

converse

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Volume 48 Issue 1 Spring 2022



President's Prize 2022

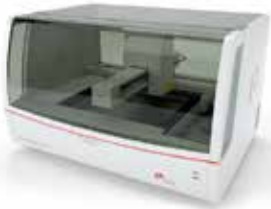


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The Academy had been hoping the BioMedica2022, postponed from 2020 could take place as normal in March. During the Christmas period we monitored the impact of Covid-19 and latterly the Omicron variant on society and particularly on the impact to the health sector, staff, and management. As numbers continued to increase in January it seemed unlikely BioMedica could deliver an audience in sufficient numbers to make the event a success for exhibitors and visitors alike. The Academy also had to consider requirements of exhibitors to arrange logistics, travel etc as early as possible and that they needed us to call this before they began to make arrangements. In early January, the Academy took the reluctant decision to postpone BioMedica until 27th – 28th March 2023. We will however hold BioMedica2022 online on March 28th and 29th. Full programme www.acslm.ie.

The National Working Group to inform the Strategic Direction of Laboratory Medicine and Services has been established. The terms of reference and membership of the group have been published. The first meeting was held on February 24th. Our nominee Marie Culliton is already hard at work and is supported by Academy Council. Council are also consulting with laboratory managers and members. We hope this group will set direction and provide a blueprint for this review and that the knowledge, skills and competencies of Medical Scientists will be recognised and permitting them to work to the top of their licence, and reach their potential and parity of esteem with their other professional colleagues in the laboratory.

I am delighted to feature so many pieces from our Medical Scientists across the spectrum of their careers. Dr Catherine Ludden is a Medical Scientist graduate from GMIT, has written about her amazing career and her contribution to COVID-19 epidemiology. She is a genomic epidemiologist on secondment at the COVID-19 Genomics UK Consortium (COG-



Helen Barry

UK) where she is Director of Operations. Catherine previously held the position of Head of Operations for the Pathogen Genomics COVID Programme at Public Health England (PHE) and was responsible for the service delivery of SARS-CoV-2 genomics in the UK and the continuous genomic service improvement. Prior to joining COG-UK and PHE, Catherine was working with the European Centre for Disease Prevention and Control where she provided scientific and technical expertise for the analysis and interpretation of European whole genome sequencing datasets and supported international outbreak investigations. Natalia Unrath is well on her way to a great career in Medical Science, with her PhD studies and also working in Connolly Hospital. I was pleased to see Natalia acknowledge some former colleagues of mine, her lecturers Drs Denise Drudy and Celine Herra who inspired her love of microbiology and her Chief in Connolly Hospital, Carol Tiernan. Carol had the vision and leadership to accommodate her in the lab so that Natalia can work and carry out her research. This is a model that could be explored by other Chiefs to ensure clinical labs can hold on to more of our graduates and in time benefit from their expertise. Thanks to Dr Anne MacLellan,

who encouraged Natalia to write the piece for Converse. Other student and Medical Scientist mentors Dr Debbie Corcoran, Helen Cregg and Dr Joan O'Keefe are also pushing out boundaries winning awards and posting blogs. This is so important in showcasing the work of Medical Scientists.

Congratulations to our President's Prize winner, Julie Twomey and to Danielle Scally our case study winner. Great to see the work during the pandemic of my former colleagues in Virology at St James's acknowledged with their award from the CEO.

Early career scientists and students feature with our President's Prize competitors abstracts in our research section and under grad and published research. Keep an eye on our website for dates for President's Prize and a Webinar seminar for early career scientists organised by our Engagement and Advancement Advisory Body.

Congratulations to those members on the move. Mick Amoroso, Chair of our Clinical Chemistry Advisory Body is moving to the Mater. Dr James O'Connor, Chair of our Engagement and Advancement Advisory Body, is taking up a position as lecturer in MTU. Susan Treacy has just taken over as CEO of HealthTech Ireland. I did an interview with her recently. The Academy has worked with Susan and HealthTech Ireland in the past and we look forward to continuing our partnership.

The first Mentoring programme is now up and running. Expressions of interest are now requested for our next programme.

It was with great sadness I learnt of the sudden death of my former colleague at St James, Paul O'Rourke. Paul was so cheerful and always so helpful to me and all of his colleagues. I know the haematology and all labs in St James's were devastated at his loss. To compound the family's tragedy, Paul's mother, who had been unwell, passed in the days following Paul's funeral. Ar dheis Dé go raibh siad.

I take this opportunity to remind Medical Scientists to renew their membership for 2022. We need your support. Strength in numbers!

Helen Barry



The Academy of Clinical Science and Laboratory Medicine,
31 Old Kilmainham, Dublin 8.

Tel: 01-905 9730
Fax: 01-902 2764
Email: mail@acslm.ie
Web: www.acslm.ie

Editor: Helen Barry
Deputy Editor: Anne Mac Lellan

Advertising: Roger Cole
Silchester Marketing Ltd.
Tel: 01-285 9111 • **Mobile:** 087-2611597
Email: roger@silchestermarketing.com

Production/Design:
Artworks Graphic Design
Dalkey Business Centre,
17 Castle Street, Dalkey, Co. Dublin
Tel: 01-2751707 • **Mobile:** 086-2611598
Email: design@artworks.ie
Web: www.artworksireland.com

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Message from the President



Like all of you, I too have begun to forget which year the pandemic started. Could it have been 2020 and where did the last two years go?

For all of us – time waxed and waned in a haze of increased workloads, new learning, new equipment, new analyses, new test protocols, new committees, new guidelines, new SOPs, new ways of working. We up-skilled, learning to communicate effectively from both 2 metres and remotely.

IT connectivity has also remained a National issue, obtaining new connections, staying connected, restoring connectivity and a realisation that IT connectivity is central to the delivery of our Clinical Laboratory Diagnostics and outdated systems can no longer be sustained.

The failure to match National Guidelines for Chronic Disease Management with a review and investment in the requirements for Clinical Laboratories including automation upgrades, order comms, delivery schedules and immediate and future staffing requirements.

Despite all of our collective efforts, professionalism, and expertise as Medical Scientists to support these National Emergencies, the issues of staffing, adequate staff, staff retention, career progression and staff burnout, remain. Despite regulation of our profession by CORU, unlike other HSCP professions, this has served to fracture rather than consolidate laboratory personnel, as unregulated and non - registered laboratory staff and the ongoing creation of informal grades continue as patient safety issues.

The Academy as your professional body has engaged with multiple stakeholders and highlighted repeatedly at the highest level that career progression is both crucial and central to staff retention. The patient, indeed all patients, deserve the support of expert Medical Scientist diagnostic practitioners, providing quality diagnostic services, evaluating and guiding their diagnoses, in the day, in the evening, at night, the weekend and in critical emergencies 24/7/365 across all laboratory disciplines.

The Academy welcomes the establishment of the National Working Group to Inform the Strategic Direction of Laboratory Medicine. The Academy nominated representative is Marie Culliton and Marie will be ably supported by sub- group consisting of Dr Irene Regan, Paudy O' Gorman, Sinéad Creagh, Bernie Quirke, Helen Barry, Pat Mulhare and myself. Marie has multiple years experience as a Medical Scientist and Laboratory Manager, has been actively involved in our profession serving as President of the Academy and internationally as president of EPBS and is currently President Elect of IFBLS.

Now more than ever we need your support and engagement to ensure your voice is heard, your expertise is recognised and valued, so as to achieve the long term goals of adequate and expert staffing for Clinical Diagnostic Laboratory Services, with career progression for all.

Bern-Lette Jackson

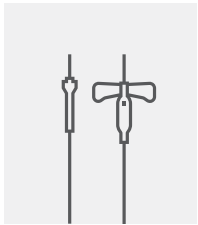


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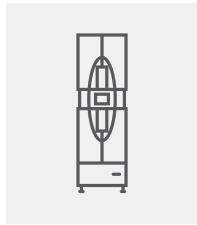
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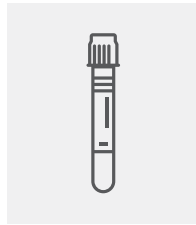
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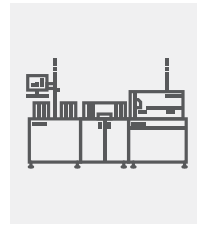
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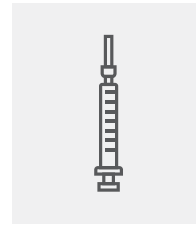
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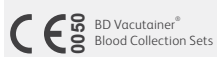


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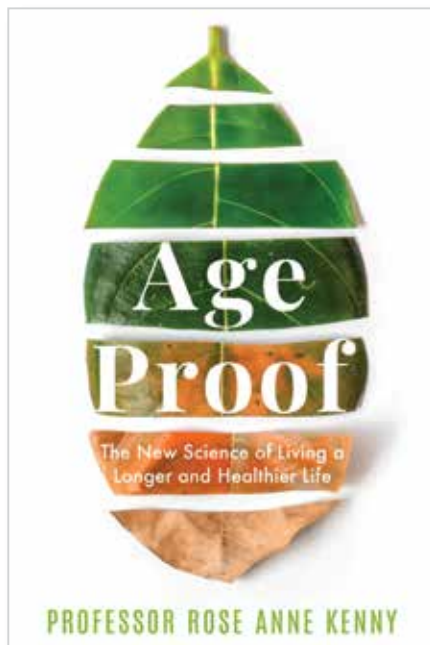
Age Proof: the new science of living a longer and healthier life

by Professor Rose Anne Kenny,
published by Lagom, an imprint
of Bonnier books, 328 pp.
By Anne Mac Lellan

Do you want to live longer and be happier and healthier? Then treat yourself to Rose Anne Kenny's new book, *Age Proof*, which contains a lively mixture of the 'why', the science behind aging, and the 'how to', strategies to age longer and better.

A positive attitude is key to successful aging. The truth of the old saw that 'we are as young as we feel' has been confirmed by a number of studies including the ground-breaking work of Prof Rose Anne Kenny and her team at TILDA (The Irish Longitudinal study on Ageing). She states that perceptions can override other factors that otherwise limit physical aging. Simply feeling younger than your chronological age slows the pace of aging, irrespective of diseases or disorders. So, it's official, I am really 35 – with apologies to my daughter (chronological age 35) who may just have grounds to contradict this.

There are various key studies with respect to aging that we have probably all heard about but forgotten the exact details. Early in the book, she discusses the eponymous 'Nun study' asking can you imagine being asked to take part in a study where the researcher asks if you would not only be willing to be examined in detail at regular intervals throughout your life, but, at death, asks that you donate your brain for dissection? In 1991, some 678 American nuns agreed to do just this. For researchers, the similarity of their physical backgrounds was key; they had similar marital status, lack of children, income and socio-economic status, similar diet, lived together, didn't smoke or drink and had access to the same preventive, nursing and medical services. The nuns all wrote a letter when they were 20 and taking their final vows. These letters provided insights into their attitudes. The nuns who expressed more positive emotions, lived on average a decade longer than their less-positive peers, and they were less likely to get dementia. Rose Anne Kenny is adamant that the same applies to us: 'the more optimistic and positive our perceptions, the more likely we are to live longer, healthier and happier lives.' So, smile!



