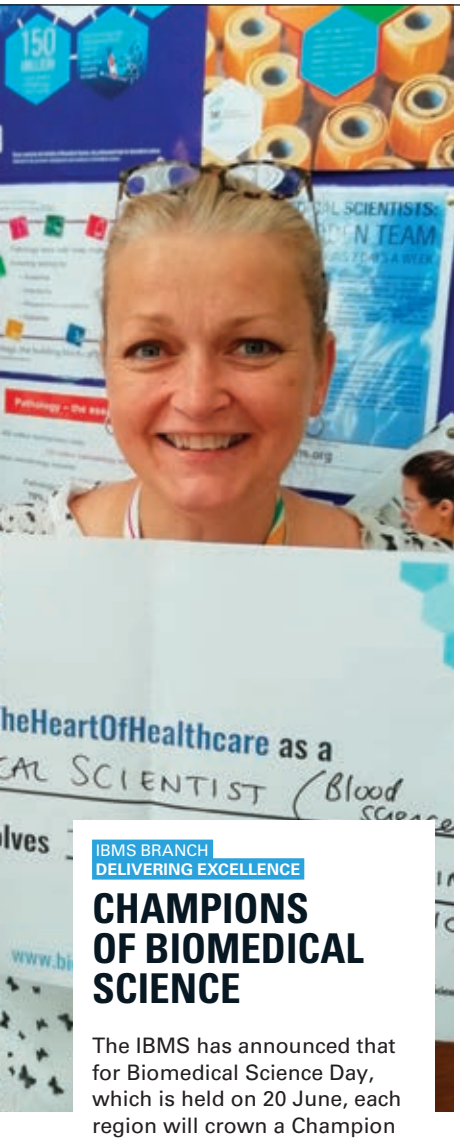
I find this amazing in two ways. I have been a medical laboratory scientist and member of the Institute for well over 50 years and have always believed that the probability of death was 1 (ie 100%). Everybody would die with no possibility of death being preventable. In order to find something that increases the probability of death indicates that somehow somewhere someone has found a way to eliminate death and reduce the probability of death to less than 100%. I find this amazing. I still regularly read *The Biomedical Scientist* and yet managed to miss any report on the world shattering news of something bringing about immortality.

The second amazing thing is that they have managed to identify, prove and confirm the immortality. I would have expected that it would literally take forever to verify true immortality.

Apart from missing the immortality claim, I still enjoy reading *The Biomedical Scientist* (despite having retired in 2005).

So congratulations and keep up the good work.

Best wishes
John
DJ Cook FIBMS



IBMS BRANCH
DELIVERING EXCELLENCE

CHAMPIONS OF BIOMEDICAL SCIENCE

The IBMS has announced that for Biomedical Science Day, which is held on 20 June, each region will crown a Champion of Biomedical Science.

The champions will be IBMS members who in the past year have shown dedication to the promotion, development and delivery of excellence in biomedical science.

Examples of expected nominations include members who are verifiers or examiners, training officers or lab managers, and those involved in public engagement activities or making any other kind of contribution to the profession.

Nominations can be made via the online application as a written statement and must include how the nominee has championed dedication to the promotion, development and delivery of excellence in biomedical science.

All nominations must be submitted by 13 May.

→ **For more information, visit the IBMS website.**

VOTE FOR YOUR COUNCIL

The IBMS Council is the Institute's governing body and comprises six National and 12 Regional members. It is elected by members to make key decisions, develop policy and strategy, and ensure the organisation achieves its aims and objectives on behalf of IBMS members. Council members will play a central role in shaping the Institute's future and ensuring that the professional body is run effectively and that it meets members' needs.
The following completed nominations were received by the due date to fill the vacancies on Council in 2019.

REGIONAL MEMBERS - FIVE VACANCIES

Irish Region	Mrs Shauna McAuley
Scotland	Dr Linda Walsh
South West	Mr Andrew Usher
Yorkshire	Mrs Joanna Andrew

No ballot will be required for the Irish Region, Scotland, South West, and Yorkshire vacancies on Council in 2019.

West Midlands	Mr Nigel Coles
	Dr Shivanthi Samarasinghe

Elections for the West Midlands vacancy will be required.

NATIONAL MEMBERS - TWO VACANCIES

Dr Selwa Alsam
Dr Victoria Bradley
Dr Mike Carter
Dr Jo Horne
Mr Charlie Houston
Professor Keith Hyde
Ms Marilena Ioannou
Mrs Sandra Phinbow
Elections for the National vacancies will be required.

