ONE-TO-ONE

COVID-19 VARIANTS

Nikhil Faulkner explains his research in immunogenicity: *p.16*

BLOOD TRANSFUSIONS

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Key findings from the annual report by the SHOT scheme: *p.23*

WELLBEING

MENTAL HEALTH

Azuma Kalu on job pressure and redefining the workplace: *p.34*

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SEPTEMBER 2021

THE SILENT PANDEMIC

From dog food to climate change: issues around antimicrobial resistance

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Typical sensitivity levels and time to result of different methods for SARS-CoV-2 viral detection

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WORLD LEADER IN DIAGNOSTICS

IBMS Chief Executive **David Wells** looks at a promising future for the profession and the support that is needed.

With the launch of HM Government's Life Sciences Vision and its mantra "Build Back Better", I've been thinking about how the IBMS can make sure that this vision becomes a force for positive change in the profession.

The Prime Minister said that he wants to make the UK the best place in Europe to invest in life sciences – and highly skilled life science jobs – making us the world leader in diagnostics. I can't remember a previous Prime Minister even mentioning our profession before now. The importance of our work has truly been recognised – and we must try to make sure that the changes that come benefit us all.

Roche Diagnostics' recent report, *The Future of Diagnostics Delivery in the UK*, pointed out that 95% of all clinical pathways rely on patient access to pathology services, but that funding for pathology only accounts for 2% of the current NHS budget. I hope that any future investment will reflect the performance, outcomes and competence of our workforce and begin to redress this imbalance.

Whether in healthcare, industry or academia, we are all a key part in what comes next. The IBMS will continue to inform and promote best practice at the highest levels. This means championing scalable diagnostics for a wide range of infectious pathogens and earlier, smarter diagnosis to predict and control the spread and outcome of any disease.

The workforce also needs expansion. Any future vision must prioritise increases in workforce supply and development. Adequately staffed laboratories with highly skilled, registered professionals are essential and they must also be approved for training the pipeline of future scientists.

Another priority will be a big data, pro-active diagnostic approach. In order to achieve this, all new infrastructure must be able to integrate with public health and healthcare systems, from social care to secondary care – linking the National Institute for Health Protection, UK Health Security Agency and NHS for better patient outcomes.

Over the last 18 months, our molecular diagnostic capability has gone from being able to process 300,000 molecular microbiology tests per year in England, to performing that number in a day – and this is just the tip of the iceberg in terms of what could be done with well-planned investment.

I hope the Prime Minister is serious about this vision – and that the people who carry it out listen to those who understand the complexity of maintaining our world-class professional standards.

David Wells
Chief Executive

IBMS

Institute of Biomedical Science is the professional body for the biomedical science profession.

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COVID NEWS IN NUMBERS

Just 14 postcodes in England and Wales have suffered zero COVID-19 deaths since the start of the pandemic.

An Office for National Statistics (ONS) report in August broke down the **fatalities** across **7200 neighbourhoods**. Those postcodes that **did not have any COVID-19 deaths** included parts of **Bristol, Leeds, Manchester, Cornwall, Devon** and **Somerset.**

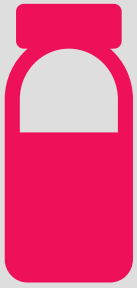
A text message reminder to book a COVID-19 jab can boost rates, according to a study of more than 90,000 people in California.

A **"nudge" reminder sent one day after individuals became eligible** increased appointments and vaccination rates by **6 percentage points** and roughly **3.6 percentage points**, respectively. A second reminder a week later boosted appointments and jabs by a further **1.7 and 1.1 percentage points**, respectively.

$25,000 SIGNING BONUS

A US Arkansas hospital system was offering signing bonuses of up to $25,000 for starters, due to staff shortages.

University of Arkansas for Medical Sciences had **360 healthcare vacancies**, with **200 for nurses**, it was reported. The hospital system was estimated to be short of **50% of its nursing workforce.**



FLU JABS AND COVID

US research shows that people who got the flu jab up to six months before contracting COVID-19 were 58% less likely to visit ER.

Researchers were **unable to confirm if the jab itself is protective**, or if a person who gets a flu vaccine is likely to be healthier than those who don't.

400,000

Almost **400,000 people in the UK** say they have been suffering from **long COVID for more than a year**, data suggest.

An estimated **1.46% of the population** say they've been left with persistent symptoms. The ONS, which carried out the major poll, said this equated to around **945,000 people**. Among those, **40% said this had been the case for at least 12 months.**

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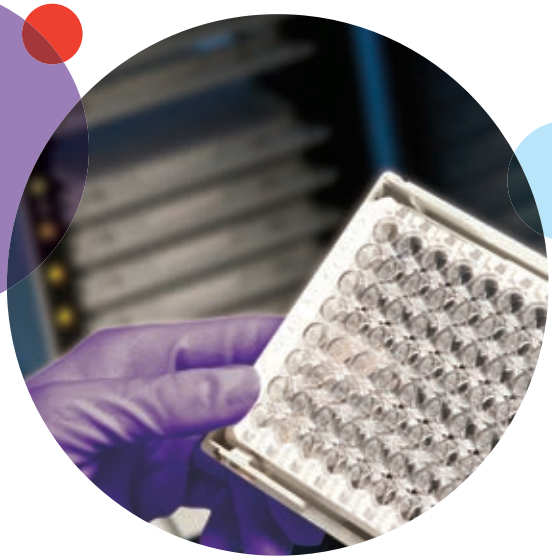

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Capture's IgG-specific technology provides high sensitivity for clinically significant antibodies, without the noise of IgM antibodies. Recent reports have also highlighted the use of Immucor products to help mitigate interference with monoclonal antibody therapies.[1,2]

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[1]Howard-Menk C, Crane JE, Doshi L, Papari M. HU5F9-G4 Monoclonal Anti-CD47 Therapy: A First Experience with Interference in Antibody Identification. Transfusion 2018; 58 [S2]:177A.
[2]De Vooght KMK, Lozano M, Bueno JL, et al. Vox Sanguinis International Forum on typing and matching strategies in patients on anti-CD38 monoclonal therapy: summary. Vox Sanguinis 2018; 113:492-498.

SCIENCE NEWS

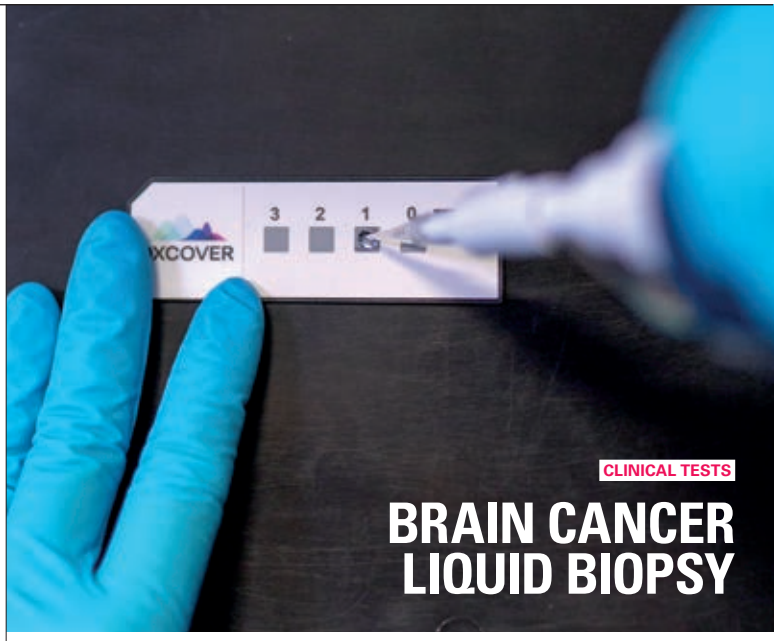


IMAGE: © DXCOVER

COVID-19 VACCINATION

Jab in the arm, or puff up the nose?

A team of researchers affiliated with multiple institutions in the US and UK has found that administering the AstraZeneca COVID-19 vaccine intranasally to infected hamsters and monkeys reduced viral loads in nasal swabs, suggesting reduced shedding.

Currently, the vast majority of vaccines developed and in use are intramuscular, given via shots in the arm, but a study from the University of Alabama noted that vaccines given intranasally would seem to make more sense, since COVID-19 is a disease of the nose, throat and lungs.

Prior research has also shown that vaccines given intranasally confer immunity for a shorter period of time than intramuscular vaccination.

The scientists noted that the best approach might be a combination of a shot in the arm along with a puff of mist up the nose, to confer both short-term and long-term protection.

→ **bit.ly/3lOe6pQ**

CLINICAL TESTS

BRAIN CANCER LIQUID BIOPSY

Early detection of brain cancer has moved one step closer, according to new research.

New testing technology – the Dxcover Liquid Biopsy – has been shown to be effective even in the earlier days of cancer growth, at a smaller volume and lower stage.

Matt Baker, one of the scientists behind the test, said: "This breakthrough is a watershed moment in the development of early cancer detection. The study demonstrates the effectiveness of our Dxcover Brain Cancer Liquid Biopsy at detecting even the smallest brain tumours, which is great news for the care of future brain cancer patients."

The study involved 177 patients with varying sizes of brain tumours providing blood samples for analysis by Dxcover.

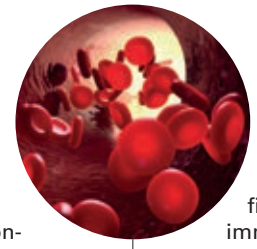
The samples underwent the spectroscopic analysis under infra-red light and were processed using machine learning software. The test and analysis were found to be effective in identifying brain tumours in patients with gliomas as small as 0.2 cm^3.

Dxcover Limited has raised £5.1m in funding to develop its spectroscopy and artificial intelligence technology as a Multi Cancer Early Detection (MCED) Platform.

→ **bit.ly/3yCXS6w**

PRELIMINARY DATA

CRISPR TREATMENT FOR BLOOD DISEASES



IMAGES: ISTOCK/SHUTTERSTOCK

A collaborative team of researchers has presented preliminary data showing that a CRISPR-based gene-editing therapy for inherited blood disorders is safe and effective.

The one-time gene editing treatment, known as CTX001, which was discovered and developed by Vertex Pharmaceuticals and CRISPR Therapeutics, has been given to 22 patients – 15 with transfusion-dependent beta-thalassaemia and seven with sickle cell disease – with the aim of boosting the production of fetal haemoglobin in order to correct the defective gene for haemoglobin associated with both diseases.

All the patients demonstrated sustained increases in fetal haemoglobin and total haemoglobin, with limited and manageable side effects related to the transplant procedure.

The patients with beta-thalassaemia have been transfusion-free since they received the infusion.

The seven patients with severe sickle cell disease have had no vaso-occlusive crises – the acute episodes of severe pain that also involve organ damage.

Stephan Grupp, study co-author and pioneer of the first cellular immunotherapy in childhood cancer, said: "What we're seeing in these early days is how transformational this is for the sickle cell patients we've seen. We are hearing that it is life-changing."

→ **bit.ly/3jQMJsK**

HOT

DETERGENT

Non-immune, human cells can defend themselves from infections using APOL3 – a detergent-like protein that dissolves bacterial membranes, according to a new study.

HOT

BARBIE

Barbie maker Mattel has created a doll of the scientist who designed the Oxford coronavirus vaccine, Professor Dame Sarah Gilbert.

HOT

HEALTHY EATING

Among older adults with obesity, combining aerobic exercise with moderate reductions in total daily calories led to greater improvements in vascular health, compared with exercise alone.

NOT

SOCIAL MEDIA

The Hunstman Cancer Institute reports that 25% of the 200 most popular cancer articles on social media contain misinformation that could threaten patients' chance of survival.

NOT

DIABETES

A long-term study suggests a link between gestational diabetes and cardiovascular diseases later in life, even if blood sugar levels return to normal after pregnancy.

NOT

POLLUTION

A small increase in fine particle air pollution raises dementia risk by 16%, University of Washington researchers found using decades' worth of data on air quality and neurological symptoms.

CELL SCIENCE

ONE FAT CELL SUBTYPE RESPONDS TO INSULIN STIMULATION

Scientists have discovered that there are three different subtypes of mature fat cells in white adipose tissue and that it is only one of these – AdipoPLIN – that responds to insulin.

The findings, from a team at Karolinska Institutet in Sweden, may be relevant for future treatments of metabolic diseases such as Type 2 diabetes.

Researcher Niklas Mejhert said: "These findings increase our knowledge about the function of fat tissue.

"They show that the overall capacity of fat tissue to respond to insulin is determined by the proportion and function of a specific fat cell subtype. This could have implications for diseases such as obesity, insulin resistance and Type 2 diabetes."

In the study, which is published in the journal *Cell Metabolism*, the researchers identified 18 cell classes that form clusters in white adipose tissue in humans. Of these, three constituted mature fat cells with distinct phenotypes.

To test if the fat cell subtypes were linked to any specific function, the researchers examined in part how these subtypes in four people reacted to short-term increases in insulin levels.

The results showed that insulin activated the gene expression in the subtype AdipoPLIN, but did not materially affect the other two subtypes.

Additionally, the response to insulin stimulation was proportional to the individual's whole-body insulin sensitivity.

→ **bit.ly/3yE3cq6**

LEUKAEMIA

NON-INVASIVE IMAGING

Scientists have identified visual changes in the bone marrow caused by acute myeloid leukaemia. The imaging technique used is now being tested in hospitals to see if it could help predict whether different treatments will be effective in individual patients.

The team used dynamic contrast-enhanced MRI in mice to see how this cancer affects the bone marrow blood vessels. The technique is useful for measuring blood flow and permeability of different tissues. They found decreased blood flow in the bone marrow of mice with AML in comparison with healthy mice.

→ **bit.ly/3jLTHza**

IMAGES: ISTOCK/SHUTTERSTOCK/SCIENCE PHOTO LIBRARY

MOLECULAR PATHOLOGY

Precise isolation of circulating tumour cells

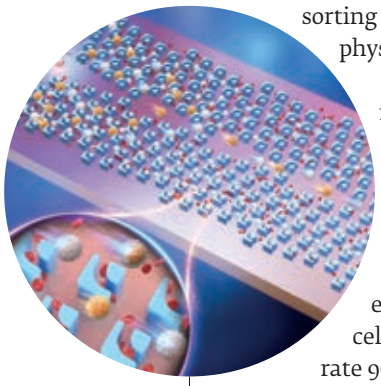


IMAGE: SIAT

A novel hydrodynamic structure has been proposed to achieve one-step and label-free isolation of circulating tumour cells (CTCs) and cell-leukocyte fusion cells (CFCs) from whole blood.

The integrated microfluidic platform isolates rare CTCs and CFCs with high purity and high cell viability, enabling direct downstream analysis with single-cell RNA sequencing.