Or while you're at it, expand that smile to a full-blown belly laugh. There is an entire chapter dedicated to laughter and purpose. Laughter is a social behaviour. According to Kenny, we use it to bond and to communicate. As well as making us feel good, laughter contributes to better health by exercising muscles, increasing respiration and blood circulation and improving digestion. Laughter also increases endorphins, our 'feel-good chemicals'. It raises serotonin and dopamine levels - endorphins which play a critical role in pleasure, motivation, memory and reward. So, with high endorphin levels, we feel calm, poised, confident and relaxed. And the good news doesn't end there, endorphins play a role in the immune response which declines with age. Replenish your endorphins by enjoying and, if possible, sharing the laughter when you watch your favourite comedies or read amusing books or articles.

So far, so good, so painless. But, what about hormesis? Briefly, hormesis is where low doses are protective and high doses are detrimental. A cold shower or cold-water immersion has a hormetic effect as it forces the body to recover normal core temperature after the cooling stimulus. Rose Anne Kenny states that the number of cold receptors in the skin is up to ten times that of warm receptors. So, on exposure to cold water, blood vessels contract and raise blood pressure, which coupled with the

temperature shock, sends electrical impulses from peripheral nerve endings to the brain, triggering an increase in important chemicals such as noradrenaline. In the interests of research for this book, I decided to end my warm morning shower with a cold drench. I fully concur with Kenny's description of body shock. You may well laugh! Anyway, for the hardy souls among us (and this is not easy for those of us who got wetsuits for Christmas!), cold water swimming doesn't just impart clarity to the skin and a healthy glow, there is also evidence to support associations with decreases in tension and fatigue and improvement in mood and memory. So, when one of my colleagues on our infection control team reminds me that her family all swim in cold water without wetsuits and that our family are 'wetsuit wimps', I will keep quiet in future...it seems she might just be right.

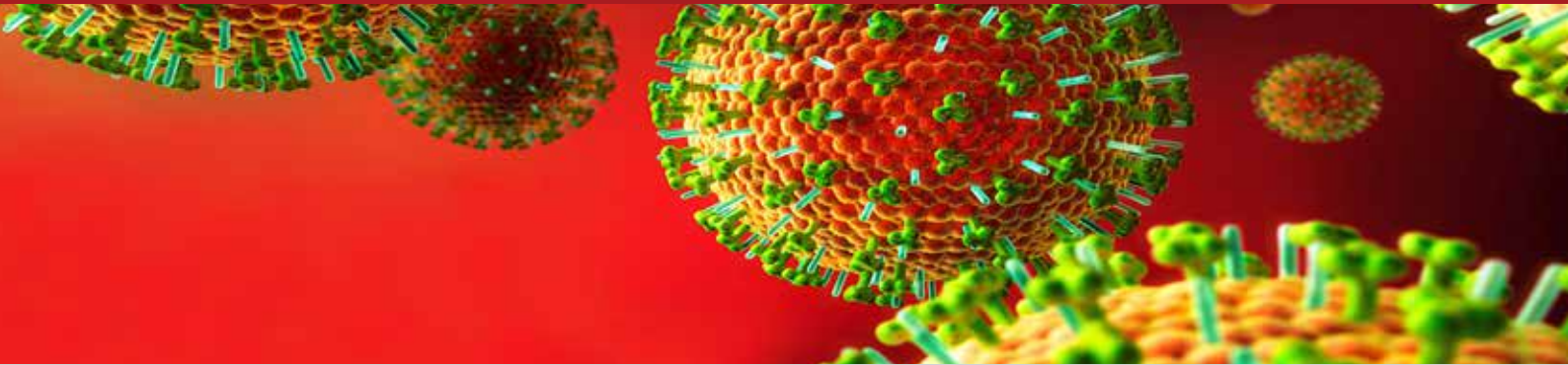
Of course, it's not enough to think you are younger than your chronological age, to smile and laugh, and to douse yourself in cold water. Diet comes in for attention too. Here, the advice is contrary to the usual received wisdom. Skipping breakfast can be good for you! The science is that our metabolism slows as we age so we are more likely to put on weight and develop 'metabolic syndrome' which includes increased blood pressure, high blood sugar, a large waistline and abnormal cholesterol or triglyceride levels. This syndrome puts us at increased risk of chronic health issues, including heart disease, stroke and diabetes. Kenny looks to the diets of people living in the world's blue zones, where people live longer and are healthier. Their diets are high in fish, 95 per cent plants, very low in red meat, moderately low in dairy and eggs and very low in sugars, and completely devoid of processed foods. Usually, just four drinks are consumed: water, coffee, tea and wine. Kenny suggests that calorie restriction 'holds huge promise for deceleration of aging'. She advocates various fasting regimes. Her preferred choice, in her own life, is the 18-hour fast, so she skips breakfast, eats two meals between midday and the evening (within six hours) and fasts overnight and next morning. While this works for her, she acknowledges that fasting is not for everyone, so she suggests curtailing eating to an 8-10 hour window and, if possible, avoid snacking.

Sex and intimacy are rarely discussed in the context of older people however Kenny notes that thankfully the world has moved

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on and the importance of sex for all ages is recognised and valued for women and for men. Kenny writes, that as a medical student taking a patient's history, she diligently asked about sexuality and sexual problems. 'I recall how older patients visibly changed, from being meek and passive to engaged and animated, when speaking about their sexuality.' There are physical and mental benefits to sexual activity and it seems that being sexually active is an independent benefit for brain health.

When it comes to exercise, Kenny retells the familiar story of London bus conductors and drivers. For those too young to remember bus conductors, they walked up and down the bus selling and checking

tickets while the driver remained sedentary behind the wheel. Two London pathologists, in the 1950s, observed that they seemed to be carrying out more post-mortems on bus drivers than conductors and more desk-based post office workers than postmen.

To explore their idea, the pathologists contacted all of the pathologists in the UK and requested details of post-mortems on all male deaths together with their occupational histories. Their suspicions were confirmed with sedentary occupations associated with early death. As well as conferring physical benefits, exercise also improves mental health and well-being, increasing the size of the hippocampus, which is the seat of learning and memory.

This contradicts the old theory that we can't grow new nerve cells – it was assumed that we were born with a certain number of brain cells and as we get older, we lose cells until some of us develop dementia. This is not necessarily the case.

Kenny's book distils her experience of more than 35 years in clinical and research practice and, in particular, the findings of TILDA. She has included a number of tests at the end of the book so that we, the readers can self-test ourselves and see how we compare to our chronological peers. These tests are fun, interesting and informative... in fact, I skipped to them before reading the book as I didn't want to bias my answers! You may wish to do the same!!

Creative activity in the ageing population

Siobhan Scarlett, Ann Hever, Mark Ward, Rose Anne Kenny November 2021

https://tilda.tcd.ie/publications/reports/pdf/Report_CreativeActivity_OlderPopulation.pdf

In addition to its two-yearly questionnaires, in July 2020, TILDA sent a questionnaire to each participant to capture the impact of the first COVID-19 lockdown period on their lives. This research assessed involvement in a range of creative activities from going out to films, concerts or plays to reading books or magazines for pleasure, listening to music, radio, and doing creative hobbies. A 'creative activity score' was produced for each individual, taking into account the number of creative activities they were involved in and the frequency they partook in each activity. Perhaps unsurprisingly, the study found that older adults reporting the highest levels of involvement in creative activities reported the highest quality of life, and scored lowest on loneliness, depression, worry and stress measurements. The level of involvement in creative activities was consistent between ages 50-74 years, before beginning to decline more rapidly from 75 years and older. Higher educational attainment and higher income were strong driving factors for regular involvement in creative activities. Women were over three times more likely than men to read books, magazines or newspapers for pleasure weekly, while adults living in rural areas had lower involvement compared with those in urban areas.



In Their Own Words: The Voices of Older Irish People in the COVID-19 Pandemic

Niall Costello, Mark Ward, Paul O'Mahoney, Rose Anne Kenny, July 2021

https://tilda.tcd.ie/publications/reports/pdf/Report_C19ParticipantVoices.pdf

The pandemic, as well as disrupting family life, also had a dramatic effect on the working lives of older adults. This study found that the loss of working life as part of restrictions was particularly frustrating for many participants, and many expressed stress and worry about ever returning to employment. In addition to the financial strain of unemployment, participants also referred to the loss of emotional investment and sense of identity that they had developed through their normal working lives. Beth, 62, is quoted: "I've been at home since mid-March hoping to return to work soon. While it's been great to spend time with family and my pets, it has also been very stressful. Days when I didn't see or speak to anyone." She worried that she was working full time before COVID. Due to the financial impact on their business she was now on a two day week.

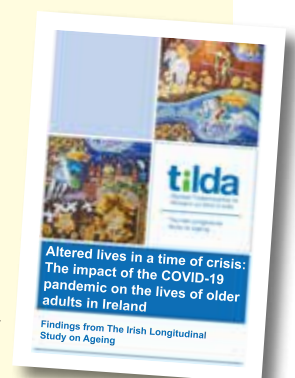


Altered lives in a time of crisis: The impact of the COVID-19 pandemic on the lives of older adults in Ireland

Editors: Mark Ward, Paul O'Mahoney and Rose Anne Kenny

<https://tilda.tcd.ie/publications/reports/pdf/c19-key-findings-report/COVID-19%20Key%20Findings%20Report.pdf>

This is a wide-ranging report, including changes to everyday activities, participation in exercise, compliance with regulations and restrictions, loneliness, stress, use of healthcare services, medications, changes in caring roles... Sadly, restrictions due to the COVID-19 pandemic have had a dramatic effect on non COVID-19 related healthcare services in Ireland. According to this study, this has resulted in an 'array of healthcare needs being unmet'. As older adults have greater healthcare needs, they are likely to be the most affected by this. Nearly one-third of adults aged 60 years and older delayed or did not get medical care that they needed. Many older adults delayed going to the GP or dentist from fear.

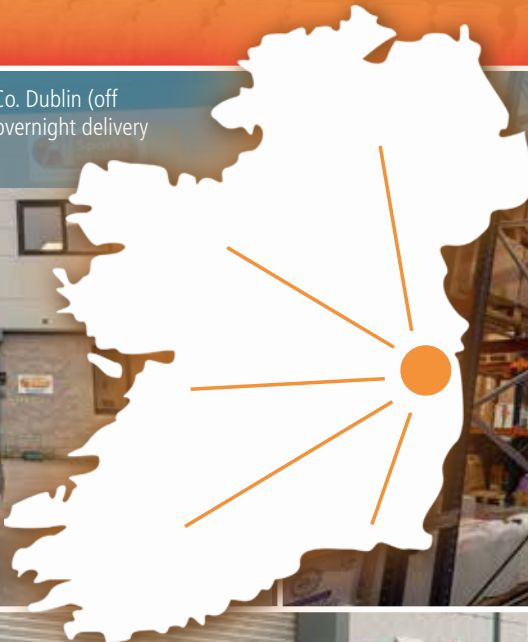




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Are we effectively tackling misinformation?

Cían Ryan, Senior Scientist, UK Health Security Agency



Since joining the workforce, I have worked in numerous settings of medical science in Ireland. I have discovered that the feeling of self-confidence (and colleague encouragement for that matter) in expressing our views and expert opinion is very much a checkerboard effect. I have at times felt empowered to be allowed speak up about areas I have worked or done research in. And other times I have felt silenced. After so many years in formal education, so many years of relevant and applied work experience and so many years of continued professional development I find it hard to believe I allowed myself to feel silenced and put in a box. After all, in college it is not that we are taught to keep advisement for other job titles. What we are taught is to never advise without scientific evidence to back it up.