ELECTIONS – HOW TO VOTE

Corporate members who have previously registered an email address with the Institute will receive an email containing their secure link to the voting site on Wednesday 24th April 2019.
Corporate Members who have not registered their email address with the Institute may register to receive their voting details by email or request a postal vote using one of the following methods. Your full name and IBMS membership number will be required.

By email: support@mi-voice.com
By phone: 023 8076 3987 (this service will be staffed from Monday to Friday, 9.00am – 5.30pm excluding Public Holidays and a voicemail service is available at other times)
By internet: www.ibmsballotrequest.org

Voting will close at 5.00pm on Thursday 23rd May 2019, and the result of the election will be officially confirmed at the Annual General Meeting, to be held on Saturday 8th June 2019 in London.

ALL ELIGIBLE MEMBERS ARE ENCOURAGED TO VOTE

CONGRESS

Book now for early bird

More content is being added to our biggest Congress ever, so check the Congress website at **congress.ibms.org** to see the latest additions to the programme. The early booking discount runs until 30 June, so there is still time to book your places and take advantage of the savings.

IBMS RESOURCES

THE JOURNEY OF A SAMPLE

For Healthcare Science Week, which ran from 8 to 17 March, the IBMS made three videos that detail what happens to samples given at GP surgeries.

A lot of patients are not aware that their samples are sent to hospital laboratories where skills and expertise are used to analyse them and produce detailed reports.

So the Institute created three animated sample journey videos, which can be accessed at samplejourney.com.

The short minute-and-a-half videos present the stories of three patients whose tissue, urine and blood samples are analysed by biomedical scientists in histopathology, microbiology and biochemistry laboratories.

All three animations focus on the skills involved in the processing of samples and how the work of biomedical scientists affects patient outcomes.

→ **The IBMS is running a related poster competition, details of which are published on page 39. For more information and to request extra posters and leaflets, email communications@ibms.org**

OBITUARY

David James Rogers (1940–2019)

The Institute has received notification recently of the death on 17 January of Professor David Rogers, aged 78.

David commenced laboratory work as an MLSO in 1957, at the Central Public Health Laboratory Colindale, principally in the Standards Laboratory for Serological Reagents, where in 1962 he achieved Institute Associateship in Bacteriology. His career then took him to North Devon, where between 1963 and 1970 David occupied Senior I (Microbiology and Serology), Senior II (Blood Serology and Transfusion) and Chief MLSO (laboratory manager) posts.

During his time in Devon, in 1965, David achieved Institute Fellowship after success in the Final Examination in Haematology.

A change in career beckoned in 1970 when David moved to Portsmouth to take up a position as Lecturer II in the School of Pharmacy at Portsmouth Polytechnic. Senior Lecturer (1975) and Principal Lecturer (1985) posts followed over the subsequent two decades, after which, in 1990, he was appointed Reader in Biomedical Science. Two years later, when Portsmouth Polytechnic was granted university status, David was awarded a personal chair. The significance of this cannot be underestimated as David was the first member of the Institute to achieve such a prestigious full-time position in a UK college.

A pioneering and hugely influential figure in the development of biomedical sciences education and research, David, along with his colleague Ray Jones, developed at Portsmouth the first degree programme in Biomedical Sciences in the UK. He was also a member of the assessment panel for biomedical sciences and other subjects allied to medicine in two successive Research Assessment Exercises.

David was a major figure in the Heads of University Centres of Biomedical Sciences, which represents the interests of member institutions at a national and international level. He served as its third President (1997–2000) and later took on the role of Hon Executive Secretary in the mid-2000s. Subsequently, he was elected President Emeritus by acclamation.

He chaired the Quality Assurance Agency's Benchmark Statement for Biomedical Sciences and was a source of wise counsel for the Institute on education matters, and also served as Chief Examiner in Immunology.

David was Deputy Editor of *Medical Laboratory Sciences* (subsequently the *British Journal of Biomedical Science*), and took over as Editor-in-Chief on the death of Dr AD Farr. David passed the editorial mantle on to Brian Nation at the end of 1997, having been appointed Dean of Science at Portsmouth.

While David's curriculum vitae fails to conform to popular belief that a single side of A4 paper is adequate, its numerous pages are required to reflect the achievements of a laboratory and academic career that focused on nurturing the talents of those who have gone on to make the biomedical science profession and service a part of healthcare of which to be proud. The one omission from his CV is David's love of, and talent for, playing the double bass.