Researchers proposed a filter deterministic lateral displacement (filter-DLD) concept to achieve one-step and label-free CTCs and CFCs isolation.

The novel hydrodynamic structure is designed and simulated by multiphysics finite element analysis, which enables precise manipulation of cell motion.

The filter-DLD structure not only has a lower critical cell separation size than conventional DLD designs, but also achieves a higher depletion rate of smaller red blood cells, which make up the largest proportion of blood.

By combining the filter-DLD concept and the cascaded chip design, researchers fully explored the potential of rare cell sorting based on physical properties.

The integrated microfluidic platform demonstrated excellent performance for size-based cell separation, and achieved high separation efficiency (>96%), high cell purity (WBC removal rate 99.995%), high cell viability (>98%) and high processing rate (1 mL/min).

Using this platform, researchers analysed samples from non-small cell lung cancer patients. CTCs and tumour CFCs were efficiently collected, and changes in CTCs levels were used for treatment response monitoring.

→ **rsc.li/3jDZk2c**

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TECH NEWS

IMMUNOVIA

PANCREATIC CANCER

Immunovia has received final approval to begin patient testing for the IMMray PanCan-d test – the first blood test on the market dedicated to the early detection of pancreatic cancer.

Approval was received from the Massachusetts Department of Public Health on 3 August.

The test recognises biomarker signatures and has the potential to increase the survival of patients by detecting pancreatic cancer when surgical resection is possible.

→ **immunovia.com**

MDC

RADIOCHEMISTRY

Medicines Discovery Catapult has relaunched radiochemistry at the Wolfson Molecular Imaging Centre in Manchester.

The facility, which was closed in 2020, includes the multi-million pound Cyclotron – one of only a handful in the UK.

It will supply hard-to-make radiochemicals to drug discovery biotechs and academic innovators – increasing the UK's potential to discover new and better therapies for patients, faster.

→ **md.catapult.org.uk**

IMAGE (RIGHT): CHRIS BULL-ALAMY

BD

TEST FOR VARIANTS

BD and CerTest Biotec have announced the CE Mark for a molecular test to detect and identify certain SARS-CoV-2 variants.

VIASURE SARS-CoV-2 Variant Real Time PCR Detection Kit for BD MAX can be used as a combined test with VIASURE SARS-CoV-2 (N1+N2) Real Time PCR Detection Kit for BD MAX, or as a reflex test to run variant identification on a SARS-CoV-2-positive sample.

The test snaps into the test-specific position on the BD MAX ExK TNA extraction strip, supplied by BD.

→ **bd.com**

THE BIG QUESTION

THIS MONTH WE ASK

"How can we make labs more sustainable?"

Lee Peters

Special Analytical Techniques Manager
Laboratory Medicine Department
Swansea Bay University Health Board

A recent IBMS Chat on Twitter discussed sustainability in the laboratory and it was interesting to see examples provided of waste, both within and outside of the laboratory.

One area that we need to improve is the packaging of reagents and consumables. It's often the case that reagents are sent in large boxes and full of filler packing material. This is an unnecessary amount of extra cardboard and packaging going into hospital waste. I really believe that we have an opportunity and obligation to liaise with our suppliers to see how we can be smarter about our packaging.

I also believe that we need to start including/expanding sustainability clauses within our equipment tenders to drive this change.

A recent example of our laboratory looking at reducing waste is the creation of sample aliquots. We create secondary aliquots for send-away tests referred to other laboratories, but also for specialist sections within laboratory medicine, which are not on our tracked system. We've consolidated aliquots, so if there are multiple requests for the same piece of equipment then only one, rather than multiple, aliquot tubes are created. This saves plastic and also time sorting these tubes prior to analysis. The multiple aliquots were there for historic reasons, but by liaising with our analytical supplier we made changes and are seeing benefits.

By reviewing our processes, and sharing best practice, we can help support a sustainable laboratory.

IMAGE: ISTOCK

Cherie Beckett

Specialist Biomedical Scientist, Microbiology
The Princess Alexandra Hospital NHS Trust

There must be a collaborative effort between manufacturers, healthcare providers, laboratories and departmental budget holders to ensure laboratories have all available resources and autonomy to be able to make better sustainability choices.

Many have introduced sustainability processes, including turning off computers and lights when not in use, going paperless, ensuring waste segregation, reusing where possible, choosing suppliers with a lower carbon footprint, and adopting lean processes, but we need to do more.

Processes, such as regularly defrosting freezers to allow them to run more efficiently, carrying out environmental audits to assess sustainability, and autoclaving of reusable consumables instead of buying disposable ones, are just a few examples that are better facilitated with a healthy staffing.

There will, of course, be areas that are more troublesome to address, such as fixed laboratory space rendering multiple waste streams less of an option, while in 24/7 laboratories, it is not possible to turn lights, computers and analysers off.

Bringing sustainability into the spotlight and considering the whole picture, from product manufacture, processing and disposal, and everything in between, will go some way to bringing about change. With this in mind, laboratories might consider ambassadors and advocates within their department who can champion change.

Madihah Abbas

Specialist Biochemistry Team Manager
The Christie Pathology Partnership

Sustainability for me is about little things making a big difference – start small and then make big changes. Overall, acting on energy and waste can lead to saving money for patient care. I was part of the Green Impact programme whereby changes in the lab allowed us to become more sustainable. Following are some actions we can all think about.

Switching off lights and equipment when not in use – a simple task that leads to lots of savings. Simple reminder stickers can help.

Regular defrosting of freezers – this will help to conserve electricity.

Recycling as much as possible and re-using items for other purposes – we recycled glass pipettes to local university laboratories for students to re-use.

Thinking before posting – Can this be sent electronically, instead?

Community involvement and raising awareness – supporting your local charities, such as Macmillan Cancer Support.

Only travel if it is vital – consider conference calls or webinars as an alternative, which has happened due to COVID, reducing your carbon footprint. Also, car-pooling or sharing schemes may be available at your trust.

Going paperless by removal of request forms and reducing printing. Also, only allowing double-sided printing.

There are lots of actions that can be taken, but most importantly recognising and motivating those who are making an impact is key so that others follow in their footsteps.

ON THE BOUNDARY OF KNOWLEDGE

Nikhil Faulkner discusses his immunogenicity work with SARS-CoV-2 variants and how the pandemic is changing the nature of research.

Vaccination will be key to the success of the global response to the COVID-19 pandemic. However, an important determining factor is achieving an improved understanding of the threats posed by emerging variants of SARS-CoV-2 and the degree of heterotypic immunity these variants can induce.

A major advance in meeting this challenge was achieved recently by a global collaboration of 29 researchers. Their paper, "Reduced antibody cross-reactivity following infection with B.1.1.7 than with parental SARS-CoV-2 strains", describes how they examined the immunogenicity of SARS-CoV-2 variant B.1.1.7 (Alpha) that arose in the UK in September 2020 and has been detected in more than 50 countries. The study found that "antibodies elicited by B.1.1.7 infection exhibited significantly reduced recognition and neutralisation of parental strains or of the South Africa variant B.1.351 (Beta) than of the infecting variant."

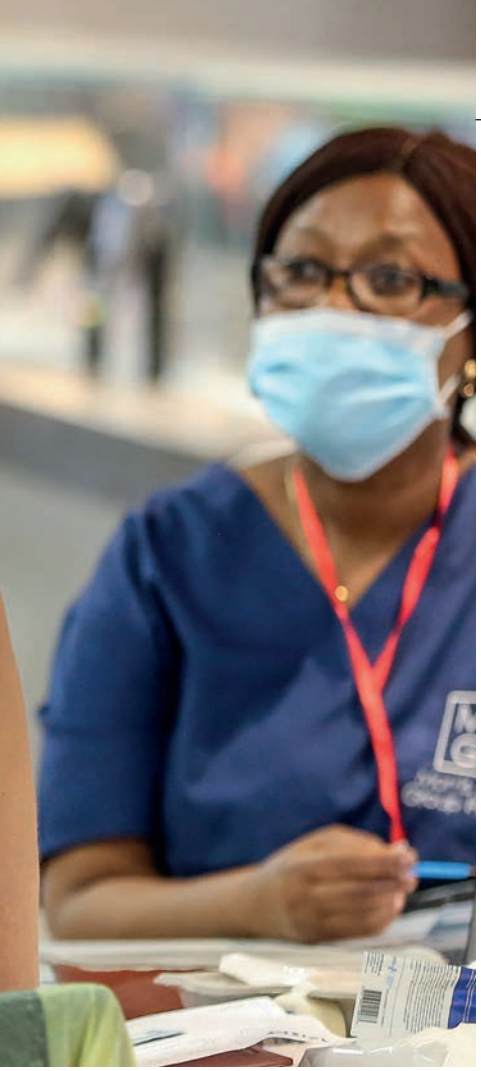
Immunogenicity

The study's lead author Nikhil Faulkner, PhD student at London's Francis Crick Institute, explained the implications of his team's findings. "If we are going to live with COVID-19, we must accept that new variants will arise globally, and we will be exposed to them. Depending on our previous exposure to SARS-CoV-2 variants, our research cautions that we may be more susceptible to infection from one of these novel variants. Those infected with the virus will not know which variant infected them, so it is critical that eligible individuals get vaccinated as vaccines confer protection to varying degrees against disease caused by all known variants."

He notes that viral immunologists now have an opportunity to observe the development of the immune response to a new virus in coming years, which "could help inform us with regards to vaccine design to protect us against future pandemics," he says, "we may also gain clues as to how to better vaccinate against other viruses like influenza."

Technical challenges

One of the challenges of the SARS-CoV-2 variant study was accessing material, as it is not standard practice to sequence the infecting virus upon a positive test result for SARS-CoV-2 outside of hospitals. Faulkner explains: "We collaborated with University College London Hospital, acquiring serum samples from patients with known B.1.1.7/Alpha variant infection. Likewise, with cases of B.1.351/Beta infection in the UK, we obtained the authentic virus isolate from collaborators



IMAGES: GETTY

A positive change has been the willingness for groups to collaborate

in South Africa, where the strain was first described. The work was a huge collaboration, which would have been impossible without a global effort."

A further challenge, adds Faulkner, was that most of their work was undertaken during the Christmas/post-Christmas UK lockdown, "when many of my colleagues had to isolate for various reasons at different stages of the research."

The pace of COVID-19 research

Faulkner's PhD – due for completion by March 2022 – explores immune responses to viral vectors for gene therapy, concentrating on the humoral response to these vectors when introduced into the blood and lungs in the context of cystic fibrosis. However, Faulkner has demonstrated how crucial adaptability is to scientific progress: "During my research, I was using an antibody assay, which a team of us repurposed to study humoral responses to SARS-CoV-2, which led to us studying the degree of cross-reactivity in antibody responses between SARS-CoV-2 variants."

But to what extent has the global demand for speedily acquired COVID-related research knowledge impacted how research is undertaken? "A positive change has been the willingness for groups to collaborate, traceable to the urgency around the pandemic. With little time to learn a new lab technique, researchers collaborate with others who are experts in that technique. Luckily, inter-laboratory collaboration within the Crick was encouraged even before the pandemic. I think research works best when we're united as a field and the success of science throughout the pandemic proves that."

Another COVID-19-related development that Faulkner identifies is the rise of pre-prints: "These arose from the urgency around the pandemic, with labs choosing to share their data promptly for the benefit of the wider community. This has been beneficial, speedily disseminating information that can help support or undermine hypotheses. However, in the absence of peer review it is critical to maintain the high standards that we expect and have grown accustomed to in scientific research to avoid misleading fellow academics and/or the public."

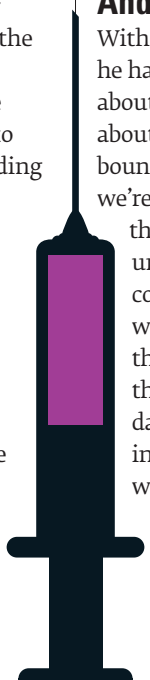
Future COVID-19 research

Faulkner anticipates that future research avenues at the Francis Crick Institute will include an undertaking to further understand how infection with one SARS-CoV-2 variant affects immunity to other variants. "This," he suggests, "is important as it will help inform vaccine design. For example, we might see a multivalent vaccine in the future, delivering protection against multiple variants in a single shot."

Looking further afield, Faulkner speculates that another key area for research that will be essential to ending the pandemic is making vaccines accessible and affordable to all regions of the world: "Developed countries must support less-developed nations battling this virus for the benefit of everybody globally. We all profit from the reduced spread of new variants worldwide"

And finally

With Faulkner's PhD nearing completion, he harbours a keen sense of excitement about what lies ahead: "What is exciting about research is that you're on the very boundary of knowledge. As researchers, we're trying to understand and discover things that nobody has achieved or uncovered before. The idea that we contribute something new to the world is inspiring, and the thought that that contribution can influence the lives of others motivates me every day. However, there is a great challenge in expanding the boundaries of what we know and understand: if the answer was easy, it would already have been answered!" TBMS

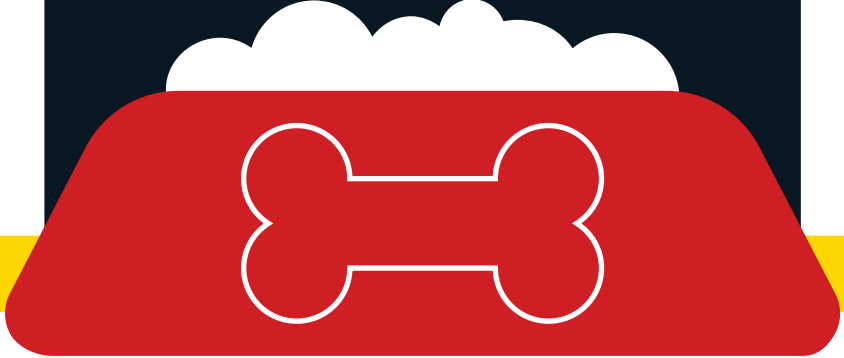


NIKHIL FAULKNER

- ✔ Undergraduate Master's degree in Biochemistry from University of Oxford, July 2017
- ✔ Awarded David Wing Prize for Excellence in Biochemistry, July 2017
- ✔ Began PhD at Francis Crick Institute, September 2017
- ✔ Awarded Sir David Cooksey Prize in Translational Medicine for work undertaken during COVID-19 pandemic, December 2020.

THE SILENT PANDEMIC

ANTIMICROBIAL RESISTANCE



Infections caused by **antimicrobial-resistant organisms** are increasing. From dog food to climate change, we look at the issues.

By now we're familiar with the projected statistic that resistance to antibiotics will cause 10 million deaths worldwide each year by 2050, if no action is taken. Research and diagnostic methods are emerging all the time to tackle global antimicrobial resistance (AMR), classified by the World Health Organization as one of the greatest public health threats.