The pandemic has lent a good opportunity for different arms of healthcare, including Medical Scientists to showcase their expertise and scientific advisory skills. Some have taken advantage of this and have showcased their knowledge on social

media platforms with coherence and professionalism. But unfortunately, I have seen healthcare professionals, including Medical Scientists, who have used social media as a platform to discuss professional matters in a non-professional way over the past two years.

Social media can be a grey area when it comes to separating your personal and professional persona. Many of these social media accounts were created to be for 'personal use' and often include statements such as 'opinions not necessarily those of my employer' or 'my opinion only' in the description. However, when you additionally include your professional title or professional affiliation in your description, although the account may be 'for personal use', you are creating a connection in your reader's mind between your beliefs and those of your profession. Thereby how you conduct yourself on such an account can impact audience's perceptions of your profession's views, beliefs and conduct. I believe this is important as any backfire effect from an audience's bad experience read an argumentative

piece increases their chances of being predisposed to reject any future message from its source or their profession.

Regarding discussion on issues of public health, there is an obvious societal cost of misinformation. And if individuals are misinformed, they are less likely to make decisions that are in their own best interest, or the interest if those around them. The obvious example being societal behaviour during the pandemic such as the decision to comply with mask wearing, social distancing or to accept a COVID-19 vaccination. The below discussion is just some food for thought on how to more impactfully address opposing healthcare arguments both on and off social media. I should mention here that I fully intend for this piece to stay within the realm of opinion pieces.

As Scientists we are good at straight forward persuasion, providing evidence to back up our points. For our typical dissemination to the scientific community and key decision makers this is perfectly effective. We need to present the most up-to-

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date and reliable information in an understandable manner. However, when we are addressing people who have opposing views to ours with regards to matters of healthcare and lower levels of healthcare literacy, we need to consider that they may have a different stake in the discussion than our typical audience.

It is not always useful to just to tell someone that their opinion or view is wrong. Research into mental models have shown that this rarely has an impact. This assumes the psychological theory that individuals produce mental models for their beliefs (kind of like a flow chart of events). The problem with simply trying to debase a belief without offering an alternative explanation means that people are left with a mental model that is incomplete and no longer makes sense to them. Studies (Johnson and Seifert, 1998) have shown that despite subjects being able to demonstrate awareness of a debasement of their belief, they may still rely on debased information when recalling or engaging in debate. People are often uncomfortable with knowledge gaps and therefore can prefer an incorrect mental model over an incomplete one. It is therefore important to provide an alternative explanation such as your own belief and ideally the rational for that belief in the form of scientific evidence. The more internally coherent your argument is to your audience the better it will fit with their mental model and become reinforced.

Although dependent on your method of dissemination, you could employ what is called 'repeated retraction'. This may work for something like twitter where you can retweet a thread over a timespan to reinforce and remind your audience of your alternative explanation, but this is not going to be feasible for a piece of writing that is only going to be published once on a website or in a publication. Repetition can strengthen the correction force of an argument, but it does come with warnings too. When repeating your argument to an audience, you need to remember to focus on your alternative explanation and the facts of why you support this view. If you spend time summarising or creating context by repeating the misinformation to an audience, you run the risk of further familiarising them with the misinformation. This is known as the

'familiarity backfire effect' and ends up reinforcing the misinformation in your audiences minds instead of correcting it. Of course, it is not always possible to argue your view without referencing the misinformation that you are trying to address. Therefore, what can be effective is to provide pre-exposure warnings that the information you are about to address is considered misleading information or misinformation. This way what you are actually doing is reinforcing a warning tag to the information so that whenever it is referenced by your audience, they may associate it with terms such as 'misinformation' or 'misleading'. Studies have found that warnings are more efficient if they are delivered prior to the information in question in contrast to follow-up warnings (Chambers and Zaragoza, 2001).

Try your best to ensure your message is as simple and digestible as possible. Studies into decision making highlight that individuals will often accept an explanation if it is simpler to understand, in favour of the true explanation if it is too complex. This is unfortunately a difficult thing to do as often the answers to questions of Medical science and infectious disease transmission are in fact complex! But where processes are complex, the best we can do is choose a more simplistic and visual approach to explaining our view. Although you may have gathered numerous sources and have numerous examples of evidence which you could use in your argument, there is such a thing called the 'overkill effect' (also known as the 'protest too much' effect) where there is a threshold for the amount of evidence you supply before it starts having the opposite effect on your audience. Try using fewer (but strong) bits of evidence to support your argument.

It is also ok for you to provide a pre-exposure warning for your evidence. For example, if you quote a study on case-fatality rates in COVID-19 patients, you can remind your audience that this paper was carried out in a cohort of hospitalised patients and therefore it is likely that the findings would be more extremely than a study which was carried out in the general population due to the increased presence of co-morbidity in hospitalised patients. Providing a certain level of scepticism in your own sources can bolster a sense of trust, that you have thought

through the evidence you are providing and that you are not blindly quoting studies that you think fit with your view.

There will then be those who hold very strongly to their worldview and any arguments or evidence that threaten their worldview will end up affirming their belief even further, something known as the 'worldview backfire effect'. It is likely any form of argument that you could present to them will not be entertained. This is where you really need to change your approach and lower your expectations for a result. When you consider this is the type of audience you are looking to target, your best approach is a more humanised approach where you do not aim to argue your point, but instead invite them into your worldview, show them what you believe and more importantly why you believe it. Curiosity is a basic trait of our human nature, and as people we are always curious to see the world how other people see it. In order to do this, we must let our guard down. Words gain strength when they are instilled with a human experience. When we are open and honest with our audience, we allow them a chance to let their guard down and entertain our ideas without feeling threatened. To do this you must recognise your audience's worldview and empathise with their experiences. Building this symbiotic curiosity with your audience means they are more likely to be receptive to what you have to say. Why this is effective is because you are presenting the same information but the way you are framing it is less threatening to someone who has a stake in the topic that is being argued. After all, in an argument, in order for one party to be recognised as the winner, the other party must recognise themselves as the loser (Elbow, 1998). I think this is the most common mistake made when dealing with misinformation in healthcare. The arguments used are often those that would only work on allies, not on the opposition. When you frame your message as an invitation to see the topic through your eyes, there are no winners or losers, you are not asking for your audience to accept your belief, only to recognise your beliefs, if only for a small period of time. What you accomplish by doing this is you plant an alternative idea in their mind. This alternative idea may overtime grow in familiarity and become reinforced whenever they are reminded of the

topic during future events. If you think about how people change their mind on something, it is a gradual process over time and rarely in an instant.

Just a final note on the topic of authority. I believe Medical Scientists should be able to use their scientific knowledge, research, and critical analysis skills to disseminate correct scientific information to a wide audience. We can be recognised as credible sources of information due to our overlapping placement in healthcare and science. However, I think it is important that anyone engaging in science communication lets their authority speak for itself. Using your authority as an argument in and of itself rarely has beneficial effects. Your argument is more likely to be rejected when delivered as an authoritative correction as people generally do not like being told what to do or think. If I can draw a parallel to how we as healthcare workers care for service users in sexual healthcare. We need to be able to provide education and guidance and be slightly coercive while making sure never to be patronising or judgemental. For those who recognise and respect authority, your position in healthcare will strengthen your argument without having to resort to affirming their awareness of your professional background. Other people then tend to be more receptive when spoken to on a peer-to-peer basis and getting down off a pedestal and providing a humanised approach can be extremely effective at reaching this audience too.

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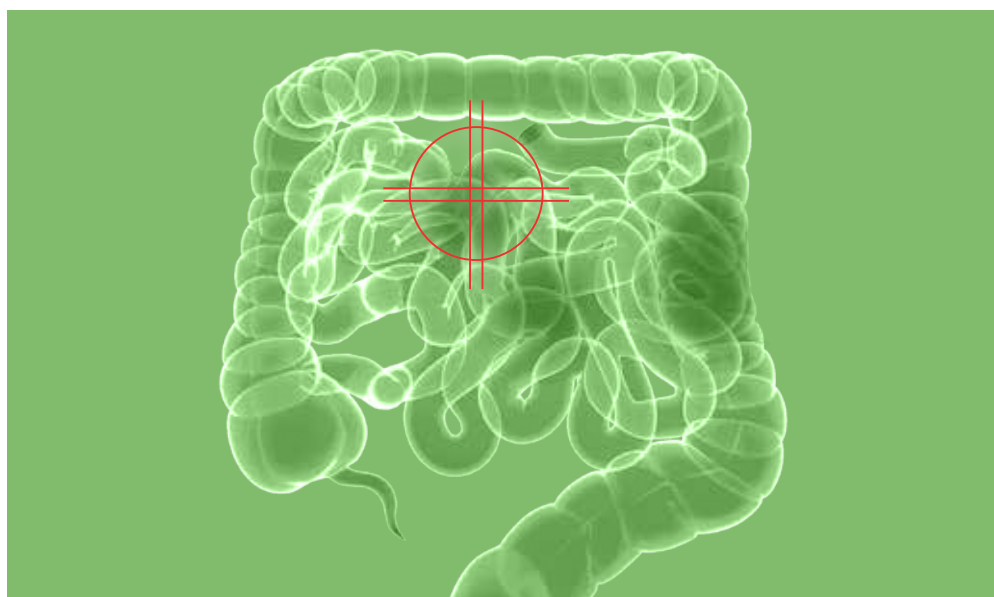
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Cian is on Academy Council and is a member of the Academy's Engagement and Advancement Advisory Body. He started his career as a Medical Scientist (Immunology) in Mullingar General Hospital and subsequently at the Mater before joining the doctoral training programme at Lancaster Medical School. His research involves looking at the impact of COVID-19 vaccination on SARS-CoV-2 transmission networks in the UK.

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COACHING: A Key to Transformation

Denise Hennessey, Quality Manager and Executive Coach

What is Coaching?

Coaching is a quest to maximise personal and/or professional potential through thought provoking conversation. It can be a one to one or a group process. Central to the philosophy of coaching is that the coachee has the potential to find their own solutions from within. The coach does not offer solutions, their role is to facilitate the process and move the coachee forward. A coach is different from a mentor in this respect. A big part of a coach's job is to enable change, at an individual level, a team level and at an organisational level. (1)

Be the change you wish to see in the world. – Mahatma Gandhi

The coaching session

It is crucial to remember that in any coaching relationship, it is the coachee who drives the agenda, not the coach. A coachee must enter the coaching process of their own free will, be open and be honest. The relationship will consist of monthly, one hour long meetings at a mutually agreed time. It is important that meetings are face to face, be that virtually or in person, as body language can offer other signs and signals of how a coachee may be feeling. The coach will listen and facilitate in the session to ensure the coachee gets the most value out of the session. It is up to the coachee to determine goals, to stay committed to these goals and keep any agreements made during the sessions. This helps the coachee learn to be accountable, more resourceful and implement their own solutions sustainably.