David was an esteemed colleague hugely respected and admired by his peers across the entire biomedical sciences community. He is survived by his wife, Margaret, son, Adam, and daughters, Sara and Samantha, to whom we offer sincere condolences.

JOURNAL-BASED LEARNING EXERCISES

Please select your choice of correct answers and complete the exercises online at: **www.ibms.org/cpd/jbl**

DEADLINE WEDNESDAY 3 JULY 2019

Association of genetic polymorphisms of chemokines and their receptors with clearance or persistence of hepatitis C virus infection

El-Bendary M, Neamatallah M, Elalfy H. *Br J Biomed Sci* 2019; **76** (1): 11–6. Assessment No A101019

01	Approximately 20% of hepatitis C virus (HCV)-infected cases are able to clear the virus.
02	Chemokines are usually referred to as either homeostatic or pro-inflammatory, the latter initiating the signalling pathways by which leukocytes undergo migration and extrusion from blood into tissues.
03	Expression of CC chemokine receptor type 2 (CCR2) occurs on macrophages and monocytes, but not on dendritic cells (DCs) or T cells.
04	Understanding the pathogenesis of the disease is determined mainly by observational studies of HCV-infected patients and *in vivo* experiments.
05	In this study, the negative control group comprised 1460 healthy household contacts.
06	HCV-infected patients have significantly increased transcription levels of CCR2 and CCL2 mRNA in liver tissue.
07	Mean aspartate aminotransferase (AST) level in the control group was 45 IU/L.
08	Of all individuals infected with HCV, at least 70% develop chronic disease, with 20–50% advancing to cirrhosis.
09	Antibodies to HCV were determined by enzyme immunoassay, and qualitative PCR was used to measure HCV seropositive patients.
10	Results suggest that the A allele of rs1799864 G/A polymorphism is associated with higher risk for development of chronic hepatitis C (CHC).
11	Interferon (IFN)-inducible CCL2 is released by Kupffer cells early in the infection, resulting in stimulation of infiltrating monocytes including CCR2+ plasmacytoid DCs.
12	Heterozygosity of all the single nucleotide polymorphisms (SNPs) in the three groups studied ranged from 0.19 to 0.51.
13	Carriage of allele A of *CCR2* rs743660 G/A polymorphism was shown to be significantly higher in the CHC group compared to the other two groups.
14	Chemokines and chemokine receptors are not involved in leukocyte aggregation at immune response sites.
15	A previous study of haemodialysis patients with HCV reported that the frequency of the *CCR2* rs1799864 genotype was significantly reduced in an HCV-infected patient group.
16	Interaction of CCL5 with CCR5 has no significance during HCV infection.
17	Genetic analysis of subjects taking part in the current study demonstrated the contribution of *CCL2* and *CCR2*, but not *CCL5*, in the pathogenesis of HCV infection.
18	All samples were successfully genotyped for rs13900 while 100 samples from the SVC group failed to be genotyped for the other three SNPs.
19	There is compelling *in vitro* and *in vivo* evidence of the important role of *CCL5* as a mediator of experimental liver fibrosis.
20	Frequency of the CCR5Δ32 polymorphism decreases from northern to southern Europe and is completely missing in African and Asian cohorts.

TLR3 and *TLR4* SNP variants in the liver disease resulting from hepatitis B virus and hepatitis C virus infection.

Sghaier I, Zidi S, Mouelhi L *et al. Br J Biomed Sci* 2019; **76** (1): 35–41. Assessment No T101019