According to some of the latest research in the field, the trend for feeding dogs raw food could fuel the spread of antibiotic-resistant bacteria in humans. Researchers at the University of Porto in Portugal found the bacteria enterococci – that can cause severe infection if spread from the intestines to other parts of the body – in raw dog food.

They analysed 55 samples of dog food (including wet, dry and raw-frozen) from supermarkets and pet shops, and found that 30 (54%) contained enterococci. Some of the bacteria were genetically identical to bacteria isolated from hospital patients in the UK, Germany and the Netherlands. Multidrug-resistant bacteria were present in only three of the non-raw samples.

More than 40% of the bacterial samples were resistant to a range of antibiotics, including ampicillin and ciprofloxacin. There was also resistance to the "last-resort" antibiotic linezolid – used for severe infections when other drugs have failed – in 23% of the samples.

"The close contact of humans with dogs and the commercialisation of the studied brands in different countries poses an international public health risk,"

RAPID ANTIMICROBIAL SUSCEPTIBILITY TESTING

The University of Bristol has been working with Vitamica – a company that emerged from the university itself – to develop diagnostic technology that can show very quickly whether an antibiotic is suitable for particular bacteria.

Rapid antimicrobial susceptibility testing (AST) of patient samples can inform doctors which antibiotics will be effective for an individual patient's infection within one hour, compared with the usual 48 hours it takes to get test results obtained from growing the bacteria. This type of AST is based on optical technology that uses lasers to detect tiny fluctuations within the individual bacteria, indicating in a few seconds whether the cells are alive or not.

"Having to grow the bacteria that cause the infection takes time, particularly for bloodstream infections where you need a test result really quickly," says Professor Matthew Avison. "We have developed a rapid test where you can take a clinical sample, stick it in a machine that shines some lasers at the bacteria. If the bacteria are alive, they are 'wiggling', if you add an antibiotic that works they stop wiggling. In a few minutes you can get a sense of whether or not bacteria are susceptible to antibiotics."

"If we do nothing then it will at some point become a much bigger deal than COVID-19"

says one of the lead researchers, Dr Ana R. Freitas, Post-doc Researcher in microbiology. "European authorities must raise awareness about the potential health risks when feeding raw diets to pets and the manufacture of dog food, must be reviewed."

Researchers at the University of Bristol also found that feeding raw meat to puppies was a big risk factor in those puppies carrying antibiotic-resistant bacteria. In their study of the transmission of antibiotic-resistant bacteria between animals and humans, they compared clinical samples from people with urinary tract infections and puppies' faecal samples, finding antibiotic-resistant bacteria that are almost identical.

"The resistant organisms that are in that dog food are actually sticking inside the dogs and they are excreting the bacteria in their faeces," says Matthew Avison, Professor of Molecular Biology at the University of Bristol. "We're concerned that what this shows is that raw feeding of your pet dog will put you and your family at more risk of being colonised by AMR bacteria."

A slow-moving pandemic

AMR is the next major pandemic, according to Dr Tina Joshi, Lecturer in Molecular Biology at the University of Plymouth. "There are a lot of parallels with AMR and COVID-19 in that we have a lot of antibiotics for AMR organisms, like antimicrobials for malaria, but there are organisms developing resistance at a phenomenal rate," she says. "AMR microorganisms are very dangerous and there are thousands of them."

There's also a "big Venn diagram" of where AMR and COVID-19 overlap, according to Avison. "Quite a number of people who die of COVID-19 will also get a secondary bacterial infection that is resistant to antibiotics. AMR is going to make COVID-19 worse, just as much as AMR makes any infection worse."

Almost every person in a country like the UK will be carrying antibiotic-resistant bacteria around with them now. "While the relative risk of those people getting an infection on a day-to-day basis is pretty low, almost all of us in our lives will get an infection from those bacteria, whether a wound infection or bacterial pneumonia or something more serious," says Avison. "The older we are the more

likely that is to happen and the more likely we will have had antibiotics, so the more likely we are to carry antibiotic-resistant bacteria. If we do nothing in terms of reducing the rate at which resistant infections rise, better diagnostics and new antimicrobials, then it will at some point become a much bigger deal than COVID-19."

Positive developments

There is a "lot to write home about", says Dr Joshi, not least the government's 20-year vision and five-year action plan to contain and control AMR and the fact the issue was actually addressed at the G7 summit in June. "[Government Special Envoy on AMR] Professor Dame Sally Davies is spearheading the changes that need to be made at a policy level and there is a global consortium of scientists and industry actively trying to tackle AMR," she says. "We have got to a point where funding is being directed to diagnostics innovation but in companies. Industry is starting to get involved."

Dr Joshi is developing diagnostics at point of care that can provide a result on a sample within the time of a GP's appointment, without too many steps for extraction and confirmation. She says a really important development is the NHS' "subscription" style payment model to incentivise pharmaceutical companies to develop new drugs. "That's fantastic because it is rationalising antibiotic use and enabling stewardship."

Avison is involved with developing inhibitors of resistance, synthetic chemicals that are designed to get into bacteria and block AMR mechanisms. The inhibitor is administered at the same time as the antibiotic to block the resistance from the bacteria and allow the bacteria to continue to work.

"That's where we've had most success in recent times, particularly against those Gram-negative bacteria," he says.

FACT FILE

- **An estimated 1900 people around the world die each day of infections that are resistant to antibiotics**
- **In the UK, an estimated 12,000 people die each year from antibiotic resistance**
- **Estimated AMR infections diagnosed in England increased by 3216 in 2019, to 65,152**
- ***E. coli* remains the most common bloodstream infection – 77.5 cases per 100,000 of the population**
- **AMR bloodstream infections have risen by 32% since 2015**
- **AMR is linked to 1 in 5 people with a key bacterial bloodstream infection**
- **Antibiotic consumption continues to fall year-on-year. In 2019, total consumption fell to 17.9 defined daily doses per 1000 people per day, compared with 19.4 in 2015.**

"They are changing the face of antibiotic chemotherapy, because they are effectively stripping out many of the problems we have with antibiotic resistance. They are more likely to be an ongoing way of combating resistance rather than the development of new antibiotics."

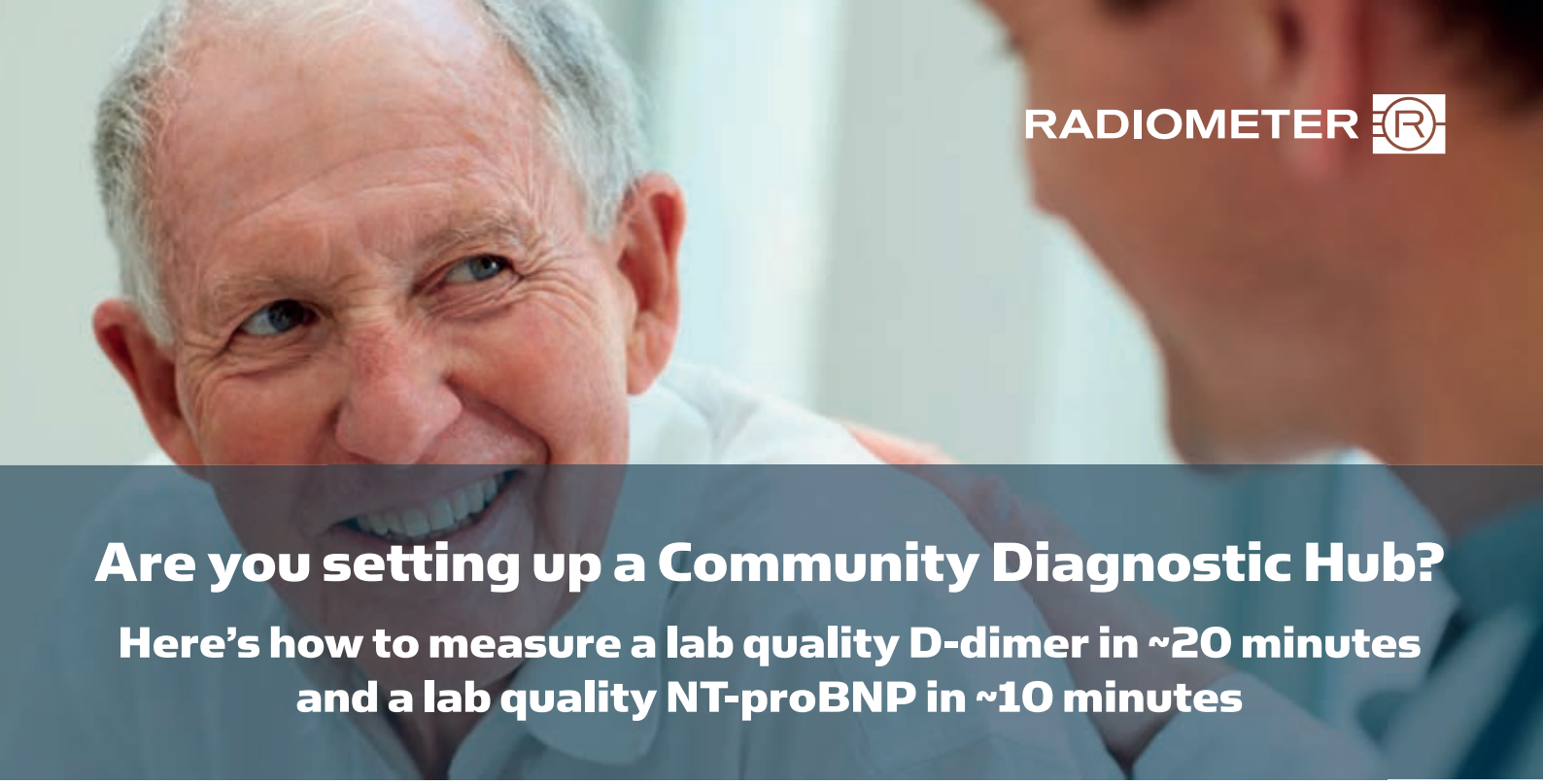
What needs to be done

This is especially important given the finite nature of antibiotics. "We always have to remember that antibiotics are natural products, they are produced by bacteria and fungi in the environment and they are literally dug out of the ground – they are not manmade," Avison says.

Dr Joshi adds: "Climate change is a huge threat to our species and it's enabling AMR and the spread of infectious diseases. The economic pipeline for antibiotic development is not viable – we have scientists and companies developing antibiotics that may be useful for last resort but, they're all getting shelved. We need change at a policy level."

She advocates governments and policymakers demonstrate clearly the links between climate change and AMR, and curriculum changes for medicine that allows for better delivery of knowledge about AMR for future doctors. "Hospitals have changed significantly because of COVID, they'll change even more significantly because of AMR," she adds. "If we implement appropriate infection control in a hospital environment, and utilise appropriate disinfectants we can stop the spread of more or less any microorganism. That needs to be reviewed because it has a very immediate impact."

Modern medical practices are underpinned by the use of antibiotics. As resistance increases and antibiotics dwindle, diagnostics and practices in medicine must change in order to reverse that projected future. BMS



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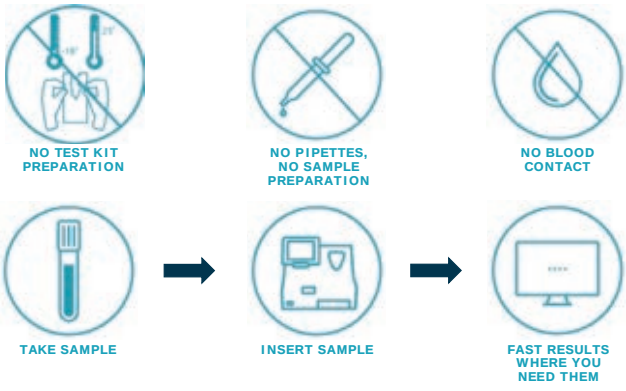

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TnT	10 – 25,000 ng/L	**	12:18
CKMB	2 - 500 µg/L	IRMM, 455	18:09
Myo	20 - 900 µg/L	Scripps, M0725	18:09
NT-proBNP	70 - 35,000 µg/L	**	10:10
CRP	5 - 500 mg/L	ERM – DA472/IFCC	20:18
ßhCG	2 - 5000 IU/L	IU/L WHO, 75/589	18:09
D-dimer	80 - 100,000 µg/L	Hytest, 8D70	20:10
PCT	0.12 - 100 µg/L (whole blood), 0.082 - 100 µg/L (plasma	**	12:11

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[1] DIAGNOSTICS: RECOVERY AND RENEWAL Report of the Independent Review of Diagnostic Services for NHS England Oct 2020

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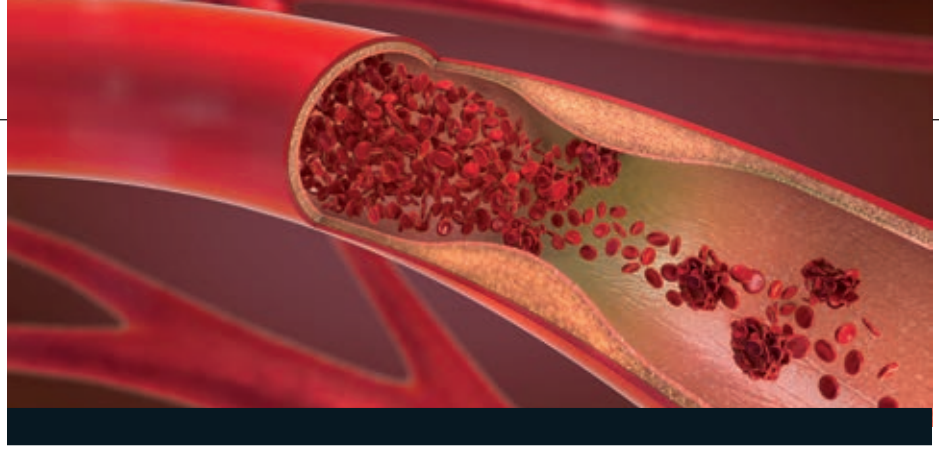
LABORATORY ERRORS IN TRANSFUSION

LEARNING FOR THE LABORATORY

Anne Lockhart, IBMS representative, and **Victoria Tuckley** from the Serious Hazards of Transfusion (SHOT) scheme explain their latest annual report.

The latest SHOT report acknowledges that 2020 has been an extraordinary year for the NHS, which has seen unprecedented pressures placed on both the staff and the service. The total number of reports included in the analysis for 2020 was 3214, compared with 3397 in 2019. The breakdown of all reports analysed and included in the annual SHOT report is available at shotuk.org.

SHOT data from 2020 show that while transfusions are generally safe in the UK, there are areas for concern where actions are urgently needed. There has been a steep increase in transfusion-related deaths reported in 2020 – 39 reported in 2020 (17 in 2019). There has been a sharp increase in deaths due to delay, 12 in 2020 (two in 2019). The risk of death related to transfusion in the UK is one in 53,193 and the risk of serious harm is one in 15,142 components issued.