Coaching models

Different coaches will use one or more of coaching models, dependent on the coachee's needs. The GROW (Goals, Reality, Options, Wrap up) model is performance orientated. The GROW model is both goal focused and solution focused. (2) The co-active model is a more fluid model. It is based on four cornerstones:

- people are naturally creative and wholesome,
 - focus on the whole person,
 - dance in this moment,
 - evoked transformation.
- Regardless of the model used, level

III listening is practised. In level III the coach is aware of what is being said, how it is said, the environmental stimuli and their effects and what is not being said. It is listening at its best. (3)

Coaching Tools

One of the main strategies used in coaching is reflection. (4) Worklife in the lab is busy and there is little room for reflection. A lot of time is spent on situations and people that we cannot control. Coaching offers a safe space and time for the coachee to reflect on where they are and where they want to go. Imagery can be quite powerful, especially if someone is finding it difficult to convey their future desires. (5) With career coaching, writing a retirement speech is often given as homework, to provide the coachee with a focus on where they want their career to go. Reframing a situation can often be helpful to a coachee. For example, a coachee enters the process feeling fed up in their current job but after some discussion they come to realise that the issue is, they can no longer grow any further in their current job and self-growth/learning is actually one of their top values. With this insight the coachee can now set a goal for this new actionable issue around

self-growth as opposed to staying "stuck" in a job they think they hate.

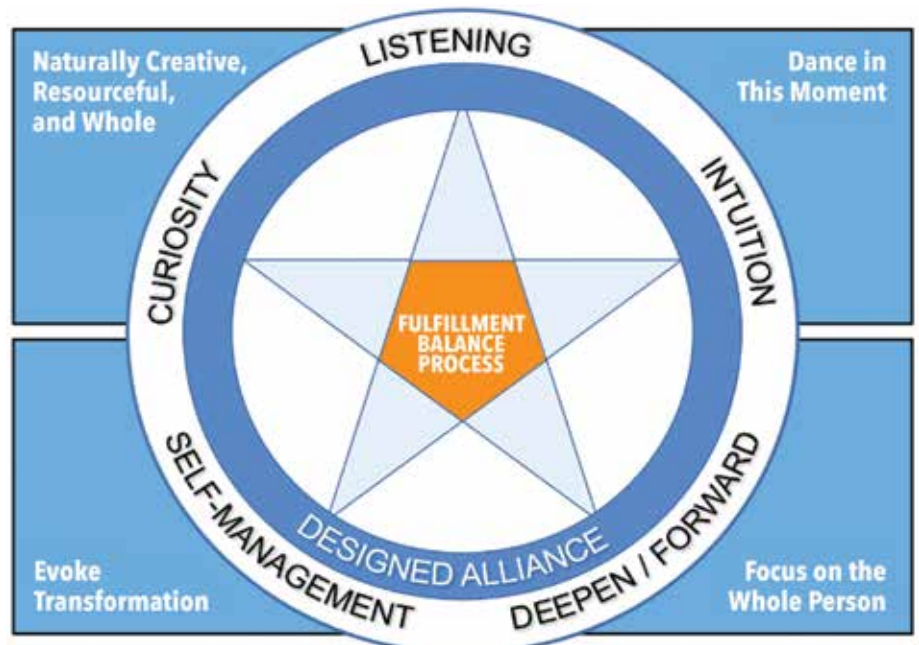
Adopting a coaching culture

Only 7% of communication is in the words we use. The remainder is made up from tone of voice (38%) and body language (55%).

[From detailed experiments of Albert Mehrabian, Psychologist]

Coaching conversations are vital to build trust and change. These can be daily real time feedback sessions or a quarterly catch up. Whatever timeframes are used, positive or negative feedback should be given with good intention. The intention is to aid growth and unlock potential.

The conversation should involve active listening, asking a staff member how everything is going and not interrupting them. Reflecting back what you have heard and not making any assumptions are important. It is important to know what a staff member's personal purpose is. But first it is important to create an environment where the staff member feels they can share this without judgement. Regular coaching conversations help create trust because a staff member feels listened to. By asking more questions than you answer, over time you will



Source: Co-Active Coaching, Fourth Edition, by Henry Kimsey-House et al

notice that people will begin to bring you solutions instead of problems and they will encourage others around them to do the same. (6)

Potential benefits of coaching

- Develop self awareness, confidence and resilience
- Improve direction and focus
- Improve performance and potential
- Develop leadership capabilities
- Successful management of work-life balance (7)

Final thoughts

For me, the primary value of coaching lies within having the space and time for the individual to be truly listened to, without agenda, motive or judgement. I am passionate about the value that coaching can bring – first and foremost to the individual, and therefore also to the organisation. Regardless of who I am coaching in what organisation, what I want most for the coachee is for them to be heard, to be the person they truly are and therefore to thrive, both personally and professionally.

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Denise Hennessey



Denise Hennessey worked as a Medical Scientist in Beaumont Hospital for seven years. She moved to London in 2016 where she now works as a Quality Manager and Executive Coach at the Royal Brompton and Harefield NHS Hospitals. She also runs her own private coaching business. You can contact her at denisehennesseycoaching@gmail.com or visit her website www.denisehennesseycoaching.com



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Dr Catherine Ludden, Director of Operations, COVID-19 Genomics UK Consortium

I am a medical scientist who has spent more than a decade immersed in post-graduate training in microbiology, molecular biology and genomics. Before COVID-19 erupted into the world, my career path was aimed towards what would be seen as the traditional academic trajectory – I had completed my degree, gained a PhD, achieved a Postdoctoral fellowship and had the future ambition of professor. But then in March 2020, I got a phone call that changed everything.

The early career plan

Pathogens are endlessly fascinating and I could have happily spent many a year dedicating myself to delving deeper and deeper into the mechanics of how they evolve and spread. This was my chosen career path. And like many others, I spent considerable time and energy in forging it.

I studied Medical Science at Galway-Mayo Institute of Technology, especially enjoying the module in Medical Microbiology. I was captivated by microorganisms - their diversity in growth, shape and size. The field was evolving with new organisms being discovered and better techniques being implemented for rapid detection. That constant change appealed to me and I knew there was more to discover beyond what I could see under the microscope.

Even though my Bachelors degree in Medical Science was designed to provide the skills required to work in hospital laboratories to diagnose clinical disease and monitor therapy, by chance I was one of just two students in my year who was placed in a research lab for my final year 12-week project. At the time, I felt out of my depth with overly long gene names and performing research techniques that I had only ever read about in textbooks. However, I soon discovered that I really enjoyed applying these research techniques to microbiology. I became engrossed in antibiotic resistance and available research tools, and wanting to know more about how I could track the spread of resistance.

During a year of travelling, I saw a PhD advertised at the National University of Ireland Galway and I decided to submit an application to research the spread of antimicrobial resistant infections in nursing homes. I felt that such a PhD project would combine my various interests - I'd been eager to improve the health of the elderly after growing up surrounded by elderly relatives, and I really wanted to understand how infections were spreading in this population so I could try help improve their quality of life.

In 2014 after completing my PhD, I decided to leave my comfort zone of Ireland

and the network of colleagues and friends I created and applied for a postdoctoral position at the University of Cambridge. That was when I really got into genomics. I started to learn bioinformatics and sequencing techniques, knowing that I had a lot to catch up on. To me, it was just another challenge and I was excited to learn and start analysing genomes. I felt privileged to be working in the home of genome sequencing and I remember the thrill I felt when I created my first phylogenetic trees to track the spread of infections. These were tools I had dreamt about using, but I had limited access to previously.

I was awarded a Sir Henry Wellcome Postdoctoral Fellowship in 2016 which extended my knowledge and expertise in One Health genomic approaches to the spread of antimicrobial resistance. Using a One Health approach, I collected and sequenced samples from livestock, wastewater and hospital patients. This meant working with a wide variety of people – farmers, veterinarians, wastewater specialists, healthcare staff, scientists and patients. I applied the power of genomics to identify transmission routes and used this knowledge to demonstrate effective interventions to minimise the spread of infection.

During my fellowship, I took a six-month secondment at the European Centre for Disease Control and Prevention (ECDC) in Sweden. While working at ECDC, I provided scientific and technical expertise for the analysis and interpretation of European genome datasets and supported international outbreak investigations of antibiotic-resistant infections. I was chairing teleconferences with public health professionals from numerous countries discussing how best we could share, analyse and report outbreak data. I didn't realise it at the time, but this expertise would turn out to be an invaluable introduction to what was yet to come with the pandemic.

A change in direction

In January 2020, I returned to the UK to resume my research fellowship. But then in

March 2020, I got a phone call that changed everything. I heard the words 'Are you in Cambridge? Can you help?' The pandemic had just been declared and I realised the global implications it would have on public health. I didn't know exactly at the time what I would be doing, but I was keen to help and quickly agreed to join the COVID-19 Genomics UK Consortium (COG-UK) team. With my previous experience in medical science, genomics and epidemiology, I was asked to build and lead a team responsible for sequencing COVID-19 samples and tracking the evolution of the virus. As Director of Operations, I knew I had to learn quick, think fast and motivate others. I felt that I had been catapulted into a major leadership role, but I didn't even have time to be scared. I believe that everyone has leadership qualities within them; we need to put fear aside, believe in ourselves, get on with the job ahead and learn as we go along.

COG-UK performed sequencing and analysis of SARS-CoV-2 samples across the four National Public Health Agencies of England, Scotland, Wales and Northern Ireland. This data helped inform the evolution of different variants of SARS-CoV-2 and how those different variants have spread across the nations. With mass testing this was not a simple feat, with much consideration taken into identifying the most urgent samples required to be sequenced, including those from vulnerable populations, healthcare workers and participants in vaccine trials, all of which have direct public health implications. While sequencing was performed, COG-UK also worked tirelessly on developing sequencing methods and analytical tools to be used worldwide, and tracking mutations that could potentially result in more severe disease, reduce vaccine efficacy and the accuracy of diagnostic tests. With changes in protocols, improvements in capacity and through continual monitoring of reporting data, turnaround times for sequencing were reduced and coverage of SARS-CoV-2 increased dramatically across the UK. These targets were achieved while working with healthcare organisations that were under



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immense pressure from the COVID-19 pandemic, shortages in both staff and consumables and line managing large cross-disciplinary teams with conflicting demands.

My working day

My role started as COG-UK Director of Operations responsible for developing operational strategies, coordinating public health investigations, and engaging with technical experts, collaborators and senior leaders on what, how, when and where we should sequence. At the beginning, it started with a mapping exercise – COG-UK had 17 sequencing sites across the UK and I needed to start sending as many positive samples as possible for sequencing and ensure the data was rapidly available for analysis. It required a lot of collaboration, speaking to many different people about logistics and the importance of genomics, while also getting on with the task at hand. Due to the urgency, I went with pace over perfection, but regularly reviewed how we could strategically improve our approach and streamline the process. Throughout this period, I needed to communicate strategic vision that inspired and engaged all involved while ensuring the highest standard of delivery. I thoroughly believe that you are as good as the team around you and I was fortunate to be surrounded by an excellent team of passionate individuals who were dedicated to helping with the pandemic. Developing a diverse and hardworking team, efficient organisation of each day, sharing knowledge, learning and listening to colleagues and reviewing daily, weekly and monthly milestones enabled me to grow as a leader. Like many people worldwide, members of the team were exhausted, hours were long, pressure was high and people were battling with different issues in their own lives, so I think being able to understand that, making everyone feel valued and creating a strong team connection was key to our team approach.