01	With almost one million new cases and approximately 600,000 deaths recorded per year, hepatocellular carcinoma (HCC) ranks as the fifth most common cancer worldwide.
02	TLR4 influences the chronicity of virus infection and thus subsequent pathological changes including liver cirrhosis and HCC.
03	Homogeneity in TLR3 and TLR4 expression and levels are due to specific intronic and exonic gene variants in both genes.
04	The study recruited 174 chronic HBV carriers and 100 chronic HCV carriers, plus 360 individuals seronegative for both HBV and HCV to serve as controls.
05	There was no difference in the sex ratios of the HBV patients, but age increased with liver disease stage.
06	No significant link was found between *TLR3* rs3775290 major allele genotype and HBV infection.
07	The rs4986790 minor G allele was more frequent among HBV-infected patients.
08	Both homozygous major (C/C) and heterozygote (C/T) *TLR3* rs3775290 genotypes were more frequent among patients with cirrhosis.
09	Thirty patients in the HBV group had hepatocellular carcinoma.
10	In both HBV and HCV cohorts, increased age and male sex were linked to disease severity.
11	*TLR3* (rs3775290) and *TLR4* (rs4986790) genotyping was performed by PCR-restriction fragment length polymorphism (PCR-RFLP) methodology.
12	Chronic viral infection may increase by 10- to 100-fold the risk of HCC.
13	Effective detection and control of viral replication depends on viral and host immunity.
14	The carriage of *TLR3* Asp299Gly variant results in poor responsiveness in TLR signalling, which in turn facilitates HCV escape from immune surveillance.
15	Results showed little differences in distribution of alternate alleles in earlier stages of infection.
16	Persistence of HBeAg seronegativity (>6 months) in HBV-infected patients results from mutations in precore and basal core promoter regions of HBV DNA.
17	Previous studies have shown that mutations in molecules involved in TLR4 signalling are associated with lymphoma.
18	Figure 1d plotted α-fetoprotein (AFP) level in HCV patients with the *TLR3* rs3775290 genotype according to disease stage.
19	In one study, almost three-quarters of HCC was attributed to HCV infection.
20	Genomic DNA was extracted from peripheral venous blood using the QIAamp DNA Blood Mini Kit.

REFLECTIVE LEARNING

01	Perform a literature search for the CCR5Δ32 polymorphism and then summarise its role in disease.
02	The authors previously published a paper on the association of SNPs of Toll-like receptor genes with susceptibility to HCV infection. Explain in detail why this work represents an advance in biomedical science.

01	Non-alcoholic fatty liver disease (NAFLD) has emerged as a health problem worldwide. Discuss the role that genetic factors such as single nucleotide polymorphisms play in the aetiology of this condition.
02	Explain the meaning of the term heterogeneity in relation to gene expression in patients with hepatitis.

IBMS Institute of Biomedical Science
Continuing Professional Development

A wide range of training courses, CPD and local events and activities is listed below. Members are advised to contact organisers for further information. A full list is available on the IBMS website.

EVENTS AND TRAINING COURSES

DATE	TITLE	VENUE CONTACT
April		
2-3 Apr	**European Histopathology Forum**	Leamington Spa I michael.2.fulleylove@gsk.com
3 Apr	**Intermediate Immunohistochemistry**	Sheffield I l.baxter@sheffield.ac.uk
3 Apr	**Urinary Tract Cytology for Technical Staff**	Bristol I SWRCTC@nbt.nhs.uk
5 Apr	**Blood Sciences short course**	London I c.ferrier@westminster.ac.uk
5 Apr	**Fourth Cardiac Marker Dialogues meeting ("high sensitivity" cardiac troponin – still got it after all these years: is there anything new around the corner?)**	Glasgow I alan@ukneqas-cm.org.uk
7-11 Apr	**Microbiology Society Annual Conference 2019**	Belfast I conferences@microbiologysociety.org
8-12 Apr	**Pre-exam course in gynaecological cytology**	Harrow I LNWH-tr.lrctcbooking@nhs.net
8-12 Apr	**BMS/cytoscreener update course in gynaecological cytology**	Harrow I LNWH-tr.lrctcbooking@nhs.net
10 Apr	**UK NEQAS Cellular Pathology Technique immunocytochemistry staining beginners workshop**	Newcastle-upon-Tyne I chantell.hodgson@nhs.net
11 Apr	**UK NEQAS Cellular Pathology Technique immunocytochemistry intermediate/trouble shooting workshop**	Newcastle-upon-Tyne I chantell.hodgson@nhs.net
12 Apr	**Blood sciences short course**	London I c.ferrier@westminster.ac.uk
13 Apr	**Biomed online learning courses**	Online I c.e.ronan@gre.ac.uk
16-18 Apr	**BSAC Residential Workshops for EUCAST Susceptibility Testing**	Cardiff I ecarruthers@bsac.org.uk
17 Apr	**Medical laboratory assistant – introductory course**	Harrow I LNWH-tr.lrctcbooking@nhs.net
25 Apr	**Blood sciences workshops – templates of haematology**	Birmingham I info@bloodsciencesworkshops.co.uk
25 Apr	**Microbial genomics workshop**	London I v.b.patel@westminster.ac.uk
May		
2 May	**One-day update in Cervical Cytology**	Bristol I SWRCTC@nbt.nhs.uk
2-3 May	**Focus 2019**	Glasgow I focus2019@acb.org.uk
4 May	**BDIAP Molecular Pathology Study Day**	London I lisa.browning@ouh.nhs.uk
8 May	**UK NEQAS Cellular Pathology Technique non-gynae cytology beginners/refresher workshop**	Gateshead I chantell.hodgson@nhs.net
9 May	**UK NEQAS Cellular Pathology Technique non-gynae cytology intermediate workshop**	Gateshead I chantell.hodgson@nhs.net
10 May	**Blood Sciences short course**	London I c.ferrier@westminster.ac.uk
14 May	**CM-PATH Biobanking Workshop – "Do we really need another Biobank?"**	London I helen.pitman@ncri.org.uk
16 May	**Respiratory Microbiology – a day of inspiration!**	London I swallis@mastgrp.com
17 May	**Blood Sciences short course**	London I c.ferrier@westminster.ac.uk
24 May	**Haematinics and white blood cell disorders**	London I c.ferrier@westminster.ac.uk
June		
6 Jun	**IBMS Registration Portfolio Workshop**	London I c.ferrier@westminster.ac.uk
6 Jun	**Update in Cervical Cytology for pathologists, consultant BMS and holders of the Advanced Specialist Diploma in Cytology**	Bristol I SWRCTC@nbt.nhs.uk