KEY RECOMMENDATIONS

- Transfusion delays, particularly in major haemorrhage and major trauma situations, must be prevented. Delays in provision and administration of blood components including delays in anticoagulant reversal, particularly in patients with intracranial haemorrhage, can result in death, or serious sequelae. Every minute counts in these situations.
- Effective and reliable transfusion information technology systems should be implemented to reduce the risk of errors at all steps in the transfusion pathway, provided they are configured and used correctly.
- Effective investigation of all incidents and near-miss events, application of effective corrective and preventive actions, and closing the loop by measuring the effectiveness of interventions should be carried out to optimise learning from incidents.

KEY SHOT LABORATORY RECOMMENDATIONS

- Trust/health board governance should review staffing levels in transfusion laboratories and ensure the skill mix is in compliance with UK Transfusion Laboratory Collaborative (UKTLA) standards and that there are sufficient numbers of staff in line with capacity plan (UKTLC, 2014).
- Transfusion laboratories should have clear procedures for component selection to avoid ABO-incompatible transfusion. Complex situations should be discussed with a haematologist or UK Blood Transfusion Service Consultant for concessionary issue where time allows.
- Handover is a safety critical point in the working day. Transfusion laboratories should implement a written handover log to support clear communication.

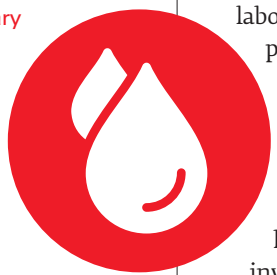
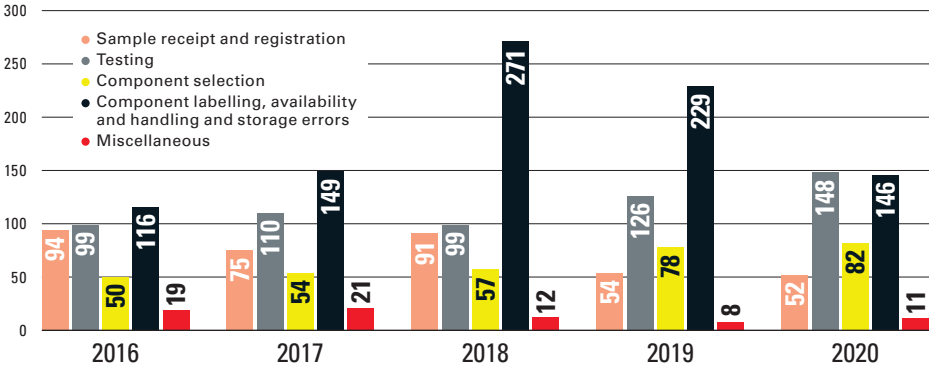


FIGURE 1: SHOT ERRORS 2016–20 CATEGORISED BY THE STEP IN WHICH THE ERROR OCCURRED



Laboratory errors

Laboratory errors accounted for 639/3214 (19.9%) of all SHOT reports in 2020, reducing from 796/3397 (23.4%) in 2019. This is possibly due to improvements in practice, or due to the unprecedented pressures faced due to the COVID-19 pandemic, leading to reduced reporting.

For the first time in several years, most laboratory errors resulted from omissions at the testing step 148/439 (33.7%), increasing from 126/495 (25.5%) in 2019. This mostly included incomplete testing prior to component release (antibody identification in particular), inappropriate use of electronic issue and incorrect interpretation or results for cell-free fetal DNA for RhD screening. There has also been a drop in component labelling, availability and HSE errors to 146/439 (33.3%) in 2020 from 229/495 (46.3%) in 2019. Figure 1 shows the pattern of laboratory reporting by step over the past five years.

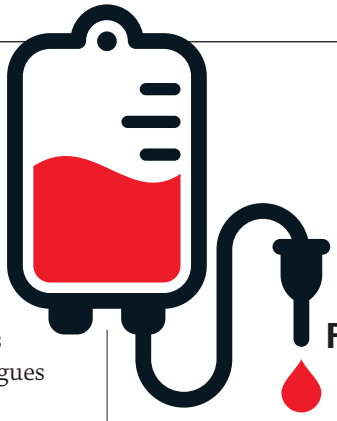
There were two deaths associated with laboratory errors possibly related to the transfusion. One case involved a patient with autoimmune haemolytic anaemia (delay involving multiple communication difficulties and no clear process for emergency red cell provision). The other involved significant delays in provision of blood, compounded by IT failures during a major haemorrhage. There were five cases of major morbidity relating to laboratory errors, all of which resulted in sensitisation to the K antigen in patients of childbearing potential.

Laboratory errors resulted in two ABO-incompatible (ABOi) transfusions in 2020. Both errors involved plasma components, occurred at component selection, and in both cases Laboratory information management systems (LIMS) flags alerting to the incompatibility were overridden.

Key SHOT laboratory messages and recommendations

Two key SHOT messages have been generated through the analysis of the laboratory errors in 2020:

- K-negative units should be provided to K-negative individuals of childbearing potential. Failure to do so puts future pregnancies at risk. LIMS rules, which cannot be easily overridden, should be implemented to aid this process.
- If in doubt, ask the right person for the right advice. SOP should include sufficient information and escalation procedures; however, it is in the interest



of patient safety to check details of procedures with senior colleagues rather than assume.

The SHOT report notes that overall themes seen in laboratory errors remain unchanged, however, the impact of IT is even more pronounced. Errors are compounded by staff performing workarounds, not following procedures when faced with staffing challenges and working autonomously with little experience. Training provided to newly qualified staff must provide a safe and strong foundation, which can then be built upon to create the expert scientists of the future.

An antenatal booking group and screen for a patient in her 30s at 16 weeks' gestation revealed a positive antibody screen. The sample was sent to the reference laboratory at the Blood Service for antibody identification and titration. Two antibodies were confirmed, anti-K and anti-Fya, both with high titration levels. On investigation by the hospital transfusion laboratory, it was found that this patient had been transfused one of two units of red cells issued in 2014 during a postpartum haemorrhage. The unit transfused was found to be K-positive and Fya status was not known. Alloimmunisation is a risk with all transfusions, and every effort must be made to prevent this, when possible. In this case, the formation of anti-Fya was not preventable, however, the formation of anti-K was. All K-negative patients with childbearing potential (<50 years old) must be transfused with K-negative red cells, except in concessionary cases.

Many cases reported this year have the same underlying features around inadequate systems to stop the inappropriate selection and issue of components, especially where incomplete/inadequate testing has occurred. LIMS must alert staff about specific requirements, and alerts must be heeded when issuing units.

IMAGES: ISTOCK

Future horizons

In 2019, laboratory staff were already working within high-pressure conditions (staff turnover, departmental organisation, and introduction of new technologies). This has only deepened over the past 12 months.

The SHOT Laboratory Working Expert Group acknowledges the challenges faced by staff and extend huge appreciation to all staff working in laboratories for their commendable effort during this very difficult year. SHOT continues to support reporters and their vital work improving safety. The following projects and resources aim to support this work:

- In 2020 the SHOT UK Collaborative Reviewing and Reforming IT Processes in Transfusion aimed to begin a constructive dialogue between transfusion departments and IT providers, identifying the support required by transfusion experts to improve patient safety. SHOT distributed an initial survey to all registered reporters via email.
- The SHOT/UKTLC capacity plan should be used in conjunction with local process and can provide a guide to developing a capacity plan in line with UKTLC standards.
- SHOT analysis of all laboratory incidents reported from 2015 to 2019 showed that 5.0% involved the handover process. It is essential that accurate and timely information is communicated to ensure continuity of care.
- Transfusion Laboratory Errors video – a summary of common themes in errors.
- An illustrative example of application of human factors models in incident investigations.

The above resources are freely available at the SHOT website and through the SHOT App, which is available on both Apple and Android systems (search "SHOT UK"). The *2020 Annual SHOT Report* (2021) can be read in full at **shotuk.org/shot-reports** BMS

KEY SHOT LABORATORY LEARNING POINTS

Training and development

- The competency assessment of biomedical scientists working in transfusion should include an understanding of requirements for irradiated components. Staff should also be aware of when to discuss with clinicians if the correct specification has not been requested.

Information technology

- The laboratory information management system (LIMS) should be able to prevent component issue, especially electronic issue, until all relevant testing is complete without anomaly. If this is not possible then a robust procedure must be in place to ensure that all steps of testing, component selection and issue are completed and appropriate, for example having additional checks.
- If a LIMS cannot determine eligibility for electronic issue, then this should not be used to issue red cells.
- Consideration should be made to ensure the labelling process is robust, with appropriate checks as required to ensure the correct label is on the component pack.
- Information technology solutions for label verification should be used wherever possible.

Knowledge and skills

- All clinically relevant information should be taken into account at the sample receipt and registration stage of the laboratory process.
- Patient records must be kept up to date.
- All relevant transfusion history must be available to laboratory staff to aid with the decision-making process.
- Stop and objectively review all component labelling prior to release to the clinical area. Never assume, and always check previous steps have been performed correctly.

SURVIVING THE ARCTIC

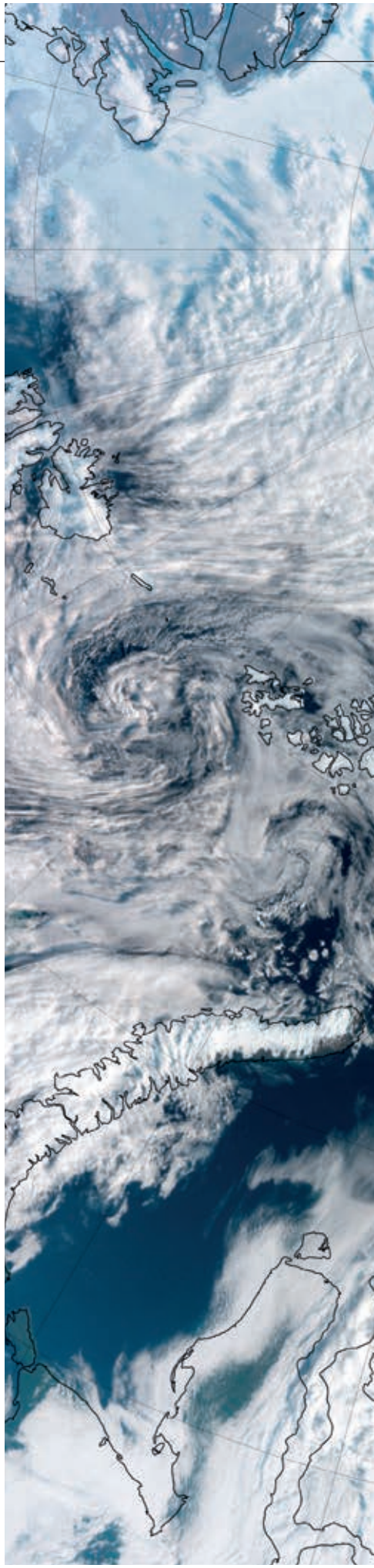
From chewing on pine cones to hair lice walking on eyeballs, **Stephen Mortlock** looks back over the medical history of the frozen north.

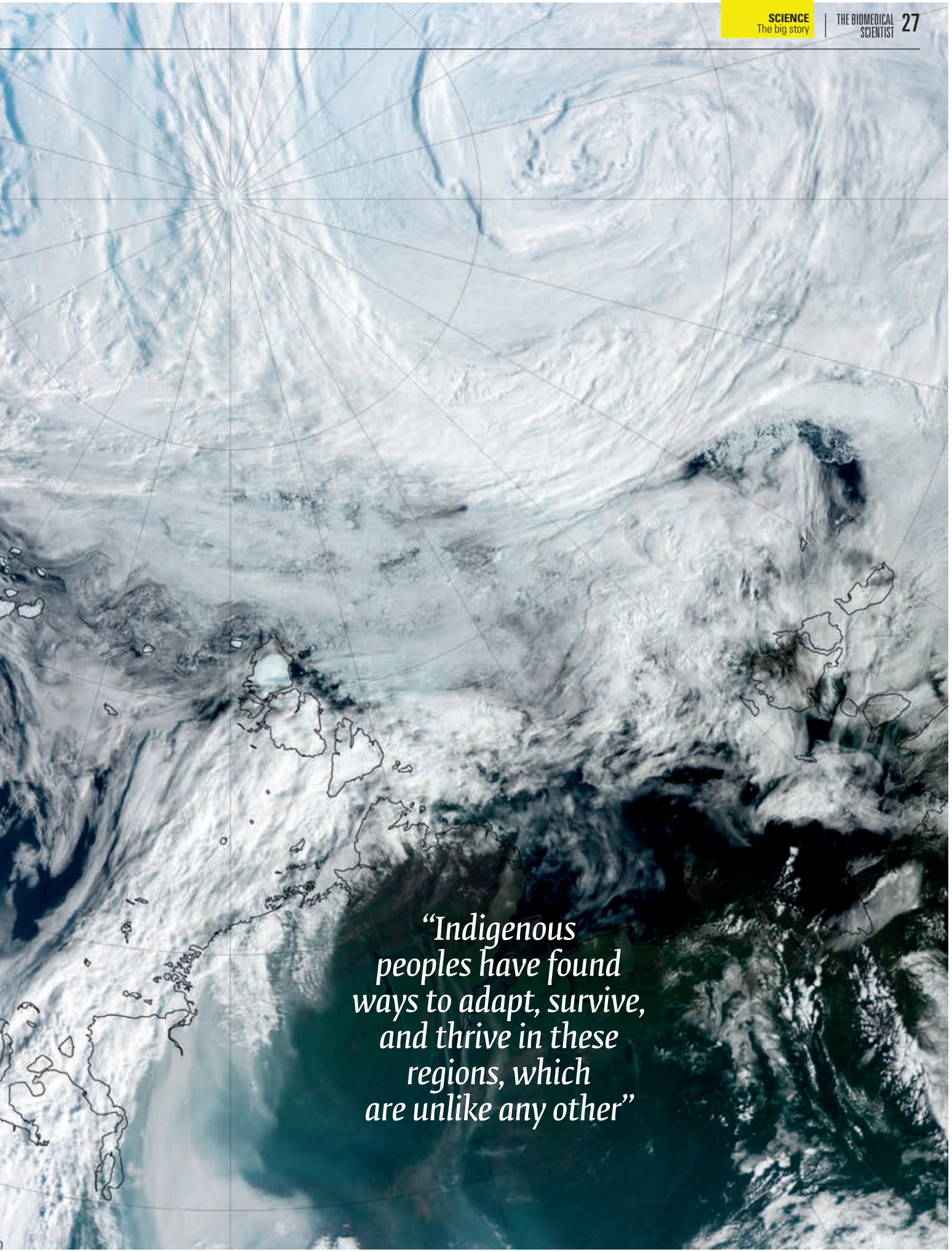
The north polar regions can be harsh, forbidding places – Arctic temperatures and strong storms blow across the ice, causing extreme wind chills, making it dangerous to venture outdoors and travel difficult without proper clothing. The Arctic has long, cold winters (January temperatures range from about –40 to 0°C and may drop to below –50°C), and short, cool summers (average July temperatures range from about –10 to 10°C). The Arctic icecap is a 6,000,000 mi² frozen ocean. Despite everything, indigenous peoples have lived in the Arctic for thousands of years and have found ways to adapt, survive, and thrive in these regions, which are unlike any other.