One of my proudest moments in COG-UK was also one of the most challenging. In December 2020, a letter was sent out to COG-UK partners to wish them Happy Christmas and to thank everyone for all their support throughout the year. Within days, we had to send another email asking everyone if they could work over Christmas as we needed them even more than ever. The spread of the transmissible Alpha variant of SARS-CoV-2 made COG-UK's work even more urgent. It was not pleasant asking people to give up their well-earned break over Christmas and it was their response that was truly inspiring. Phones were ringing and emails were pinging with offers to continue sequencing and analyse data over the holidays. The team, consisting

mainly of academics volunteering their time, pulled together to help with the public health response by giving up their Christmas to provide as many sequences as quickly as possible. I was in awe of everybody's response and it made me feel proud to be part of it.

Moving forward, we are now in a position where routine sequencing is being performed by the public health agencies and COG-UK can focus on training, research and combining genomic data with other clinically available datasets for analysis. In 2021, COG-Train, the training arm of COG-UK, joined forces with Wellcome Connecting Science, with the aim of leveraging the genomics sequencing and data management expertise within COG-UK and amongst international partners to deliver a training programme that enhances SARS-CoV-2 sequencing and surveillance around the globe. As Director of COG-Train, I am very excited to share the knowledge in COG-UK and to learn from others through freely available online courses, virtual classrooms and 'train the trainer' courses. By building an online learning community, we can strengthen knowledge sharing and build long-lasting collaborations across the globe.

Tackling impostor syndrome and the impact of role models

Part of the challenge of becoming a senior leader was finding my own confidence to stop doubting my own abilities and to believe in my competence. I work with very senior experts in various fields and it can be challenging as a young female coming in to oversee the process and bringing it all together.

Both my mother and grandmother had pursued careers themselves, and I credit these strong women for shaping my ambitions and for making me believe that anything is possible. My mother decided to go back to undertake a degree at the age of 42 while still running a family business and having 6 children under the age of 20. I watched my mother go to university to study for four years in the evenings – she would finish work at 6pm, then go to university classes until 10pm and then come home. When there are tough times in my career, I reflect on seeing that growing up – the positive attitude and the belief that anything is possible as long as you are prepared to work hard to achieve your goals.

My father's support was a major influence as well as he proudly supported my mother's approach to her career and during an era when women were normally expected to stay at the home to mind the children, my father decided to take on this role. As a result, from an early age, I didn't see that there should be a split between genders, that everybody should have equal opportunity and that

education was fundamental to personal development, growth and confidence.

In June 2021, I set up "Women in COG" which is a supportive network created to share experiences and knowledge and to promote science careers in women and girls. To date, 7 Women in COG events have been held where influential leaders in science have shared their stories. The Women in COG series promotes equality, diversity and inclusion and enables an interactive audience from various backgrounds and professions to ask questions on topics relating to women working in STEM.

Throughout my career, I have been fortunate to have had two exceptional mentors and I would encourage others to seek a supportive mentor. My first mentor was my PhD supervisor Prof. Martin Cormican who provided advice on careers in research and public health. To date, Prof. Cormican remains a close mentor and I value his support throughout my career. My second mentor was my postdoctoral supervisor Prof. Sharon Peacock who inspired me to develop my leadership skills and not to be afraid of uncertainty. Prof. Peacock is an inspiration, particularly to women in science, and her guidance and motivation has shaped my career, aspirations and my perception of success.

Into the future

Reflecting on the last two years, I realise that I have learnt an entire skillset that I didn't have before. I have transitioned from being an independent researcher to now leading a team of exceptionally high performing people with diverse skillsets. I have learnt to do so by creating a dynamic environment to engage, inspire and motivate team members to help them thrive and develop skills which will advance their careers and the success of the project.

I am committed to improving healthcare using genomics, cutting edge science and through strengthening collaborations. These challenging years have been tough but immensely rewarding. I think it is important to choose a career that you enjoy and to share that enthusiasm with others. My career ambitions have changed over time; however, I think it is important not to be afraid of uncertainty and to take opportunities when they come.

My story is far from unique. Many scientists have veered off their career paths or changed their careers completely to support the response to COVID-19, not only changing the type of work that they do, but also the lives that they lead. This inspirational behaviour makes me believe that an important proportion of the young scientific workforce will also be thinking differently about their futures.

And that may prove to be one of the enduring positive legacies of the current pandemic.



Natalia Unrath

My name is Natalia Unrath and I am a graduate of the biomedical science programme at Technological University Dublin (TUD). In my final year, I specialised in microbiology and transfusion science. As passionate as I was about both disciplines, I always knew I wanted my career to focus around microbiology.

My past microbiology lecturers, Dr. Denise Drudy and Dr. Celine Herra were the two brilliant women who sparked my interest for this field. I will be eternally grateful not only for everything they have taught me throughout my degree, but also for choosing a final year project for me which turned out to be an incredible opportunity. This was a research project in the Centre for Food Safety at University college Dublin (UCD) which was supervised by Professor Séamus Fanning. The project was focused on the foodborne pathogen *Listeria monocytogenes*. This is a significant opportunistic pathogen which is the causative agent of listeriosis, a disease which can manifest as a blood stream infection, meningitis or maternal-neonatal infection, with detrimental effects. Despite the low incidence, hospitalisation and mortality rates are high, rendering *L. monocytogenes* one of the most dangerous foodborne pathogens. As part of my research I had to perform whole genome sequencing (WGS) on 150 *L. monocytogenes* isolates which originated from a food processing company. The isolates originated from environmental swabs, cooked meat and raw meat samples. Following on from this, the sequences were analysed using a variety of bioinformatic tools, including typing tools as well as detection of determinants associated with virulence, antimicrobial resistance and biocide resistance. I was delighted with this project as the advancements in molecular methods used in microbiology really fascinated me. The typing tools that I used allowed me to detect persisting clusters of *L. monocytogenes* within the food processing environment. Many of the isolates within these clusters harboured virulence genes, resulting in hypervirulence. I went on to graduate with a 1st class honours degree and Professor Séamus Fanning suggested I continue my research with him as a PhD student, which was an offer I could not

pass up.

As I had the whole Summer ahead of me before restarting my studies, I decided to look around for a locum to get some experience of working as a medical scientist. I had heard from a friend that there were positions in the microbiology laboratory at Connolly Hospital in Blanchardstown so I got in touch with Carol Tiernan, the chief of microbiology to express my interest, explaining that I was looking for a short term position. I ended up being offered a short term contract which suited me perfectly. I really enjoyed working in Connolly, Carol had ensured I got as much training as possible and it was a lovely environment to work in. With the Summer coming to an end, I was returning to UCD to continue my studies from September. However, I didn't want to leave Connolly so I asked Carol if it was possible for me to stay on part-time. This was the first of many times she accommodated me.

My PhD was essentially going to be a continuation of my final year project with a slightly different focus. As this is a Centre for Food Safety, we were interested in investigating the clusters of *L. monocytogenes* found to be persisting within the food processing environment to elucidate the adaptations of these isolates to the food processing environment. This started off with a variety of phenotypic tests such as minimum inhibitory concentrations to sterilisers commonly used in food production as well as assays to assess biofilm forming ability of these isolates. Further work includes the generation of a *L. monocytogenes* evolutionary model, to investigate the effects of exposure to sub-inhibitory concentrations of sterilisers on the resistance to sterilisers as well as biofilm formation of *L. monocytogenes*. This area is of interest as *L. monocytogenes* are often exposed to sub-inhibitory concentrations of sterilisers within food environments due to specific niches such as crevices and the effects of this on the adaptation

of this bacterium remain unknown. I will also be pursuing a metagenomic approach, namely 16S sequencing of samples from a meat fermentation process to detect bacterial populations present at the different stages of this process. At the moment, I am finishing off some laboratory work and writing up my thesis, with the aim of submitting in September of 2022.

I knew it would be difficult to balance a full time PhD and a part-time job but I was really keen on making it work to gain experience. I started off by working a couple of evenings a week where I was given the opportunity to conduct the validation of a new kit to detect the *Clostridium difficile* antigen and toxins. After a few months I switched up my hours again and decided to work 2 mornings per week which gave me some time on the bench. When the Covid-19 pandemic hit Ireland, microbiology laboratories all over the country faced an immense pressure to implement tests for the virus- our laboratory in Connolly hospital was no exception. This was a huge challenge due to the introduction of a new test, reagent shortages and working with reduced staff as we were split into teams in order to minimise spread of the virus. All the while, ensuring other routine services were performed to the same standard. I was able to work more hours during this period due to universities and colleges being closed while the country was in lockdown, expanding my training further. I have a tough few months ahead of me with finishing my PhD and working 2 mornings per week in Connolly hospital as well as picking up additional hours at weekends. I have also recently returned to my roots and started taking part in microbiology laboratory demonstrations at TUD with second year biomedical science students. Although my plate is quite full, I am thoroughly enjoying gaining experience in different fields and learning new skills. I know it will all be worth it in the end.

CPD Updates

Reflective Thinking: The Bigger Picture

So what is reflective thinking? We may associate it with performing CPD. True, but that is a narrow viewpoint? In fact, as Medical Scientists, you are performing reflective thinking all the time. Reflective thinking and critical thinking are sometimes used interchangeably. But is there a difference or are they linked somehow?

Critical Thinking involves a process in several steps. Think about the problems, issues and scenarios that occur in your work on a daily basis. First you identify the problem. Once you narrow it down, it's easier to interpret the problem and find solutions. Let's take an example to demonstrate. This could be a problem with an analyser, QC is out of control, a probe is blocked, etc. You investigate and find that the problem could be due to a number of factors relating to the issue. Next, you analyse and evaluate the data you have found. Now it's important to determine whether these sources are reliable, unbiased and whether they are based on strong data. After a good analysis, you can establish what factors are most important. Then you can make a decision or reach a conclusion based on this data. Does this sound scientific? I think you'll agree that it does and as scientists you use critical thinking all the time. It is your ability to think in an organised and rational manner, understanding the logical connection between ideas or facts. This involves rational and unbiased analysis or evaluation of factual evidence. It's also important to note that a scientist with critical thinking skills will always engage in reflective and independent thinking. They will always question ideas and assumptions and analyse them critically without accepting them at face value. They also identify, analyse and solve problems systematically, instead of by instinct or intuition.

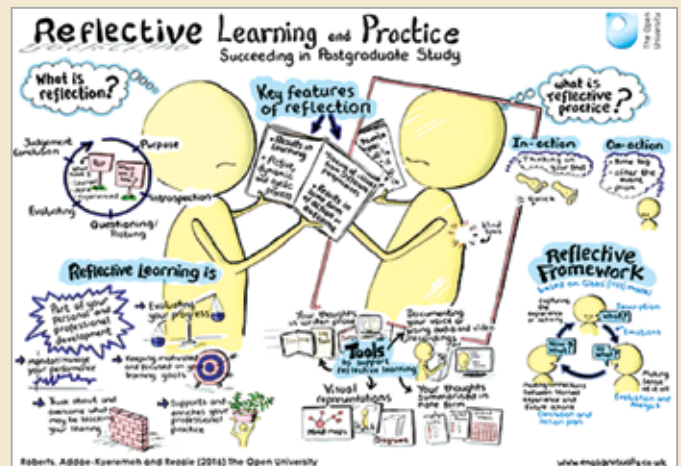


Reflective thinking, on the other hand, is a part of the critical thinking process referring specifically to the processes of analysing and making judgments about what has happened. You are aware of and in control of your learning by actively participating in reflective thinking – assessing what you know, what you need to know, and how you bridge that gap during learning situations, Dewey (1993). Does this sound similar to the CPD reporting template and your PDP?