DATE	TITLE	VENUE CONTACT
10 Jun-21 Jul	**Introductory Course in Cervical Cytology**	Bristol I SWRCTC@nbt.nhs.uk
11-12 Jun	**Practical and Clinical Microbiology of Anaerobes (P&CMAn)**	Cardiff I deborah_robinson@dwscientific.co.uk
13-14 Jun	**Anaerobe 2019: Changing perceptions of anaerobic bacteria; from pathogen to the normal microbiota and back; a Microbiology Society-focussed meeting**	Cardiff I s.gavrila@microbiologysociety.org
19 Jun	**UK NEQAS Cellular Pathology Technique special staining beginners/refresher workshop**	Newcastle upon Tyne I chantell.hodgson@nhs.net
20 Jun-20 Jul	**UK NEQAS Cellular Pathology Technique specialist workshop A**	Newcastle upon Tyne I chantell.hodgson@nhs.net
25 Jun	**One-day update in Cervical Cytology – metaplasia/cancer audit day**	Bristol I SWRCTC@nbt.nhs.uk
July		
8-11 Jul	**Identification of pathogenic funghi**	Bristol I michael.palmer@phe.gov.uk
8-12 Jul	**Electron Microscopy Summer School**	Leeds I katejermey@rms.org.uk
15-17 Jul	**Light Microscopy Summer School**	York I katejermey@rms.org.uk
15-26 Jul	**Introductory Course in Cervical Cytology**	Bristol I SWRCTC@nbt.nhs.uk
18-19 Jul	**Getting the most from your confocal course**	York I katejermey@rms.org.uk
26 Jul	**Train the Trainer**	London I c.ferrier@westminster.ac.uk
August		
7 Aug	**UK NEQAS Cellular Pathology Technique tissue preparation techniques workshop**	Gateshead I chantell.hodgson@nhs.net
8 Aug	**UK NEQAS Cellular Pathology Technique tissue morphology and recognition workshop**	Gateshead I chantell.hodgson@nhs.net
8 Aug	**UK NEQAS Cellular Pathology Technique non-gynae cytology beginners/refresher workshop**	Gateshead I chantell.hodgson@nhs.net
9 Aug	**UK NEQAS Cellular Pathology Technique non-gynae cytology intermediate workshop**	Gateshead I chantell.hodgson@nhs.net
14 Aug	**UK NEQAS Cellular Pathology Technique special staining beginners/refresher workshop**	Newcastle upon Tyne I chantell.hodgson@nhs.net
15 Aug	**UK NEQAS Cellular Pathology Technique specialist workshop B**	Newcastle upon Tyne I chantell.hodgson@nhs.net
20-22 Aug	**BSAC Residential Workshops for EUCAST Susceptibility Testing**	Cardiff I ecarruthers@bsac.org.uk
September		
4 Sep	**One Day Update in Cervical Cytology**	Bristol I SWRCTC@nbt.nhs.uk
4 Sep	**UK NEQAS Cellular Pathology Technique immunocytochemistry staining beginners workshop**	Newcastle upon Tyne I chantell.hodgson@nhs.net
5 Sep	**UK NEQAS Cellular Pathology Technique immunocytochemistry intermediate/trouble shooting workshop**	Newcastle upon Tyne I chantell.hodgson@nhs.net
9-13 Sep	**Flow Cytometry course**	York I katejermey@rms.org.uk
October		
15 Oct	**UK NEQAS Cellular Pathology Technique Mohs workshop**	Gateshead I chantell.hodgson@nhs.net
16 Oct	**UK NEQAS Cellular Pathology Technique BMT workshop**	Gateshead I chantell.hodgson@nhs.net
17 Oct	**UK NEQAS Cellular Pathology Technique renal workshop**	Gateshead I chantell.hodgson@nhs.net
November		
12 Nov	**Fine Needle Aspiration Cytology for Technical Staff**	Bristol I SWRCTC@nbt.nhs.uk
13 Nov	**UK NEQAS Cellular Pathology Technique non-gynae cytology beginners/refresher workshop**	Gateshead I chantell.hodgson@nhs.net
14 Nov	**UK NEQAS Cellular Pathology Technique Non Gynae Cytology Intermediate workshop**	Gateshead I chantell.hodgson@nhs.net
27 Nov	**Update in Cervical Cytology for pathologists, consultant BMS and holders of the Advanced Specialist Diploma in Cytology**	Bristol I SWRCTC@nbt.nhs.uk
December		
3 Dec	**One Day Update in Cervical Cytology – HPV cancer audit day**	Bristol I SWRCTC@nbt.nhs.uk