Solidified sea

The Arctic Circle passes through the Arctic Ocean, the Scandinavian Peninsula, North Asia, Northern America, and Greenland. The land within the Arctic Circle is divided among eight countries: Norway, Sweden, Finland, Russia, the US (Alaska), Canada (Yukon, Northwest Territories, and Nunavut), Denmark (Greenland), and Iceland (where it passes through the small offshore island of Grímsey).

Around 325 BC, the Greek geographer, explorer and astronomer Pytheas of Massalia (350–285 BC) undertook a great voyage to northwestern Europe taking in modern-day Great Britain and Ireland but, more importantly, contemporary records seem to suggest that he was the first known scientific visitor to see and describe the





"Indigenous peoples have found ways to adapt, survive, and thrive in these regions, which are unlike any other"

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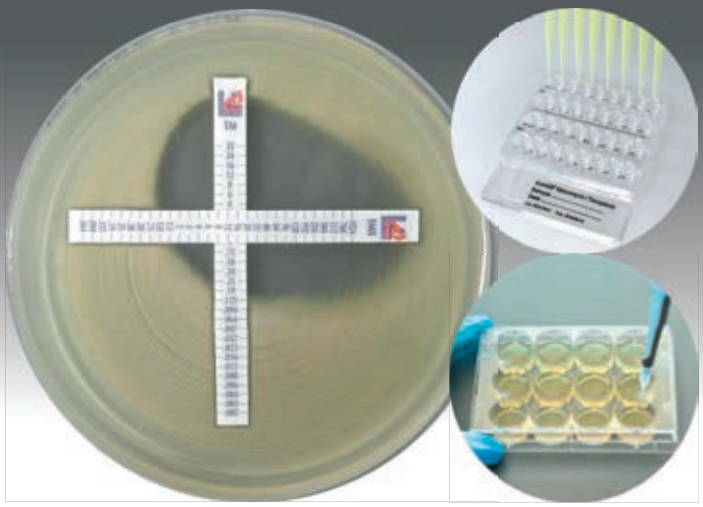

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Arctic and polar ice (pepēguia thalatta, "solidified sea"). The term "Arctic" comes from the Greek word arktos (ἄρκτος), or bear, so it is likely that this translates as the northern lands near Ursa Major.

Sailors at that time used the constellations of the northern sky, primarily Ursa Major and Ursa Minor, to aid them with orientation during their voyages. Greek scholars also theorised that in order to balance the world, there should be a similar cold Southern landmass that was the same but the opposite "Ant Arktos" – or opposite the bear.

Vikings sailed to the Arctic and settled in Iceland about 1150 years ago and, in the process, discovered the key to the New World. In the 860s Gardar Svavarsson set sail for the Hebrides but a storm blew his ship northwards and led to him becoming the first person to circumnavigate Iceland. He went ashore at Skjalfandi and founded a house at Husavik, establishing the chiefdom of Norðland. Another storm blew Gunnbjörn Ulfsson off course while he was trying to sail from Norway to Iceland and he ended up within sight of the Greenland coast. But it was the red-faced, red-bearded Viking known as "Eric the Red" (950–1003 AD) who set up a colony in 985 AD on this island and gave it the attractive name of Greenland to lure land-hungry people. While they flourished initially, these settlements eventually foundered due to changing climatic conditions. They are believed to have survived until around 1450.

"Contemporary records seem to suggest that he was the first known scientific visitor to see and describe the Arctic and polar ice"

In the 12th century, Russia began exploring and colonising parts of northern Siberia. By the end of the 17th century the whole vast territory was part of the Russian empire. From the 1500s, European explorers travelled further and further north, claiming land.

First inhabitants

In 2012, Russian scientists discovered the cadaver of a young bull mammoth preserved in permafrost on the steep shore of the Siberian Taymyr Peninsula and determined that the animal had been slain by humans around 45,000 years ago. This was 10,000 years earlier than people were previously believed to have been present in the Arctic. These prehistoric Arctic hunters, however, hunted more than mammoths. Near the Jana River, about 1700 kilometres to the east, scientists found the remains of several bison, woolly rhinoceroses and the bones of a wolf. These animals were slain by humans about 29,000 years ago. These two excavations prove that modern humans must have roamed extensively in the Siberian Arctic during the Paleolithic and early Mesolithic periods. But where did they come from? According to archaeologists, the first inhabitants of the Arctic came from Asia, reaching Alaska and Siberia via the Bering strait, which was completely dry at the time. These people then dispersed across the North American continent and spread out throughout the entire Arctic. Most were nomadic or semi-nomadic, while some of them hunted and fished; others bred herds of reindeer, with which they used to migrate. They moved into areas in the north of the Arctic Circle during the summer, then retreated southward again with the onset of the cold season. Climate data from that period suggest that the average temperatures in the Arctic were somewhat less harsh than today.

Establishing settlements

On their expeditions, the prehistoric hunters probably followed the banks of rivers, which were also followed by the animals

IMAGES: GETTY/ALAMY/ISTOCK/SHUTTERSTOCK

of the steppes on their northward migrations. The animals found abundant grazing areas and water in the river valleys. The favourite prey of the early Arctic inhabitants were mammoths, reindeer and horses. Experts believe that it was the ability of the hunters to track the great mammals that made man's initial advance into the Siberian Arctic possible. After the end of the last glacial period, the inhabitants of the Siberian Arctic region learned to make more sophisticated tools and weapons. They began to fish, catch birds, and even hunt whales and seals off the coast. They had sufficient food and were able to become sedentary, establishing settlements and enlarging their family groups.

On Zhokhov Island, in the Siberian High Arctic, researchers have found evidence of some of the most remote prehistoric human occupation in the world – a settlement where they believe 25 to 50 people permanently lived around 9300 to 8600 years ago. They survived frigid year-round temperatures in animal-skin tents some 500 kilometres north of what is now the Russian mainland. They are the only people ever known to hunt polar bears without firearms. The scientists found hunting weapons, parts of sleds and home utensils made of stone, bones, horns, tusks and wood. Scientists also found the bones of medium-sized canids living with the inhabitants of the Zhokhov site, which are similar in size and body weight to modern sled dogs. Given that the researchers found parts of sleds including runners could show that the inhabitants of this settlement had a transport system enabling them to travel to the nearby territories and maintain relations with their neighbours.

These findings also shed new light on our knowledge about the evolution and dispersal of modern man, *Homo sapiens*. Assuming, as some researchers do, that *Homo sapiens* left Africa, the continent of origin, for the first time only 65,000 to 50,000 years ago, the long and arduous migration to the north only took a few thousand years, which is remarkable.

Traditional methods

Early Inuit medicine was "folk" medicine, which means that knowledge about treatments and cures was a shared knowledge passed down from generation to generation. Every Inuit knew the rudiments of traditional medicine, which were typically based upon that most common resource: animals, fish and birds. Numerous traditional treatments utilised skins, fats, sinews and oils from a wide range of creatures. The neck skin from a ptarmigan (*Lagopus muta*) was prized as a light dressing to cover cuts and burns, and the thigh skin could be applied to a boil. Raw ptarmigan breast meat was given to chronically ill people who had lost their appetite, and it was used in thin slices on boils, on the neck (for a sore throat), or on the eyelids for snow blindness. Ptarmigan down mixed with rancid seal fat, or just raw ptarmigan oil, can be used to treat a cut. A treatment for people with tuberculosis was to eat a whole raw common loon (*Gavia immer*), and this remedy could also be used for asthma, seizures, or children who had fainted during a fit. Dried loon intestines would be chewed to relieve a stomachache. Goose (*Anser caerulescens*) oil was used raw on cuts, and the thinner bone of a goose wing can be hollowed out and used as a "straw" to help extract pus from a boil. Raw owl oil was used on cuts and impetigo, and the skin from a black guillemot (*Cepphus grylle*) used to clean the inner eyelid. Wing feathers of any bird are useful. The outer (soft) end of a feather is used as a dropper (it is sharpened first) or used to test the temperature of boiling oil; if it burns, the oil is ready to use.

Contrary to popular belief, seal blubber and meat, although highly nutritious (<2% fat), is not widely eaten, however, seal fat has been called the "natural penicillin" of the North and is used more than any other animal or plant part in traditional medicine. It can be used raw, boiled or even rancid. Though the species of seal is not usually important, bearded seal (*Erignathus barbatus*) fat seems to be preferred. Generally, one uses fat from a male seal on women and female seal fat on men. Raw seal fat is often used to treat skin ailments. Applied in thin slices or rubbed in, it is effective on cuts, burns, wounds and impetigo, and helps stop bleeding. Raw seal fat can also be chewed

(for a sore throat) and used in drops (in the eyes for snow blindness and in the ear for earache). Seal fat can also be boiled, sometimes until it is black, with the belief that "the longer you cook it, the stronger it gets". Boiled fat can be preserved by putting it in airtight animal parts (stomach, throat, flippers) and storing it in a cool place. Taken internally by the spoonful, this fat is used as cough syrup and to ease breathing. Rubbed on the skin, sometimes mixed with some Labrador tea, it is used for treating frostbite, chest colds and general aches.

Sinew, taken from around the spine of a caribou (*Rangifer tarandus*), is shredded, cleaned, dried and used as a thread for sewing up large cuts, for pulling out loose teeth, for clearing a blocked urinary tract (in which case it must first be twisted into a long stiff piece, and then greased with seal fat), and used to bring pus to the surface of a boil. Caribou fat is chewed and placed on cuts (to help stop bleeding) or on boils and infections. Small slivers of fat can be inserted into the rectum to try and relieve constipation.

And not forgetting our invertebrate friends. Hair lice can be tied with a length of hair and made to walk on an eyeball affected by snow blindness. The insect's sticky legs pick up the white film that develops on the eyeball. Flies may also be used in this manner. Codfish lice, which attach themselves to the outer skin of the fish, are peeled open; inside is a gum-like substance that is flattened and used on cuts.

"They began to fish, catch birds, and even hunt whales and seals off the coast"

Maggots, which must be obtained from meat and not rubbish, are sometimes placed in a boil after it has been drained in order to "eat out" any remaining pus. Maggot debridement therapy has been used for centuries and has been revived recently.

Herbal knowledge

The Inuit people were traditionally not just a little nomadic, but nomadic over almost incomprehensible distances – which is why "Eskimoan" circumpolar cultures can pretty much understand each other's languages.

Secondly, the Arctic landscape varies greatly, causing the available plant life to do likewise. In other words, unlike in the South, there was little consistency in the types of plants Inuit were able to access. And consistency – predictability – is what survival is based upon.

Yet the Inuit possess area-to-area variations for herbal knowledge, just as the plants they could find varied. Inuit living near the tree line could access pine trees and people use either the inner layer from near the tree's base or from a branch; it is said that older branches are darker and contain more oil. It is claimed that the best inner bark comes from the tip of an older branch, and is used on cuts, boils and infections. They could gather juniper berries, known for their antiseptic properties, as well as their utility in treating kidney and bladder problems, gas and mild infections. The white inner layer of bark is peeled from the larch tree (*Larix gmelinii*), boiled (for a day) and powdered to use on a boil, boiled into a general medicinal tea, or chewed like gum for a cold.

Pine tree gum is chewed to soften it and then placed on cuts or burns to heal and help soothe pain. Toothache can be soothed by biting on a pine cone; this also helps to suck out any dirt or abscess causing the pain. Chewing on a pine cone fights mouth infections, it is claimed, and the cones can also be used to make a tea to treat skin infections.

Even Inuit without access to the tree line still had many uses for the plants available to them. One of the most important plants was Arctic cotton grass (*Eriophorum callitrix*). This plant is food for migrating snow geese and caribou.

The Inuit used the seed heads as wicks in oil lamps. Clumps were stuffed into babies' pants and then thrown away when soiled. The oil from the stem was used to remove warts. The cottony head of the plant makes an excellent all-purpose swab. A mixture of cotton grass and charcoal makes a good temporary wound cover.

There were numerous other plant medicines, as well. Freshwater algae, boiled first, was used for just about anything relating to the skin, from boils to impetigo. Moss not only made a good lamp wick, but was used for extreme snow blindness, skin problems, frostbite and wound dressing. Fireweed (*Chamerion latifolium*) leaves were used to help stop nosebleeds. Dwarf willow roots were peeled and held against a sore tooth. Various types of mushroom were used externally for cuts and frostbite (not to mention shamanistic rituals). Mountain sandwort, called the "lettuce of the Inuit", is found on beaches and is eaten raw to try and relieve diarrhoea.

Inuit tea

More often than not, the Inuit used plants as tea, and various tea recipes have existed across the Arctic since time immemorial. Tea drinking was both recreational and medicinal, but the former at least explains the unusual Inuit fondness for store-bought (i.e. Asian) tea. Fireweed has always been one of the most popular teas for universal intestinal complaints (everything except the roots is boiled), although Inuit and other cultures found it useful for myriad things, including: muscle spasms, nervous irritation, irritation of the mucous membranes, regulating menstruation, and healing sores and blisters (as an external balm). Cloudberry leaves (*Rubus chamaemorus*), bearberry leaves and alpine smartweed (*Polygonum vivaparum*) were used for general stomachaches and kidney problems. Bearberry (*Arctostaphylos uva-ursi*) tea, in particular, has strong diuretic and astringent properties, and is said to be good for bladder troubles. Rock tripe, a kind of black lichen, can be boiled and the tea is drunk to treat tuberculosis.

The most widely ingested tea, however, is Labrador tea, made from three closely related plant species in the genus *Rhododendron*. The entire plant (especially the leaves) is rich in a pungent, volatile oil called ledol ($C_{15}H_{26}O$), which can cause cramps, paralysis, and delirium. The more it is steeped or boiled, the more ledol is released. A strong wash of it can remove lice or other skin parasites. It does have a reasonably strong sedative effect, and shouldn't be used by people prone to heart problems and seizures. If someone is unused to it, it can cause giddiness and lightheadedness at first, but the body quickly acclimatises to it. Medicinally, Inuit most often took it to relieve stomach problems, mild constipation, rheumatism and fever.