*"We do not learn from the experience.
We learn from reflecting on the experience"*

John Dewey

Reflective thinking is the process of reflecting on one's emotions, feelings, experiences, reactions, and knowledge, creating connections between them, which leads to learning. In reflective thinking, you have to consciously think about and analyse what you are doing now, what you have done previously, what you have experienced, what you have learned, and how you have learned it. We can also describe reflective thinking as awareness of our knowledge, assumptions, and past experiences. It's our past experiences and learning that create the context of our thoughts.



Therefore, these are unique to us. Furthermore, reflective learning is an active and dynamic process that keeps on developing and evolving as we learn and respond to new experiences, situations, and information. Reflective thinking (adapted from Syed, Scouler and Reaney, 2012)

Reflection makes you a more effective partner, friend, professional, reader, cook, parent, son or daughter etc. It brings a sense of perspective, helping you to zoom out from the small picture to be able to take in a more helicopter-like view of the big picture. It is the pause, the space and the time to digest the learning/habits/challenges or whatever it is that we are reflecting on, that's the magical place where awareness and change can be initiated.

In order to make changes in the right direction, you need to make sure that you have a clear vision of the type of person or professional that you want to become, which also requires deep reflection and introspection. At its core, 'reflective thinking' is the notion of awareness of one's own knowledge, assumptions and past experiences. Your past learning and experience provide the context for your thoughts and are therefore unique to you. Reflective thinking is a dynamic process that continues to develop and evolve as you learn and respond to new experiences, situations, events or information. In practical terms, this is the process where you interpret and evaluate your experiences, check that they make 'sense' to you, create meaning, justify actions and solve problems, and it helps with your future planning.

*"To read without reflecting is like eating
without digesting"*

Edmund Burke

Reflection: Create the Habit & Self-awareness

"Although habits are powerful, what you need is a way to remain conscious of your performance over time, so you can continue to refine and improve. It is precisely at the moment when you begin to feel like you have mastered a skill – right when things are starting to feel automatic and you are becoming comfortable – that you must avoid slipping into the trap of complacency. The solution? Establish a system for reflection and review". James Clear (Atomic Habits, ISBN 9781847941831)

Self-awareness has numerous benefits -- stronger relationships, higher performance, more effective leadership. Traits that many of us desire to become the best possible version of ourselves both personally and professionally. But here's the bad news: 95% of people think that they're self-aware, but only 10-15% actually are. Research conducted by Dr Tasha Eurich, an organizational psychologist, has uncovered a simple tweak that will instantly improve your self-awareness. "Why" questions can provoke sometimes negative and not-solution focused answers, as opposed to "what" questions which can help us to problem-solve and take the emotion out of the situation. To do this, ask yourself some "what"

questions: What's most important to me? What area of my communication/skills/knowledge needs further support? What can I do to ensure that the same error is not repeated time and time again?

Why is Reflective Thinking Important?

Modern society is becoming more complex, information is becoming available and changing more rapidly prompting users to constantly rethink, switch directions, and change problem-solving strategies. Thus, it is increasingly important to prompt reflective thinking during learning to help us develop strategies to apply new knowledge to the complex situations in our day-to-day activities. Reflective thinking helps us to develop higher-order thinking skills by prompting us to a) relate new knowledge to prior understanding, b) think in both abstract and conceptual terms, c) apply specific strategies in novel tasks, and d) understand our own thinking and learning strategies.

"Yesterday I was clever, so I wanted to change the world. Today I am wise so I am changing myself"

Rumi

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James Clear, *Atomic Habits*, ISBN 9781847941831



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National Working Group to inform the Strategic Direction of Laboratory Medicine and Services

As reported previously a National Working Group to inform the Strategic Direction of Laboratory Medicine and Services has been established.

The HSE, while acknowledging the significant contribution of Laboratory Medicine and Services in response to COVID-19 and the level of dedication to support the healthcare system to respond and rapidly mobilise services to meet the needs of patients and the organisation, say it has highlighted the need to examine the strategic direction of laboratory services at a national level to ensure that service developments in the context of population healthcare are inclusive of future demands and are sustainable and scalable. Sláintecare envisages a model of care closer to home. This will require advanced scientific input to be provided in a high quality, accredited manner outside of the traditional laboratory setting. The HSE wish to inform a strategic approach to the development of laboratory services to enable healthcare reform for a sustainable future. This will include career pathways and training programmes to support laboratory medicine to operate to the top of their licence and have opportunities to develop as leaders in innovation and clinical design that will shape the direction of laboratory services. To examine this the Chief Clinical Officer set up a National Working Group to inform the development of a strategic, integrated approach to ensure a sustainable and scalable future for laboratory services.

The Academy was asked for a nominee. Marie Culliton was proposed by Academy Council as our nominee. Marie has a wealth of experience across many disciplines in laboratory medicine. She is the Laboratory Manager at the National Maternity Hospital and past President of the Academy. She will also bring an international perspective to the group as the President Elect of the International Federation of BLS and past president of the European Association for Professions in Biomedical Science. Notwithstanding her experience, she is supported by a multidisciplinary team from the Academy covering the many specialisms in laboratory medicine. The group is overseen by an independent chair Pauline Byron and the aim of the group is to identify and understand existing laboratory service delivery and consider current and future requirements to

support population health and advanced practice in the context of laboratory services. This will assist in informing the strategic direction and training and development requirements.

The group had its first meeting at the end of February. Work Streams were set up to 1) map out current services and structures with a focus on national services to identify and understand the current practice in pathology departments. 2) Consider education and credentialing pathways to support professional development of laboratory staff with a broad-based educational approach that is reflective of their area of competence and expertise and aligned to evolving best practice standards and service requirements. 3) Review of scientific and technologically enabled advances in Laboratory Medicine. 4) Consider relevant international models of care and lessons learned to inform future direction (consider 3-4 international models of best practice that would have similarities to the Irish Healthcare System). This is a very welcome and timely development. Over the past 20 years the focus has been on minimising cost and 'doing more with less'. A review which focuses on strategic direction acknowledging the central role that pathology and laboratory medicine has in acute and population healthcare is long overdue. Medical Scientists stood up demonstrating capacity and innovation during the pandemic. We have always said 'give us the tools and we will deliver'. The National Pathology Programme, together with the laboratory managers in the country, delivered on this promise over the past two years. Capacity for molecular diagnostics in microbiology was implemented and delivered. The instrumentation, currently focusing on Covid, will be available for redeployment and innovation when the pandemic wanes. The competence to develop the service is in our laboratories. We hope that this successful collaborative approach to problem solving and setting direction will provide a blueprint for this review and that the knowledge, skills and competencies of Medical Scientists will be recognised permitting them to work to the top of their licence, ensure programmes are in place for them to reach their potential and have parity of esteem with their other professional colleagues in the laboratory.

Mentoring Programme

The Academy Mentoring Programme has begun. We are now looking for expressions of interest from Mentors for our next group.

Mentor Requirements:

1) Professional Qualification

- Recognised degree with relevant experience will be considered

2) CORU Registration

- CORU State Registered Medical Scientist

3) Academy Membership

- Valid Academy membership number required

4) Knowledge and Experience:

- Mentor candidates must have in-depth knowledge and experience in the area in which they wish to mentor in and be in good professional standing. It would also be expected that each candidate actively participates in various CPD activities. This is dependent on the career stage of the mentor, both advanced and early career mentors are encouraged to apply.
- The skills that an early mentor (<5 years working postqualification) would be expected to include some of the following: interview and job application experience, the experience of attaining CORU registration, attaining a postgraduate qualification, experience of having completed training in their department, experience of starting and participating in an out-of-hours service.

- The skills that a more established mentor (>5 years of experience) should include some of the following: experience applying and interviewing for promotional posts, experience of having attained ACSLM fellowship for qualifications, have attained a postgraduate qualification, are actively engaged in research, have experience in interviewing and training staff, personnel management, lab equipment and stock management, quality and accreditation preparation.
- The lists above are intended to be guidelines and applicants are expected to have attained some of the skills and experiences, not have all skills are not grounds for excluding candidates.

5) Desirable Skills:

- Enthusiasm for Medical Science • Willingness to Teach • Communication skills • Organisational skills • Professionalism

The Academy will provide training for mentors and expects the programme to last up to six months.

Expression of Interest (EOI) form and Mentoring Guidelines are available on the CPD members tab

Queries to: cpd@acslm.ie

Helen Barry

The Future is GREEN

By Wendy Brennan, Specialist Medical Scientist, Galway University Hospital

In early 2020, before SARS-CoV-2 emerged to rule our lives and dictate our every move, another worldwide emergency was the hot topic in the media. Long standing warnings from climate scientists were seemingly finally being heeded in a meaningful way by governments and media outlets alike.

Leading politicians began to speak seriously about ambitions to drastically reduce our carbon economy. News outlets made the editorial decision to begin using the term 'climate crisis', replacing the far more ambiguous and comforting labels 'climate change' and 'global warming'. Where the former labels evoked images of warmer Summers and romantic sunsets, the addition of the term 'crisis' demanded action and response.

My own growing awareness, coupled with UHG winning the 'BIG Switch Off' energy saving award in January 2020 inspired me to 'really' examine my own impact on this beautiful planet we share and how I personally could reduce my carbon footprint. Certain aspects were relatively straightforward to identify and implement change, burning fewer fossil fuels at home, purchasing more sustainably, reducing my energy consumption and so on. However, my workplace, where I spend a vast amount of my regular day was

completely out of my control... or so I thought.

My work environment (a clinical laboratory) was a well-established workplace with procedures and routines in place for many years. But I was disturbed by the fact that as a medical scientist my energy usage was between 5-10 times that of the average office worker. This statistic concerned me and when examined more closely, I uncovered many worrying facts. For example the average Irish person generates 61kg of plastic per year, while the average scientist generates 1000kg (Dr Una FitzGerald, NUIG).

During my research I discovered MyGreenLab®, a US based non-profit company whose mission is to build a global culture of sustainability in science. To my delight they had a plethora of resources and information tailored to laboratory workers who would like to encourage their laboratory to be more sustainable. I completed their Ambassador Program, which is a free online program with access to training videos, assessment, and quizzes. Upon completion, not only did I receive a certificate, but I had gained vast knowledge and insight into how I could initiate a more sustainable workplace, which at the time was the reference laboratory in GUH. As a team, with both laboratory and

hospital management onboard we set about making changes to our work practices with the vision of obtaining green lab status.

However, as the pandemic raged on, this vision was put to the back burner. A more sustainable laboratory was in place, but we would have to wait for the certification. Roll-on two years; the SARS-CoV-2 pandemic may be giving some respite in the form of Omicron but the other crisis still looms ever more precarious by the week, with recent reports on Everest's highest glacier melting at a rapid rate.

I believe that opportunities come along for a reason and should be embraced, and when the opportunity to be the Academy nominee on the European Federation of Laboratory Medicine's (EFLM) Green Labs Task Force arose, I immediately accepted.