HERE TO HELP

HOW TO UPGRADE YOUR MEMBERSHIP

In response to the recent IBMS members' survey, membership manager **Sandra Shevlin** answers your queries about how to upgrade.

Our membership grades are designed to support you at every stage of your career, and to advance and develop your expertise in biomedical science. Whether you are a student, a support staff worker, newly registered, or somebody heading towards the peak of the profession, your membership grade is built to provide you with the tools to succeed in the current phase of your career.

To fully benefit from our services, you are advised to upgrade whenever able. This ensures that you are using the correct postnominal letters in your professional correspondence – thus reflecting the full extent of your experience and knowledge – and that you have access to all the relevant qualifications and roles that come with your grade.

Upgrading is an easy process – complete the IBMS 2019 membership application form (available at ibms.org/join) and send it to subs@ibms.org with upgrade ticked and copies of your relevant qualifications attached (if not previously submitted).

Below is an outline of what you need in place before submitting for an upgrade:

eStudents

Anyone studying a biomedical science related degree can join as an eStudent. Once you graduate and gain a UK honours degree, you are eligible to upgrade to Licentiate.

Associates

An Associate must be working in biomedical science and hold a qualification ranging from Level 2 (GCSE, City and Guild Level 2) to an ordinary (non-honours) degree UK NARIC-confirmed undergraduate qualification that is not equivalent to a UK Honours degree. In order to upgrade, an Associate must have completed a UK honours degree in a biomedical science related subject.

Licentiates

A Licentiate must hold a UK honours (or UK NARIC-assessed as honours equivalent) degree in a biomedical science related subject. In order to upgrade to Member, a Licentiate must have completed an IBMS Specialist Diploma or Diploma of Specialist Practice (or an equivalent level professional qualification, such as CPSM/IBMS discipline specific log book, STP, BBTS Specialist Certificate, BISHI Diploma).

Licentiates can also upgrade to Member if they have a biomedical science related M-level academic qualification (e.g. MSc, MPhil, MBA), or a UK NARIC-confirmed M-level, equivalent along with two years' relevant professional experience.

Members:

To upgrade to Fellow, a Member must have one of the following:

- IBMS Higher Specialist Diploma, Diploma of Higher Specialist Practice,
- IBMS Diploma in Expert Practice in Non-Gynaecological Cytology as well as an IBMS Advanced Specialist Diploma in Non-Gynaecological Cytology
- IBMS Diploma in Expert Practice in Histological Dissection as well as an IBMS Advanced Specialist Diploma in Specimen Dissection
- An equivalent level professional qualification (e.g. HSST, FHEA)
- A biomedical science-related D-level academic qualification (e.g. PhD), or UK NARIC confirmed equivalent, and five years' professional experience in an area related to biomedical science.