Conclusions

For centuries, the Inuit people have survived in the roughest environments. They know the weather patterns that allow them to travel safely on the sea ice for their hunting expeditions. But climate change is having an effect, the glaciers are melting more in summer than previously and the routes to traditional hunting spots have become precarious. What was once familiar territory has become unstable, making navigating and travel dangerous. The effects of Arctic warming have found that temperatures increased by 2–5°C over the last 50 years and may rise by yet another 10 degrees.

As the hunting has declined, more family members are settling in permanent communities and taking less active, paying jobs to earn money for store-bought products, but the downside is that they are starting to lose their knowledge of traditional skills, such as sewing animal skins or hunting. This move from a hunting-based lifestyle has also caused many Inuit to switch from a traditional diet of fish or caribou to store-bought food, rich in fats and sugars.

Unfortunately, as the diet, lifestyles and environment have changed, so too have the major determinants of health among the Inuit, with a pattern of increasing obesity and chronic disease, such as diabetes and cardiovascular disease, while accidents, suicides, violence, and substance abuse are becoming increasingly prominent in Inuit communities.

But, there is a growing awareness of the rights of indigenous people, such as the Inuit, to preserve their centuries-old way of life. There are calls for increased environmental monitoring in the Arctic regions because what happens there may easily be a forecast for what will occur around the rest of the world. Awareness of the Inuit culture and their environment will not only benefit their survival, but may ultimately help the whole planet. BMS

Stephen Mortlock is Pathology Manager at the Nuffield Health Guildford Hospital. To view this article with references, visit **thebiomedicalscientist.net**

A vital leap forward in cardiac testing

Speed meets accuracy where it matters most – the wait is over for hs-cTnI at the point of care.

When ruling out a potential myocardial infarction (MI), every minute spent waiting on test results comes at a cost. Patients and their families are anxious, and clinicians and laboratory professionals are pressured to identify the problem quickly and accurately. Increased time to results adds congestion to an already busy emergency department. But what if ED staff had access to high-sensitivity troponin right at the point of care?

Consider the value of adding a new tool at the clinician's disposal that can provide high-sensitivity troponin I (hs-cTnI) results in just 8 minutes from a single fingerstick and patient interaction. The solution is intuitive, easily integrates into the existing workflow, and gives laboratory partners centralised control over decentralised testing, so ED throughput can be improved for efficiency and confidence.

The Atellica® VTLi Patient-side Immunoassay Analyser, powered by Magnotech® Technology, will transform your chest pain assessment process to benefit patients, clinicians, and your operational workflow. Because when it comes to assessing patients with symptoms of an MI in the ED, trust, time, and resources aren't just valuable – they're vital.

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THE SHADOW OF THE PANDEMIC

REDEFINING THE WORKPLACE

Last autumn Specialist Scientific Lead **Azuma Kalu** wrote an article on pandemic pressures in the lab. A year on, he revisits the subject.

At the start of the pandemic, the priority given to employee safety and wellbeing led to the changes in workplaces. The emphasis on remote working meant that those who could work from home were supported to do so. Additionally, those who were deemed to be vulnerable were required to self-isolate.

The reduced number of staff meant that pressure was placed on the available staff to cover the shifts, with the resultant impact on their health and wellbeing.

Bearing the burden

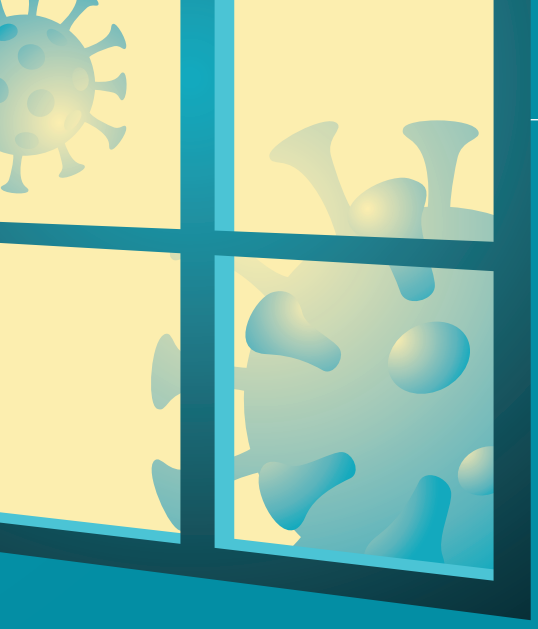
In clinical laboratories, most of the jobs with scope for remote working are the more senior roles that involve result reporting or documentation and could primarily be performed remotely on computers. While the better-paid managers have been able to work from home, making savings on daily transportation cost, low-level staff, such as medical laboratory assistants, who have to receive and book in specimen requests, and the junior scientists who perform analyses daily and cover the out-of-hours services, all of whose jobs require them to be physically present, have had to bear most of the burdens of keeping the services running. There has also been the added task of scanning and emailing of results and worksheets ready for reporting, performed by the junior scientists for the more senior scientists working from home.

As the pandemic restrictions are lifted, with the expectation that services will begin to return to normal, there is now a resistance from many senior scientists and managers to return to office working. Certainly, there are administrative roles that can be performed remotely, but the argument for a senior scientist whose duties, among others, requires training and mentorship of junior staff to continue to resist a return to the laboratory rests on shaky grounds. For many junior staff, the physical presence of their senior colleagues is a demonstration of commitment to the wellbeing of the entire workforce, and this comes from the knowledge that face-to-face contact creates rapport and trust, while training and mentorship is best achieved when you can physically build a relationship.

Long-term remote working may have some negative effects on the delivery of training, especially for new or inexperienced members of staff, and thus impact on career development. Also, it has been known to extend the workday, blur the boundaries between work–life balance, and has the potential to increase stress thresholds and ultimately have a negative impact on mental wellbeing. Therefore, for those roles that are adaptable to remote working, organisations should strive to strike a middle ground and adopt a hybrid approach, which combines remote working days and office days as a more sustainable new normal.

The challenge

The pandemic has brought untold hardship to many people and changed their lives forever. Many staff have lost loved ones and, in some cases, were not able to say goodbye. Some have family members who have lost their jobs or their job prospects. Financial worries have also ranked high as one of the consequences of the economic stagnation occasioned by the pandemic. Equally, there are still some who have endured significant isolation for these long months and cannot bear it any longer. For each of these people, there is a void, a pain, an anguish, which can easily morph



into a psychological trauma. It is always easy to suppress such feelings and the longer it is bottled up, the more it develops into a more serious condition. Each of these people comes into the laboratory burdened with worries and any additional stress can easily exacerbate their situation.

As expected, the sample numbers are steadily building up again and staff shortage is becoming a recurrent denominator. Many laboratories are already reviewing their COVID-19 policies to make it more adaptable and applicable to their current circumstances, however, any anticipated improvement will be handicapped by non-availability of staff. One of the things that might be helpful to the long-term sustenance of the laboratory is for the managers to carry out a skill mix review. This can go a long way in improving the resilience of the laboratory as we come out of the pandemic.

Keeping up with the routine tasks associated with quality management and continuous accreditation are the usual casualties whenever staffing levels are low and this has been prominently shown to be the case during the pandemic. As sample numbers begin to increase, managers face a difficult choice of meeting the service obligations with the available staff without compromising their commitments to their laboratories' continuous accreditation requirements.

As more staff gradually return to the laboratory to work, organisations should implement better employee engagement practices, as these promote more openness and better communication, both of which are critical to the success of any organisation. Also, managers should of necessity begin to provide support for staff affected adversely during the pandemic to undergo mental health assessment. This will promote a positive mental health attitude in the team and lead to a healthier, more creative, more productive, and responsive workforce.

The opportunities

The pandemic has offered many scientists the opportunity to learn new skills, cross-train in different specialities and develop new behaviours that have improved the services their laboratories offer. E-learning courses may have been available prior to the pandemic, but there was always preference for in-person workshops and seminars, however, that has now changed during the pandemic with many staff attending virtual training and e-learning courses. This trend is going to be the new normal and an integral component of staff training and development. This presents organisations an opportunity to reduce their employee training costs.

Access to advanced technology has also promoted flexibility in working patterns for those staff whose job roles lend themselves to remote working. For such staff, having the option to work some days from home has made a lot of difference to their personal lives and improved their productivity. BMS

Azuma Kalu is a Specialist Scientific Lead in Specialised Clinical Chemistry at Sheffield Teaching Hospitals NHS Foundation Trust. To listen to Azuma discuss mental health and workplace pressures, listen to episode 11 of the podcast IBMSpod, available soon at **ibms.org/resources/podcasts/ibmspod**

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HISTOPATHOLOGY SCIENTIST TRAINING

Jo Horne and **Chris Fisher** give a nuts-and-bolts guide to the new Histopathology Scientist Training Programme.

Traditional scientific training in histopathology leads to roles such as general management, quality management and training. Changes began in the early 21st century, with the formal development of simple and complex specimen dissection training roles, as well as the more recent introduction of national histopathology reporting programmes, leading to consultant roles for scientists in histopathology. As part of wider healthcare science training, the National School of Healthcare Science (NSHCS) oversees a variety of qualifications for healthcare scientists across 52 specialties, including the Scientist Training Programme (STP).

What is the histopathology STP?

The histopathology STP is a fully funded three-year programme of workplace and academic study, including a Masters degree in cellular science from Manchester Metropolitan University.

The STP histopathology curriculum has been updated for the next decade, to reflect the rapid changes in histopathology, including the expansion of molecular testing and digital innovations. The aim of the new curriculum is to develop healthcare scientists with knowledge and skills in a range of areas, to then act as a platform into more senior roles, dependent on professional interest and local service need.

Specialty training

The first year of the programme includes rotation modules introducing histopathology, diagnostic cytopathology and cancer genomics. A new digital, data and technology module has been included, introducing the trainee to principles around the digital innovations that are increasingly important in histopathology.

The remainder of the programme comprises the specialty histopathology modules and a project, as well as the opportunity for the trainee to explore a personal development goal.

Specimen dissection

The non-malignant specimen dissection module covers five high-volume, low-complexity specialisms encountered in most histopathology departments (skin, gastrointestinal, gynaecology, urology and breast). This module focuses on gaining experience in basic dissection, with practical competencies signed off locally. The module content mirrors the themes in the IBMS Diploma of Expert Practice in

IMAGES: ISTOCK

Histological Dissection (DEPHD) qualification, although not to the same level of depth. The prior learning and documentation gathered during the STP can be used to form part of the DEPHD portfolio after programme completion.

The malignant dissection module introduces dissection of malignant specimens. Again, it focuses on dissection of skin, gastrointestinal, gynaecology, urology and breast specimens, which should be seen in most histopathology departments. It is an introduction to complex specimen dissection, with any practical competencies signed off locally.

Career options

The revised curriculum places a greater focus on specialised immunohistochemical and molecular testing pathways. This provides STP graduates with the transferable skills to move into senior scientist roles within these areas, providing scientists in histopathology with opportunities to expand their careers outside of dissection and reporting. There is also greater focus on developing some of the more strategic and business skills relating to service management, required of all senior scientists working within histopathology.

"This provides graduates with transferable skills to move into senior scientist roles"

After completing the STP, graduates may wish to register as a clinical scientist with the HCPC, however, there is no requirement to do so if they hold existing registration as a biomedical scientist.

Benefit your department

STP trainees are supernumerary and fully funded. It is a good way to increase staff and plan a robust multi-skilled histopathology workforce. We know we will require many more scientists to undertake ever-expanding specimen dissection, histopathology reporting and molecular pathology testing and interpretation, alongside our medical histopathologist colleagues.

The STP provides transferable skills and knowledge that can be applied across histopathology. To further a career in dissection and reporting, scientists will be able to undertake the IBMS/RCPath DEPHD qualification in the year following completion, which is a nationally recognised, transferable dissection qualification within the UK. Trainees can also undertake complex dissection and histopathology reporting qualifications, with the possibility of a more modular approach in the future as these qualifications continue to develop alongside service and workforce need.

The histopathology STP will give a good grounding in molecular pathology and cancer genomics, so scientists may wish to then develop in this area, undertaking other qualifications in cancer genomics.

Scientists with an interest in digital technologies may wish to develop roles here, accessing further qualifications in these fields. Scientists may also wish to develop additional management and leadership skills and can follow this more traditional career pathway in cellular pathology into management, or use them to support their professional development as a senior scientist in a more clinical or scientific role.

Host an STP trainee

Over the next few months, managers and clinical leads of cellular pathology departments across England will need to express interest in hosting an STP trainee.

There are two routes to host a trainee, firstly, in-service, where the prospective trainee is already employed by the department that wishes to support their entry to the programme. Secondly, direct entry, where a trainee is recruited to post via a national recruitment scheme. In-service entry is a great option for biomedical scientists looking to further their skills, knowledge and career options. Expressions of interest will be open until October 2021. If you would like to host a trainee contact your local HEE office. More information is available on the NSHCS website (**bit.ly/3fA3Spo**). The NSHCS will also be hosting drop-in sessions to support you through this process (**bit.ly/370Cea6**).

How can you apply?

The histopathology STP is accessible by anybody who holds a life science degree (class 2:1 or above). You do not need prior registration with the HCPC to apply.

If you are currently working in histopathology, speak to your department about in-service application. Applications for direct entry posts for September 2022 open in early 2022, with interviews taking place in early summer (**bit.ly/3Cpq5ji**). BMS

Dr Jo Horne is Lead Editor of the STP Histopathology Curriculum Review and **Chris Fisher** is Curriculum Manager at the National School of Healthcare Science.

Menarini Diagnostics launches HistosMATE: the unique cleaning system for wax contaminated tools

Safety and productivity in the histopathology lab

We are excited to announce the expansion of our comprehensive instrument range with the new fully automated cleaning system HistosMATE for wax contaminated tools. This unique offering to the market will increase lab productivity and safety. HistosMATE is a compact unit that is extremely easy to use and will clean your moulds, racks, forceps and other wax contaminated tools in only 7 minutes using the ready to use and eco-friendly MileGREEN reagent. MileGREEN is a safe noncarcinogenic isoparaffin solution that replaces xylene, a known hazardous substance for the human nervous system.

The tedious and time-consuming task of cleaning wax contaminated items manually can be avoided with HistosMATE and this will contribute to a leaner workflow in the lab and eliminate tissue carry over. Additionally many histology labs use their current tissue processors to clean racks and other wax contaminated tools. This process is slow but also leads to increased wax residues build up in the processing retort and may impact your tissue processor reliability.

The cleaning process on the HistosMATE is very simple. The operator loads the items into the basket, shuts the lid and presses 'START' on the touch screen terminal. In just 7 minutes, an acoustic signal marks the end of the cleaning cycle. The reagent is constantly stirred and kept at 50°C, before heated up to 60°C during the cleaning process. 20 cleaning cycles can be performed on HistosMATE before any reagent exchange is required.