The aim of the EFLM Task Force-Green Labs is to implement sustainable practices in medical laboratories, thereby assisting in the EU aim of climate-neutral by 2050 and its commitment to the Paris Agreement.

Following initial contact with the chair of the Task Force, this will take the form of education and information to members on implementing sustainable practices within the laboratory. Educational programmes similar to the Ambassador Program but tailored to the European laboratory will be available and obtaining a Green Certificate will be encouraged for laboratories throughout Europe. This will have a significant impact on Ireland's net-zero target with over 45 clinical laboratories serving our population.

My vision for Irish laboratories is to begin implementing sustainable practices as a matter of urgency and to assist in this, a Green Lab Group will be supported by the Academy. If the past two years has taught us anything – great things are possible if we work together, and only by working together can we combat the climate crisis.



Lt to Rt: Wendy Brennan, Genevieve Devane, Alma Touhy, Stuart Heffernan.

The First Clinical Laboratory in Ireland to Become Green Lab Certified

Greta Domarkaite, Senior Medical Scientist, Virology Laboratory, Irish Blood Transfusion Service.

Did you know laboratories use 10x more energy and 4x more water than office spaces? Plus they create 5.5 million tonnes of plastic waste per year. The National Donor Screening Lab (NDSL) in the Irish Blood Transfusion Service (IBTS) decided to assess their current practices to see if we could become more sustainable. The NDSL includes the Virology, Nucleic Acid Testing (NAT) and Donor Grouping laboratories. In early 2021 we started a sustainability project through My Green Lab (MGL) who initially assessed our current 'green' status and helped us by recommending more sustainable practices that we could implement over time. MGL Certification is considered the gold standard for laboratory sustainability best practices around the world and has been recognised by the United Nations Race to Zero campaign as a key measure of progress towards a zero-carbon future. The certification process allows scientists and their teams to make meaningful change, save money, preserve resources and engage with a movement towards a better future¹.

The process of MGL certification includes:

- completion of a baseline assessment to understand current practices
- making changes by implementing suggested actions
- getting certified by re-assessing laboratory practices and continuing to make improvements based on progress

We began the project by contacting MGL and designating three MGL ambassadors from each section of the NDSL: Greta Domarkaite in Virology, Fiona Young in NAT and Lolita Quinn in Donor Grouping. The three of us become certified Green Lab ambassadors through an MGL training course. An IBTS Green Lab Committee was formed with Scientists, Chiefs, Head of Testing, Facilities Manager, Procurement Manager and Materials management, ensuring input and support from all key departments. Highlighting the benefits of MGL certification helped to get people actively involved in the committee.

Benefits of Certification:

- educating environmental impact of the lab
- Cost Reducing through energy savings
- Focusing on sustainability can give you some great ideas on improving your lab in new ways
- Encourages lab discussions and helps build communication and engagement among the lab and other departments
- Help recruit the next generation of scientist focused on minimising their environmental impact

Next it was time for laboratory members to complete a MGL Baseline survey in March 2021. We scored 45% placing us in the Bronze category of sustainable practice. MGL provided us with a results presentation which in turn helped deliver our initial result to our laboratories. This was supplemented with a report breaking down our score into five main topics of lab sustainability: Energy, Waste, Water, Green Chemistry and Community. Backed with better practice suggestions from MGL, we went to work extensively researching ways to improve this score and, in turn, make the NDSL more sustainable.

On review of our results some of our questions included: 'what can we implement in the NDSL? What is already being implemented? Who can help us make lasting changes?' This is where collaboration and discussion with different departments really came in to play so



Lt to Rt: Fiona Young (Green Ambassador NAT), Lisa Burke (Chief, NAT), Pdraig Williams (Head of Testing, IBTS), Dermot Coyne (Chief, Virology), Greta Domarkaite (Green Ambassador, Virology), Moira Keogh (Chief, Donor Grouping), Lolita Quinn (Green Ambassador, Donor Grouping).

we could get educated on what we currently did as an organisation with our water use, temperature control and energy consumption. We found that many of our practices were already on the way to being sustainable and some of the bigger projects that were suggested by MGL such as changing to LED lights and improving temperature control were already in the pipe-line. Gathering the correct information and educating our labs was one of the biggest challenges but from there we could set our own specific goals.

One of the biggest surprises when undertaking this pilot project was how relatively small changes can add up to very large changes overall. All laboratory staff began working together to turn off computers, lights and centrifuges when not in use, being very aware of segregating laboratory waste and recyclables, reducing plastic and packaging waste and even making an effort to look through our freezers and removing any items that are no longer needed.

The majority of the challenge is cultural change and getting others on-board to doing things different from their usual day to day. Regular meetings, presentations and journal clubs helped us in getting everyone involved, updated and keeping them interested. One of the most difficult parts of the project was getting people from other departments involved in the process, so communication was essential. Making department managers aware of the importance of this project and keeping them engaged by asking for advice and suggestions helped keep the project moving. Green Ambassadors and more sustainable Green Laboratories are a key part of Connections that Count IBTS Strategy 2021-2025 and this really helped push us forward.

Some of the actions and initiatives implemented by the NDSL on the road to becoming more sustainable included:

- Reducing waste by using bulk refill tips, only printing when necessary and always double sided, using a first in first out policy for reagents and consumables and sharing consumables close to expiry.
- Sustainability sign off in our emails to highlight our certification goals to others in and out of the IBTS
- Contact with suppliers requesting reduced packaging, bulk deliveries and take back schemes
- Waste Audit which resulted in new waste SOPs, new clearer signage and education for all staff on the new waste streams



Lt to Rt: Lolita Quinn (Green Ambassador, Donor Grouping), Mayling Chong (Scientist, Virology), Greta Domarkaite (Green Ambassador, Virology), Aideen Duane (Scientist, NAT), Rachel Lambe (Donor Grouping), Helen O'Shea (Donor Grouping), Stephen O'Connor (Virology), Joshua Creighton (Scientist, Donor Grouping).

- Traffic light system for electrical instruments
- Collaboration to further consolidate orders in the NDSL
- Improved freezer cleaning and defrosting, started freezer inventories
- Sharing equipment and cold rooms
- Regular meetings with Green lab ambassadors and committee
- Education on ACT labelling and Green Chemistry
- IBTS Bright Ideas/Green Ideas suggestions form launched

Following nine months of meetings, discussions, implementing actions and education sessions we began our certification assessment. In December 2021 we were awarded 'Green Level Certification' improving our score from 45% to 88%. This meant that we implemented the majority of sustainability practices recommended by MGL. Achieving this level of certification made us the first clinical laboratory in Ireland to become MGL certified. It is our hope to maintain our 'Green laboratory' status and keep the discussion and improvements going.

Future projects to maintain Green Level Certification include:

- Changing Freezer temperatures from -80 °C to -70 °C
- Lab spring clean day, donating unnecessary equipment and supplies
- Taking part in the MGL Freezer Challenge 2022
- Creating a Green Lab handbook from a clinical lab perspective
- Continued Green Lab discussion in every monthly lab meeting

MGL were a great resource and support through the process, answering all our questions quickly and helping us through the process. Thank you to everyone in the IBTS involved in the process of getting certification. Throughout the project we found that when everyone gets involved and backs positive change this becomes part of the culture of the lab. There are many ways to implement sustainability practices and through collaboration and discussion every lab can find little ways to make a big impact.

Source:

1. My Green Lab Certification: A Commitment to Sustainable Science My Green lab. Available online: <https://www.mygreenlab.org/green-lab-certification.html>



Our Green Lab Ambassadors Lt to Rt: Greta Domarkaite, Fiona Young, Lolita Quinn.

New *C. difficile* National Reference service at Cherry Orchard PHL-HSE-Dublin

Clostridioides difficile (formerly *Clostridium difficile*) is a Gram-positive anaerobic spore-forming bacterium that is the leading cause of healthcare-associated gastrointestinal infections in high-income regions of the world. CDI constitutes a significant burden on already stretched healthcare systems so means to prevent and reduce it are paramount.

In August 2021 Antimicrobial Resistance and Infection Control (AMRIC) released an expression of interest for the provision of a reference laboratory for *C. difficile* in Ireland. PHL-Dublin which is already home to the national VTEC and *Campylobacter* reference labs were awarded this tender.

From Oct 2021 we have been accepting *C. difficile* isolates or stools that are PCR positive for *C. difficile*. *C. difficile* toxigenic culture from these stools has been performed and isolates stored for WGS in 2022. Routine WGS for *C. difficile* will



be rolled out in the coming weeks, a little later than planned due to HSE IT issues beyond our control. For each specimen, a *C. difficile* culture report will be generated. A cumulative WGS report for each referring laboratory will also be sent at pre-arranged intervals, this report will include WGS analysis for the specific laboratory and how this data compares with the national picture. Outbreak reports will be sent to

referring microbiologist (and relevant Public health department and HPSC where appropriate), an annual report will also be circulated. An NRL request form can be found on our website <https://www.hse.ie/eng/services/list/5/publichealth/publichealthlabs/public-health-laboratory-dublin/> If you have any queries regarding this service, please call us at 017955175 or email phl.dublin@hse.ie.

Medical Science – what’s it all about?

The Medical Science – what’s it all about? blog stemmed from a discussion about Science Week in 2017 and what we as the Medical Science programme in GMIT, could do to participate. We are passionate about our profession and knew that we wanted to get more information out to the general public about who Medical Scientists are and what we do. So I set up this blog. As a self-confessed technophobe, I surprised everyone by going live with the blog the 16th of November, 2017. Our first contribution came from Helen Cregg who described “A Day in the life of working in a Blood Transfusion Laboratory”.

Since 2017 the blog has expanded to include interesting and informative pieces from both students and lecturers of the programme in GMIT and posts on “A day in the life of...” from medical scientists who are working in the field.

The blog is an excellent resource for anyone interested in Medical Science and for prospective students who want to learn more about our programme and the dynamic profession of medical science, which is central to both patient care and public health provision.

To date the blog has been viewed nearly 16,000 times in over 90 countries which highlights the global interest in our profession. Please find below the link to the blog webpage:

The latest blog entry provides a fascinating insight into the work of a senior medical scientist, Aoife Warde, in the Virology laboratory at Galway University Hospital. It highlights the invaluable contribution medical scientists have made during the pandemic, with COVID-19 testing now being added to all other routine laboratory tests and diagnostics delivered by medical scientists.

Please see below for this latest blog entry from Aoife Warde:

<https://thelifeofamedicalscientist.wordpress.com/home-page/>

If you have any ideas for the blog or if you would like to write a piece, please contact: debbie.corcoran@gmit.ie

(Dr. Debbie Corcoran, GMIT)



A recent blog

My name is Aoife Warde and I am a graduate of the Medical Science degree programme in GMIT. I am now working as a senior Medical Scientist and student coordinator in the Virology Laboratory in Galway University Hospital (GUH).

The function of the Virology lab is to provide a timely and efficient clinical diagnostic service to clinicians investigating infections of a viral aetiology. Put simply, we test patient samples for viral infections! Viruses are of course a hot topic nowadays, thanks corona! However along with coronavirus, we do test for many other viruses such as HIV, Hepatitis and influenza and even some bacterial species that are difficult to culture (grow) in the microbiology department such as the bacteria that cause syphilis and chlamydia.

The Virology lab is broadly divided into two different sections, Serology and Molecular virology.