In January 2018, we also introduced the Experiential Route to Fellowship. This route is for individuals who are working in an advanced scientific or senior managerial role (at least NHS band 7) in the field of biomedical science with at least six years' post-registration experience. Admittance to the grade of Fellow via the Fellowship Experiential Route involves a more comprehensive application process. In order to find out more, please visit the "Join" section of ibms.org, click "Fellow" on the sub-menu and then "Experiential Route to Fellowship". This will give you access to the application and guidance notes.

For information on IBMS membership upgrades or the criteria for admittance into the various grades of membership, please do not hesitate to contact our membership team at **subs@ibms.org**

IMAGES: ISTOCK

Senior Biomedical Scientist

Band 7 – Histopathology

Reference: DOH&-008585

Isle of Man Government

We have an exciting opportunity for an experienced Specialist Biomedical Scientist to join our Histopathology department. Candidates must be HCPC registered and possess an MSc./ Higher Specialist Diploma or equivalent.

The Histopathology Laboratory provides Histology and Cytopathology services to the Island. Members of the department are expected to rotate through the department benches. As senior BMS you will be expected to co-ordinate the day to day running of the laboratory and take the role of quality lead for Histology within Pathology.

Successful candidates can apply participate in the voluntary multidisciplinary on call rota, following suitable training and assessment, for which extra remuneration will apply.

A police check will be required for this post.

A relocation package of up to £7000 is available to off island candidates who are successful at interview. A retention bonus and housing allowance (payable over 3 years) are also applicable to this post. For more information about moving to the Island please visit **www.locate.im**

How to Apply

For further information contact John Nippress, Chief Biomedical Scientist Histopathology, on **01624 650654**.

To apply online please visit **www.gov.im/jobs** and search for '8585'.

The closing date for applications is 30th April 2019.

For a career that makes a difference

JOB OPPORTUNITIES FOR Trainee/Specialist Biomedical Scientists

What we offer:

- Exciting opportunities across all disciplines and locations.
- Automatic advancement to Specialist (Band 6) on completion of relevant qualifications and competencies.
- Support in your training and future career development.
- Opportunities to participate in various service improvement initiatives.
- The chance for you to participate in laboratory events to showcase our profession.
- Opportunities for career progression.

Apply online: **www.jobs.hscni.net**
Closing date for applications: **Friday 19th April 2019**
Interviews week commencing 3rd June 2019.

YOUR NEXT CAREER STEP IS WITH THE DOCTORS LABORATORY

Opportunities have arisen at the largest independent clinical pathology service organisation in the UK.

The Doctors Laboratory provides an extensive range of testing services to the NHS and the private sector across 37 laboratory sites across the UK. We have several multi-disciplinary roles at our Manchester laboratory based at Salford Quays and a Senior Histopathology role based at our Northwick Park Hospital site in Harrow, London.

We pride ourselves on the quality of the working environment we offer our staff as well as the cutting-edge technologies used. Staff enjoy a varied CPD programme led by our Education and Training Faculty, equipping them for a rewarding and accomplished career.

Full Time Multi-Discipline BMS @ Manchester *(ref: SQ2348)*
Part Time Multi-Discipline BMS @ Manchester *(ref: SQPT2347)*
Bank Multi-Discipline BMS @ Manchester *(ref: SQBMS2578)*
For further job details: **shilla.mutamba@tdlpathology.com**

Senior BMS (Histopathology) @ Northwick Park Hospital *(ref: NWPHS3306)*
For further job details: **parfaite.haydock-wilson@tdlpathology.com**

For a full jobs list, visit: **www.tdlpathology.com**

Closing Date: **26th April 2019**

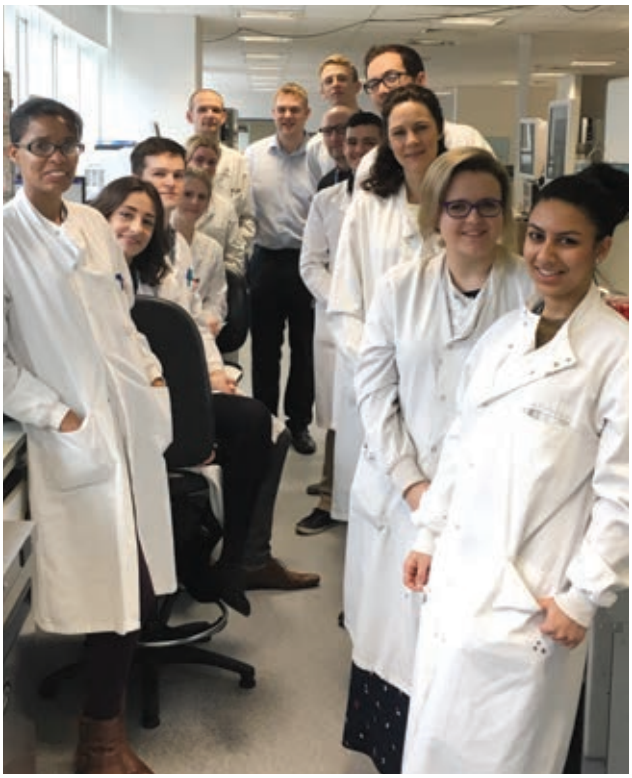
The closing date may be earlier where there is high interest.