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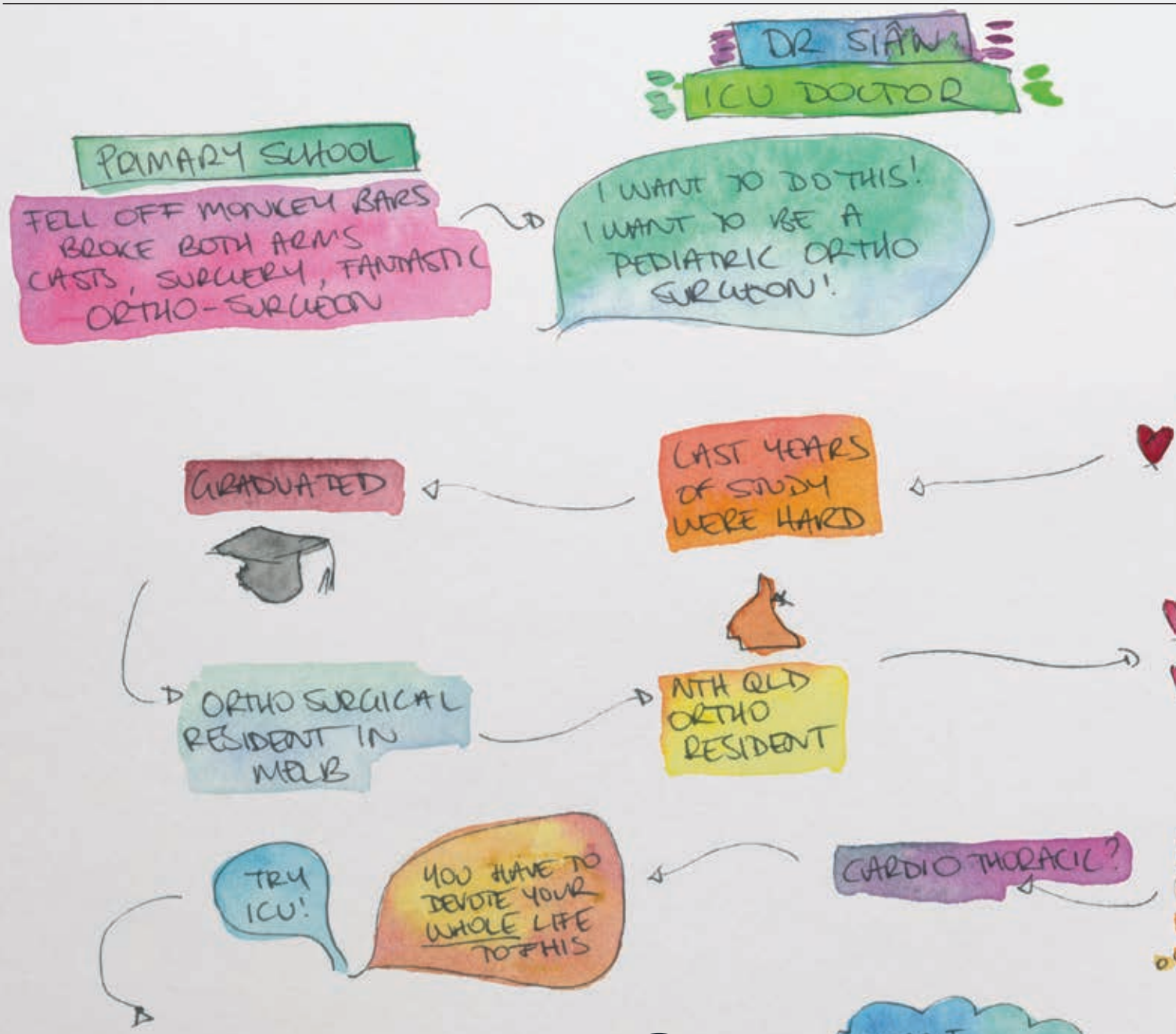
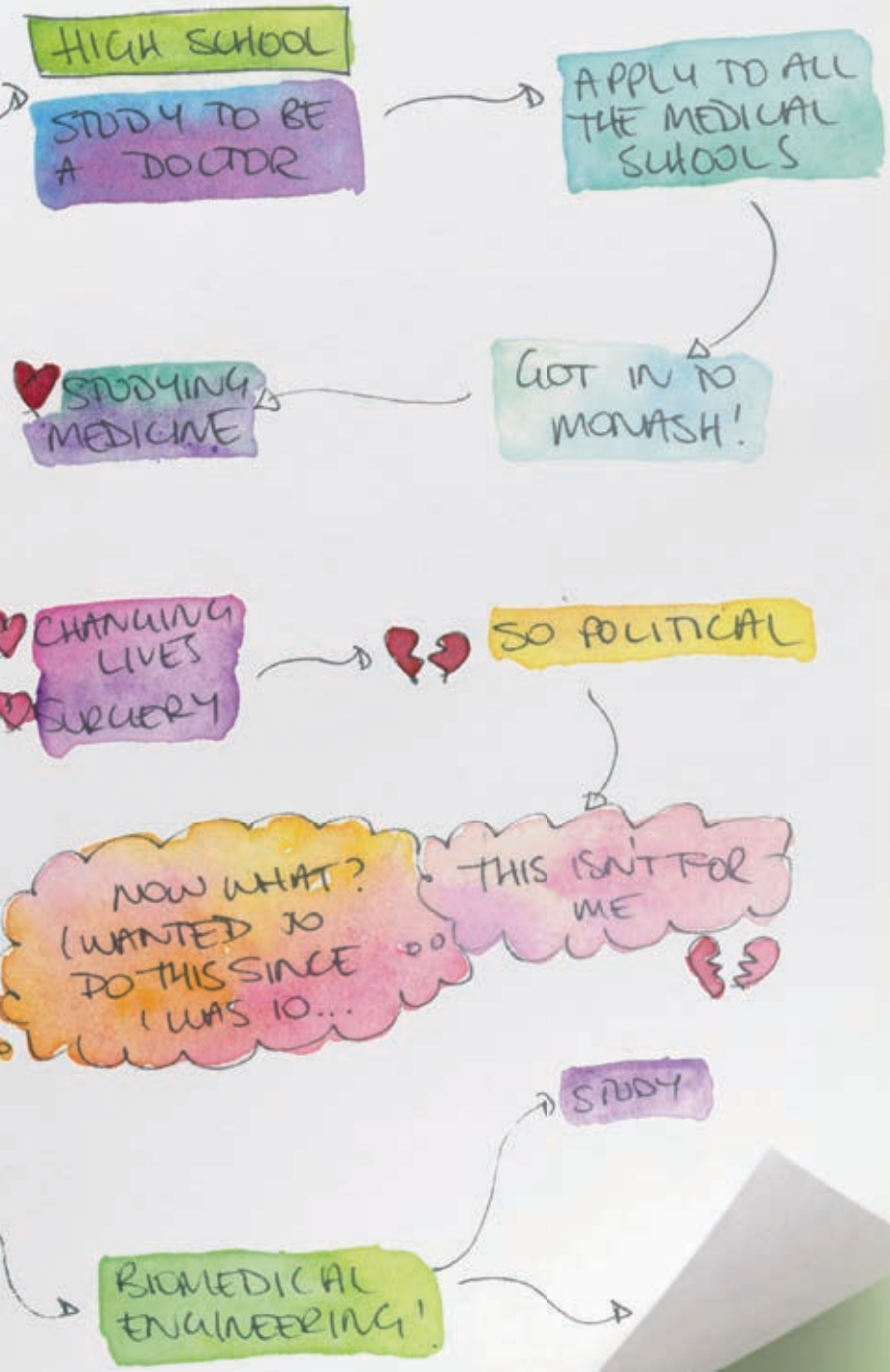


MAPPING YOUR CAREER



IMAGES: AMELIA TRAVERS/ISTOCK

Podcaster **Amelia Travers** explains how and why she charts the careers of STEM professionals and showcases some of the maps she's created.

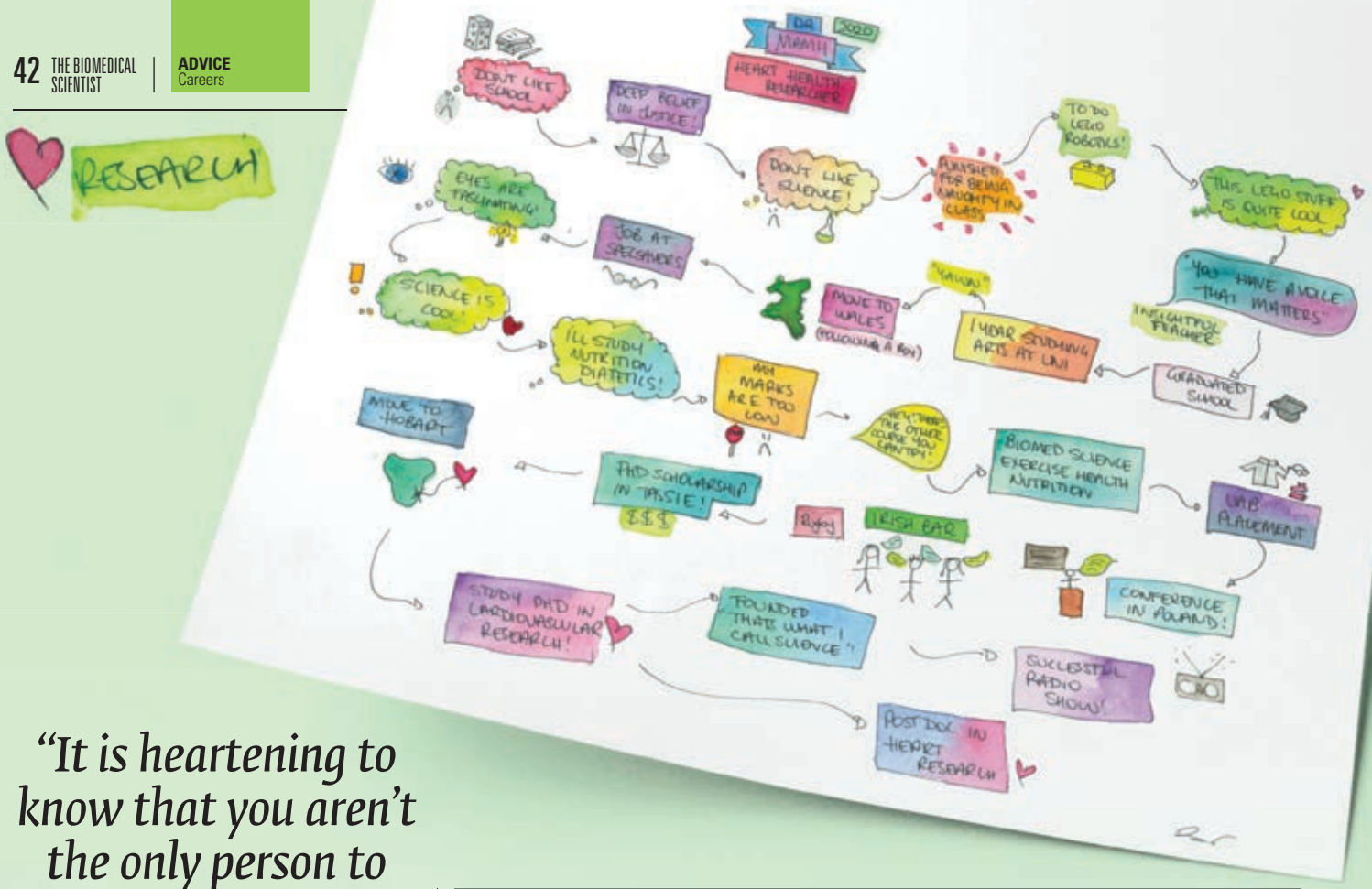
What's the best way to communicate something as abstract as a career? How do you tell a story that encompasses work, education and development through a lifetime?

During the 2020 Melbourne lockdown I started a podcast celebrating the careers of STEM professionals – Avid Research. It's been inspiring, challenging and a wonderful networking tool that brings together my passion for science communication and careers.

Never linear

During each interview I asked people "How did you get to where you are now? How did you go from high school to this job?" The stories I got were diverse and almost never linear. They were also rich in changes and challenges, and I wanted a way to encapsulate them visually, as they deserved a greater audience than just the podcast listeners.

As a trained geographer, I love maps and have experimented with different ways to visually communicate journeys. With careers being such clear journeys and having twists and turns, I decided to try my hand at creating maps that tell one windy story on a single page. The first samples were simple, but colourful and met a very warm reception. The audience loved the visuals and the recipients were



"It is heartening to know that you aren't the only person to have quit a job a couple of weeks in"

thrilled to receive personalised art telling their stories. They engage people in ways that the cold linearity of a CV really can't.

Affirming experience

For the people who have had their careers mapped, it seems to be an affirming experience, and gives people permission to feel pride in their path.

I suspect it is especially beneficial for those experiencing imposter syndrome to see all their achievements in one place – being able to see how you got to where you are and why; it's not sudden success that has come from nowhere!

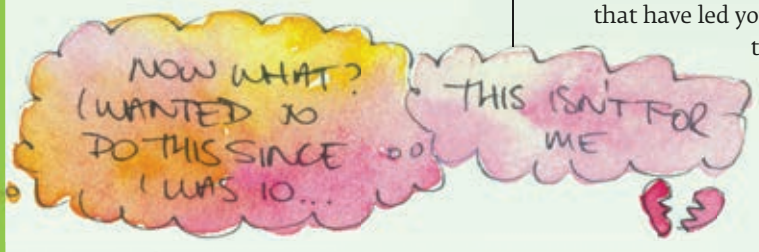
They've also had very positive reviews from people seeing them in person at the Melbourne City Library, where my career maps are currently being exhibited.

It is heartening to know that you aren't the only person to have experienced a career change, or to have quit a job a couple of weeks in because things didn't feel right.

Open and honest

If you have the space and time I highly recommend trying to create your own career map – visually documenting where you were, what you wanted to do back in the day, and then the twists and turns that have led you to where you are today. Combining personal and professional information will likely be beneficial in seeing the whole story; often we make decisions for family or other commitments, which may not seem logical or strategic from a pure career perspective. Careers are one part of our lives; they are often very public, but they are influenced by a myriad of personal decisions and situations.

My hope is that we can move towards a world where we share our careers more visually and in an inspiring way; where we can be open and honest about hardships like failure and redundancies and embrace them as part of the journey. And where we can own our own stories and our paths to where we are now. BMS



AVID RESEARCH FACT FILE

Who is behind Avid Research?

Amelia Travers is a web developer and STEM Educator. She studied Geography, geographic information systems, polar science and teaching.

What is Avid Research?

Avid Research is a passion project, with no sponsorship or payment. It's a window into different STEM careers and an opportunity for people to learn more about the behind-the-scenes of the world in which we live.

Why does Avid Research exist?

The aim is to help people see what they can do with a STEM career, what the challenges are, what the opportunities are and how experimental you can be while working out what you want to do with your life.