TDL is a committed equal opportunities employer and does not unlawfully discriminate on the basis of any status or condition protected by applicable UK employment law.

MY LAB

CLINICAL BIOCHEMISTRY AND IMMUNOLOGY

Immunology Manager and Pathology Training Lead **Matthew Smith** gives a guided tour of his lab at the North West Anglia NHS Foundation Trust.



The clinical biochemistry and immunology laboratory at Peterborough City Hospital makes up part of the pathology services department of the recently formed North West Anglia NHS Foundation Trust. The trust was formed in April 2017 and is a result of the merger of hospital trusts at Peterborough, Hinchingbrooke and Stamford.

The new trust provides care to a population of 700,000 residents living in Cambridgeshire, South Lincolnshire and the neighbouring counties.

The last 18 months have been an exciting, but challenging time to work for the trust, as we have gone through the wider organisational change associated with these types of mergers. The senior leadership team in pathology underwent a restructure during autumn 2018 that has now fully integrated the pathology laboratories across the trust. The outcome of this has been fantastic examples of the teams at the different sites working together to share best practice, and a continued desire to meet our goal of doing the best we possibly can for all our patients and service users.

Pathology services at Peterborough were the first NHS pathology laboratories in the UK to have achieved pan-service ISO15189 accreditation as a single centre. Since that amazing achievement (and presentation at the House of Lords!) in 2015, we have now come to the end of our first accreditation cycle. While I am writing this, we are in the midst of our latest inspection... hopefully we will be able to evidence to the assessors the continued quality improvements that I know we have made since our last inspection.

The clinical biochemistry and immunology laboratory is made up of a team of consultant chemical pathologists, consultant immunologist, biomedical scientists and assistant technical officers.

The biomedical scientists rotate between biochemistry and immunology, developing specialist skills in both disciplines. Biochemistry and immunology have an extensive test repertoire for a district general hospital and we see an increasing number of interesting and unusual cases as the local population continues to increase.

We are an IBMS-accredited training laboratory and have an excellent track record of staff completing Registration Portfolios, Specialist Portfolios and Higher Specialist Diplomas. We provide a 24/7 service to the trust and process the direct access pathology for our surrounding GP surgeries. This results in our biochemistry and immunology laboratory undertaking in excess of six million tests per year.

The laboratory has also recently started the process of going through a complete analyser refresh of the mainline biochemistry equipment, as the current equipment is end of life after being in use since we moved to the new hospital building in 2010. We are currently trying to minimise disruption to our users, particularly the acute services, while the old equipment is relocated and the new kit installed and verified ready for use. The refresh is expected to be completed around September, so we have a while to go, but everyone is excited about the potential opportunities and service improvements the new equipment will bring.

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Enteroaggregative E.coli (EAEC)	*Astrovirus*
Enteroinvasive E. coli (EIEC)/Shigella	*Norovirus GI*
Enteropathogenic E. coli (EPEC)	*Norovirus GII*
Enterotoxigenic E. coli (ETEC) lt/st	*Rotavirus A*
Campylobacter spp. (C.jejuni, C.upsaliensis, C.coli)	*Sapovirus (GI, GII, GIV, GV)*
Plesiomonas shigelloides	
Salmonella spp.	**Parasitic**
Shiga-like toxin producing E.coli (STEC) stx1/stx2	*Cryptosporidium spp.*
Shiga-like toxin producing E.coli (STEC) O157:H7	*Cyclospora cayetanensis*
Vibrio cholerae	*Entamoeba histolytica*
Vibrio parahaemolyticus	*Giardia lamblia*
Vibrio vulnificus	
Yersinia enterocolitica	

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