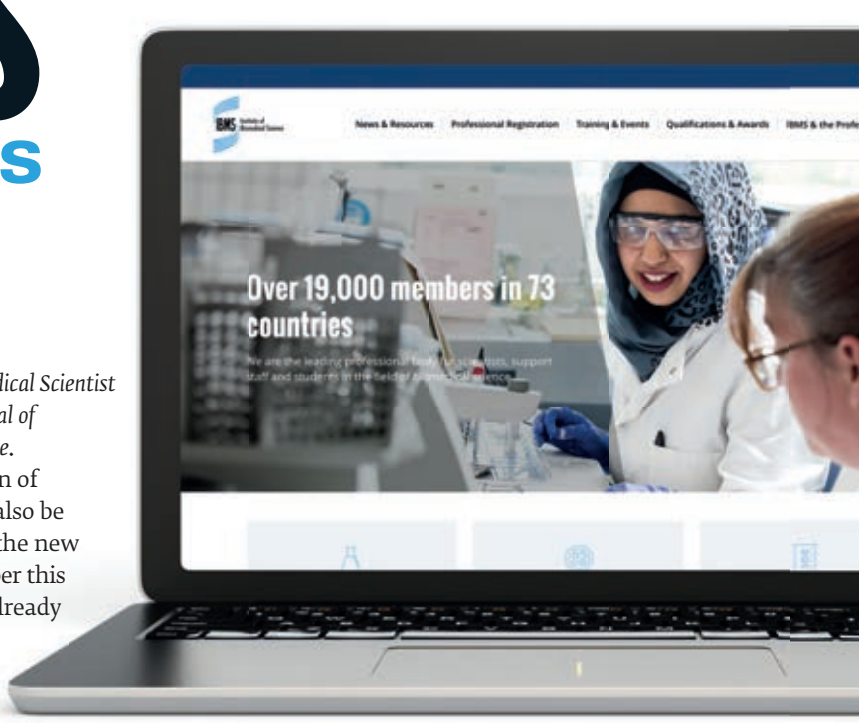
How can I listen to the podcast?

The episodes are released every Friday. To listen, and for more information and resources, visit **avidresearch.com.au**

MY IBMS NEWS

MEMBERSHIP

NEW WEBSITE ANNOUNCED



The IBMS is gearing up to launch a new website, which will deliver a wide range of resources, training and events.

Working with website partner Pixl8 and using a user-centred design with intuitive navigation, the website will include streamlined renewals and give members more access to update their data records.

IBMS members will be able to log their training and maintain records online using a new CPD system, whilst also connecting to an eLearning system - opening up learning opportunities for more of our members.

Other innovative features for members will include:

- Managing your data and membership account with more ease to update personal information and preferences
- Tailored content based on your discipline or career
- Greater access to more content from *The Biomedical Scientist* and *British Journal of Biomedical Science*.

A new version of "My CPD" will also be available with the new site from October this year. If you're already logging CPD using the IBMS system, or you would like to start, there are some actions you need to take.

If you have an IBMS CPD diploma record you will need to:

1. Download and store your CPD record. Your CPD history and evidence files will not be transferred to the new website.

2. Login to My CPD and save your record using the PDF or CSV button.

3. To download your evidence files, select edit on the activity and then click on the file. This will automatically download the file to your device.

When the new CPD system is in place, you will be able to start logging your CPD from where you left off; once you complete 24 activities (including your prior activities) you can apply for your CPD diploma certificate.

→ **For further details on the new website and "My CPD" changes, keep an eye on the IBMS website and social media streams.**

BRITISH JOURNAL OF BIOMEDICAL SCIENCE

Open access and improved impact factor for journal

After one of its most impactful years yet, the *British Journal of Biomedical Science (BJBS)*, will be moving to gold open access.

The move, which is happening with Frontiers publishing, will take place from January 2022.

The news comes after its impact factor grew from 2.712 in 2019 to 3.891 in 2020.

This means the *BJBS* is now ranking sixth out of 29 journals in the Medical Laboratory Technology JCR category.

The growing value of the journal is reflective of the incredible work that has gone into it by both members and editorial staff.

BJBS's move to gold open access will coincide with its 20th anniversary of publication.

IBMS Chief Executive Officer David Wells said: "We believe this will be a big and exciting step for the journal as research publishing is increasingly becoming open access.

"Therefore, it is right that the IBMS should support this as our members will benefit from having greater access to read about the latest biomedical research and being able to publish theirs more easily."

From 2022, all new articles in *BJBS* will be immediately and permanently available to access freely - strengthening the journal's position as a leader for innovative advances in biomedical science.

IMAGES: SHUTTERSTOCK/ISTOCK

PUBLISHING

DIARIES 2022

Please note: Due to publishing difficulties, this year membership diaries will be included in the November edition of *The Biomedical Scientist*, not October.

QUALIFICATIONS

UPGRADE MEMBERSHIP

Recently gained new qualifications? You may be eligible to upgrade your IBMS membership. Email your IBMS number and/or DOB to **subs@ibms.org** with a copy of your certificate (unless issued by IBMS)

→ **ibms.org/my-ibms/upgrade**

CONGRESS POSTERS

DEADLINE EXTENDED

The Congress poster deadline for specific disciplines has been extended until 15 October 2021.

The disciplines are:cytopathology , medical microbiology, virology, immunology, quality management and point-of-care testing.

→ **bit.ly/2W0SIDe**

JEN JOHNSON BURSARY

CONGRESS BURSARIES AWARDED

The IBMS has awarded 20 bursaries to give more members the opportunity to attend IBMS Congress 2022.

The Jen Johnson Bursary was created in 2017 to honour former IBMS Council member Jen Johnson, who was passionate about IBMS Congress and who sadly passed away in March 2016.

It provides successful applicants with a grant of up to £1,000 to attend IBMS Congress. For IBMS Congress 2022, due to the high-level of applications received, the number of bursaries has remained at the increased level of 20 people.

As part of the application, members must submit a short statement that describes why winning the Jen Johnson Bursary and attending Congress is important to them.

→ **To see the list of winners, visit bit.ly/3mb4GoG**

INSURANCE

Malpractice and Professional Indemnity Cover update

The six-month extension to our current group medical malpractice and professional indemnity insurance as provided by Hiscox, will end on 30 September 2021. We regret to inform members that from 1 October, your insurance will no longer be covered through your membership.

Despite extensive discussions and the exploration of options with other providers, we have been unable to find a suitable replacement as insurers are unwilling or not able to provide group cover due to the prevailing insurance market. However, we have been able to agree access to a greatly reduced individual rate for members through our Additions membership discount scheme.

→ **For more information and to access the link, please visit ibms.org/indemnity**

NORTHERN STAR

Sonic Healthcare UK's newest facility taking Manchester by storm!

TDL Manchester has moved to a new 1,920sqm site in Salford, Manchester bringing together five laboratory disciplines in one brand new facility. Work started on the new site in September 2020, with the building being handed over to TDL the week before Christmas 2020. What a present!

The state-of-the-art laboratory is a spacious open plan design for Biochemistry, Serology, Haematology and Molecular Diagnostics, with a separate section for Blood Transfusion. The start of 2021 was extraordinarily busy for Operational Lead, Diane Benson and her team as they installed and verified multiple new platforms, including the latest instrumentation from Roche Diagnostics, Sysmex, Tosoh, Hologic, Abbott Diagnostics and Grifols.

It was essential to maintain continuous service provision throughout the transition period. Staff were active at both the old site and the new laboratory for around three months to progress work and ensure the successful delivery of safe, high-quality services that Sonic Healthcare UK provides.

Staff employed at TDL Manchester were all engaged in the development of the new laboratory and equipment installation, benefiting from the opportunities this created to showcase

Operational Lead, Diane Benson

their skills and knowledge. This allowed for the successful transition from the old site to the new, impressive facility, which is the northern hub for TDL. The new laboratory gained full UKAS accreditation in March 2021, and successfully went live by the end of that month.

The entire laboratory space has been designed to maximise high-throughput workflows, whilst providing for a pleasant and spacious environment for the team of over 100 staff. The Manchester hub lab handles a wide variety of samples from acute private hospitals, clinics and GP practices across the northern region to postal work received from across the UK. The Blood Transfusion department supplies products to six local hospitals via remote electronic issue, which ensures a safe and efficient transfusion service for each of these sites.

Sonic Healthcare UK's reputation of promoting and training its staff has enabled several internal promotions to senior roles over the last 12 months. Diane Benson is very keen to progress staff in their roles and careers, with several currently completing IBMS registration and specialist Blood Sciences portfolios.

The open plan laboratory leads to a true multidisciplinary environment, with the majority of Biomedical Scientists and support staff being trained across all areas within the service.

This first-class facility will continue to serve patients across the north and support the wider work of the organisation, also offering rewarding and challenging career prospects within Sonic Healthcare UK.

For further information on any of the roles available at Sonic Healthcare UK's laboratories, visit: **www.tdlpathology.com/careers**

Staff preparing molecular samples

HERE TO HELP

INDEMNITY INSURANCE

Lynda Rigby, IBMS Executive Head of Marketing and Membership, with an insurance update.

Since 1991, the IBMS has offered insurance to all members as a part of their membership – always looking to improve our level of coverage where possible. Flash forward to 2020. When the pandemic hit, the insurance market shifted along with countless other industries. This forced group policies to be subject to more stringent Financial Conduct Authority (FCA) rules and the current insurance market found this to be particularly challenging to navigate.

As we looked to renew the policy this year, we were given minimal notice from our provider Hiscox that our policy would not be renewed when it expired at the end of March 2021. Their stance was dictated by the changes in their underwriting appetite and FCA attitude on group policies. However, at a significantly increased cost, we were able to get them to extend our policy whilst alternative arrangements were explored.

After months of extensions, meetings with insurance brokers and negotiations we found that other insurers were also unwilling to offer us a group policy. This has led to us having to make the difficult decision that it would no longer be possible for us to provide indemnity cover for members in the way that we have.

After all the challenges of the past year and a half, the last thing we wanted was to have to end this service for our members. Going forward, we want to be able to offer as much guidance and assistance navigating indemnity coverage requirements to those who are affected.

We've reached out to the HCPC to help us dispel any confusion around professional indemnity insurance as a requirement of registration. They state that:

- If you are employed, either by the NHS or privately, then you will have some type of indemnity coverage through your employer. You are advised to ask them about this.
- If you are self-employed, then you will now likely need to find coverage directly through an insurer.
- If you are HCPC registered but no longer practicing, then you do not need to have indemnity cover.

For those who undertake self-employment, the IBMS will provide members with access to a discounted scheme for them to purchase as individuals through IBMS Additions (managed by Parliament Hill). Our insurance brokers advised that the premiums will be much cheaper in this offer than could be obtained independently.

As part of HCPC's indemnity requirement, they stipulate that a registrant will "need to provide cover appropriate to your practice". The HCPC defines "appropriate cover" as depending upon a combination of factors, including, the practice area or areas you work, the service users you work with, and the risks involved with your practice. As an individual practitioner, the HCPC relies on your own definition of what level is appropriate for you in your work, and most importantly "this level of cover will need to be sufficient to meet any liability that may be incurred if a successful claim is made against you".

I want members to know that we are here to help if you have any queries. Although we will not be able to provide coverage as we have in the past, we will have competitive indemnity options in place for members through the IBMS Additions scheme. Our utmost priority remains to support our membership through this transition.

IMAGES: ISTOCK

MY LAB

THE IMMUNOLOGY LABORATORY

Medical Laboratory Assistant **Muneebah Jasat** gives a guided tour of her lab at the Manchester Royal Infirmary.

I am based in the immunology laboratory at Manchester Royal Infirmary, the largest immunology department in the North West. Our laboratory provides a regional service to clinicians and GPs in and around the Greater Manchester area and incorporates autoimmunity, immunochemistry, cellular and manual assay services and contributes to the haematological cancer diagnostic partnership that serves Manchester.

My role as a Medical Laboratory Assistant (MLA) in the immunology department is to ensure that samples are properly booked into our laboratory information system. We also receive work referred from other hospitals via NPEx's Lab2Lab system. As an MLA I provide support to the biomedical scientists who work in the department. The department allows MLAs the opportunity to run the analysers under the supervision of the biomedical scientist in charge of the section. This is useful in helping develop those who want to become biomedical scientists in the future.

A lot of the work we receive is routine, however, there are some tests that may need to be processed urgently. For example, anti-neutrophil cytoplasmic antibodies, which are used in the diagnosis of autoimmune vasculitis, and anti-glomerular basement membrane antibodies, which are used in the diagnosis of Goodpasture's syndrome. Both such disorders may present with acute renal and/or respiratory failure that requires treating swiftly to prevent further damage to the patient's vital organs.

Our department is fully equipped with automated analysers, such as our Bioplex 2200 system, which allows the rapid and simultaneous detection of autoantibodies by multiplex bead array analysis. Another automated analyser is the Optilite, which uses turbidimetry to measure antibodies and complement. For example, it measures serum free light chains, which are used in the diagnosis and monitoring of multiple myeloma.

For me, the major aspect that sets our department apart from other regional laboratories is our close contribution to the Haematological Cancer Diagnostic Partnership by providing flow cytometry support. This work is done by the cellular section, which is equipped with two Beckman Coulter Navios flow cytometers. These are used to determine if a patient has a chronic or acute leukaemia and whether the leukaemic cells are of lymphoid or myeloid origin. The characteristics of neutrophils are also assessed on the same analyser using the dihydrorhodamine assay. This is useful in identifying patients who suffer from chronic granulomatous disease, whose neutrophils are unable to kill bacteria.

The cellular section is also responsible for diagnosing patients who may have a primary immunodeficiency, which may affect lymphocytes or neutrophils. This is done by assessing the subsets of T and B lymphocytes using an automated flow cytometer called the Aquios.

Our department is known for providing an excellent service to its users. We achieve this by working as a team and overcoming challenges together. It is satisfying to know that behind every sample I prepare is a patient that I am helping in either their treatment or diagnosis.

I'm very proud to work for the immunology department with the knowledge that our efforts serve to improve the health and quality of life of thousands of patients with immunological disorders. BMS

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Meridian ImmunoCard (rapid EIA format)

- ImmunoCard C. difficile GDH and ImmunoCard Toxins A&B are rapid EIA's which are easy to use with results in 15 minutes

Meridian Alethia (LAMP molecular assay)

- Alethia C. difficile is a molecular assay to detect the *C. difficile* toxin gene (PaLoc) using LAMP technology in less than one hour

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- Automated ELISA and LAMP systems together with full technical support available from Launch Diagnostics

C. DIFFICILE PORTFOLIO	
premier	C. difficile GDH Toxins A&B
immunocard	C. difficile GDH Toxins A&B
alethia	C. difficile LAMP

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