Serology testing allows detection of specific antibodies and/or antigens in patient samples. Antibodies are produced by our bodies to help us fight off infections. Antigens are molecules either on the bacterium/virus or produced by the bacterium /virus which trigger the immune response and cause antibodies to be made.

Molecular testing allows for the identification of specific bacterial/viral particles known as nucleic acids (DNA or RNA) in a patient's sample. These methods are very sensitive and can detect even tiny traces of nucleic acids. The fragments of the specific DNA or RNA are then multiplied up (amplified) enough to allow for their detection indicating a positive result. This technique of testing is known as the polymerase chain reaction (PCR).

The Virology laboratory in GUH is one of the busiest and most diverse laboratories that specialises in virology in all of Ireland. We are embracing new and leading technologies all the time and are at the forefront of using the exciting new methods of testing that are continually being developed and enhanced. It is vital that we remain flexible, willing to learn and adapt as the need arises and that is one of the main reasons I love it here. No day is ever the same. Let's take today as an example.

Today is a Thursday and I begin work at 8am. I'm testing samples that have been submitted to the laboratory for COVID-19 testing. We are detecting is the virus that causes this infection, SARS-CoV-2. However the Alinity analyser (the machine I use to test the COVID-19 samples) needs maintenance first. There are daily, weekly and monthly maintenance protocols that are performed on the Alinity analyser to ensure that it functions correctly and today both daily and weekly maintenance are due.

Once the maintenance is complete, I check reagents controls.

Controls are samples with a known result which are tested daily. The result should be within a specified acceptable range each day they are tested to ensure the system is functioning as it should. Once all checked and validated, I can begin testing patient samples.

In the specimen reception area they have been busy checking samples and request forms to ensure that all of the details are correct before labelling them with a unique laboratory number and having them entered onto the computer system.

I perform what is known as “lysing the sample” using a special chemical (lysis buffer). This makes the virus non infective making it safe to work with. This step is carried out in a safety cabinet for extra protection. After lysis the PCR is carried out.

The steps of PCR include, extraction (getting the DNA/RNA out of the sample), (the addition of reagents needed to bind with the specific viral DNA/RNA being looked for), and amplification cycles (multiplying up the DNA/RNA found, if any, to a high enough level to detect).

On average we test about 300-400 samples.

A colleague of mine takes over this testing at about midday and I move on to work known as COVID-19 sequencing. Sequencing is when COVID-19 positive samples are further tested in order to see which variant of the virus is present. Sequencing allows us to determine the genome (blueprint) of the virus.

Sequencing is a long process, taking many days in total before a result is obtained. It will take me the rest of the day to get the samples ready for this process.

Sequencing the nucleic acid involves the use of a flow cell method of testing on an Illumina sequencer. Once on the sequencer, the first step in this sequencing technique is to break up the nucleic acids into more manageable fragments. Following some manipulation these will attach onto what's called a 'flowcell' on the sequencer.

The nucleic acid attached to the flowcell is then lengthened and replicated until there are several million dense clusters of specific nucleic acids in a sequence. These are given a fluorescent label which lasers can detect.

The pattern produced by the sequencer upon reading these labels (the virus's sequence) can then be analysed and compared to specific sequences produced by many different strains/ types of the coronavirus to see what variant each patient tested has – or possibly a new variant can be found.

Today's samples are now ready for sequencing tomorrow. It's almost home time for me, I've just enough time to clean up my workspace and check my emails. Tomorrow is a new day and who knows what it will bring.

Kenzi Dickinson, Student Counsellor, and School Representative for the School of Biological Sciences, TU Dublin



Kenzi is a final year Science student, studying in TU Dublin. Whilst studying for the past four years, Kenzi has been heavily involved in college life outside of the course, in areas such as societies and the Student's Union.

During her first year, Kenzi knew that she wanted to get the most possible out of the

college/student experience, whilst understanding the workload of the course. Joining societies was the first step, which quickly catapulted into joining the nationally acclaimed LGBTQ+ Society's committee as the Secretary and she has remained in that position for the three years.

The Student Union (SU) and student voice was always important to Kenzi, with her getting involved almost right away. The nature of the Society in which she was involved

meant SU collaboration was crucial, and so in second year, Kenzi volunteered as Class Representative for the Medical Science course. This involved representing the views of the class, and ensuring they had say in their education, meeting with lecturers and Heads of School to ensure everyone's needs were being met.

As the years progressed, Kenzi was a campaign manager for several college officers during hustings, and finally took the leap this year to become Student Counsellor, and School Representative for the School of Biological Sciences within the college. Not only does this involve the same duties as a Class Representative, but it involves representing the school at college-wide student councils and making decisions for the student body within the institution. Kenzi is looking forward to finishing her final year on a high as someone the school can look to and rely on.

Kenzi is hoping to commence work in a laboratory setting this summer and is eager to transfer the skills that she has learned through these roles into her career.

CALLING ALL 3RD LEVEL STUDENTS



Mary Mulvihill Award

Science Media Competition for Third Level Students

€2,000 Award for Best Work on the theme 'Water'

What makes a relatively simple arrangement of two hydrogen atoms and one oxygen atom – H₂O – so extraordinarily important to our bodies and our planet?

The Mary Mulvihill Association invites submissions to its 2022 student media competition on the theme of Water. Entries are sought from students of all disciplines – undergraduate or postgraduate – studying at third-level institutions anywhere on the island of Ireland.

The Mary Mulvihill Award was established to commemorate Mary Mulvihill, honour her legacy and, at the same time, encourage a new generation of science communicators and journalists to develop their skills.

Mary (1959- 2015) was a scientist with an aim to communicate science. Her mission to highlight women's role in science led to her joining in the formation of Women in Technology and Science in 1990. Her particular interest in women's historical contributions to science is reflected in her editing, on behalf of WITS, two collections of biographical essays on Irish women scientists and pioneers – Stars, Shells

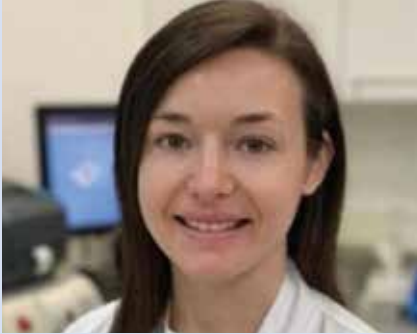
and Bluebells (1997) and Lab Coats and Lace (2009).

The topic of water may be addressed in scientific, environmental, imaginative or other terms. Entries are welcome in many – and mixed – media formats. As examples for guidance, written texts may be essays, memoirs or other narratives. Photos, infographics, comic strips or other visual forms may be used as illustration, or as the main content. Interviews may be presented in written, video or audio forms.

The award is open to undergraduate and postgraduate students enrolled in a Higher Education institution on the island of Ireland at the time of submission. In addition to the overall award of €2,000, the judges may, at their discretion, make an additional award of €500 for a highly commended entry.

For further information on the award, including guidance to entrants and past winners, see <https://marymulvihillaward.ie>. The deadline for submissions is midnight Friday 29 April 2022.

Case Study Winner: Danielle Scally



Danielle, graduated with a BSc. in Medical Science from GMIT in 2013. She then completed an MSc. in Biomedical Science at the University of Ulster in 2014. Following this she began her career as a Medical Scientist in Galway University Hospital in the Division of Anatomic Pathology. In 2020 she completed a post graduate CPD certificate with TU Dublin, in Histopathological Dissection, specialising in skin.

President's Prize 2021 Winner: Julie Twomey

Julie Twomey is a First Class Honours Graduate of Biomedical Science from UCC & MTU, 2020. Julie received the UCC Scholar award each year of her BSc. Studies for her consistent high grades.

Julie was previously awarded a two month summer Student Research Bursary with the APC Microbiome Institute, UCC under the supervision of Dr Des Field. The study investigated the efficacy of the antibiotic Nisin and Genetically modified Nisin derivatives for the treatment of *S. agalactiae* infections, alone and in combination with conventional antibiotics.

Julie's winning research project under the supervision of Dr Helen O' Shea involved the Molecular typing of clinical MRSA isolates, with a focus on the epidemiological trends associated with fusidic acid resistance.

In 2019, Julie was a member of the TIPTOP conference committee at MTU, which organised a student-led conference for all qualified and undergraduate medical scientists in Cork, with the theme of 'Continuous professional development and reflective practise'. Julie also received 1st place in the undergraduate research poster competition at this TIPTOP conference.

Julie thoroughly enjoyed her studies of biomedical science, and hopes to continue her passion for biomedical research in her future career.



St James's Hospital marks 50 years of patient service with Staff Recognition Awards

St James's Hospital has been serving the public at both a local and national level since 1971. To mark the year's celebrations, CEO, Mary Day launched the *St James's Hospital Staff Recognition Awards* to highlight staff's dedication to patient care and high level of collaboration between colleagues to encourage excellence in the delivery of services.



Lt to Rt: Yvonne Lynagh, Chief Medical Scientist (Virology Lab), Mary Day, CEO, Dr Brendan Crowley, Consultant Virologist, Siobhán Crilly, Senior Medical Scientist, Vanessa Mulligan, Senior Medical Scientist, Patrice Keane, Medical Scientist and Denyce Browne, Senior Medical Scientist. Missing from the photo Medical Scientists, Bairbre Ní Laoi, Carmel Roche and Blair Delaney (Virology Lab).



Mary Day, CEO and Dr Brian O'Connell. Photo: Anthony Edwards, Medical Illustration, St James's Hospital, Dublin

Seven different teams and individuals across both clinical and non-clinical areas were awarded an award. Each nomination was reviewed by the selection committee who oversaw the awarding process.

The **Virology Laboratory MDT** was awarded the CEO Award and **Dr Brian O'Connell, Consultant Microbiologist**, was awarded the CEO Outstanding Contribution award. Both recipients were recognised by CEO Mary Day for providing an outstanding contribution by leading and developing projects.

Trinity Innovation Awards

Trinity's leading researchers and inventors were recently recognised for their innovative research and entrepreneurship at the 2021 Trinity Innovation Awards. These were postponed from last year due to Covid restrictions. The headline Provost Innovation Award was given to Prof John O'Leary, Professor of Pathology who leads an investigator group at TCD.

Professor O'Leary, also Consultant Pathologist at St. James's Hospital, and Director of Pathology at The Coombe Women and Infants University Hospital, leads an investigator group, which has established an international reputation in the area of virally driven cancers, particularly cervical, ovarian, prostate, head and neck.

Over the past 29 years John has strived to gain a better understanding of disease processes and how they affect patients. Much of his work has focused on developing "precision medicine", better understanding the molecular pathways in disease, developing a new tool-box of technologies to aid disease discovery, and examining the impact of disease on patients.



Prof O'Leary receives his award from TCD Provost, Dr Linda Doyle

Dr Doyle, said:

"I am delighted to present Prof. John O'Leary with the Provost's Innovation Award. John is one of Ireland's leading clinicians and is absolutely passionate about his research. The technologies that have emerged from his work have changed people's lives".

Using Pebblepad for e-portfolio generation in Medical Science at GMIT

By Helen Cregg & Joan O'Keeffe - Galway Mayo Institute of Technology Analytical, Biopharmaceutical and Medical Science



Helen Cregg and Dr Joan O'Keeffe won a teaching innovation award from LearnSci UK in February 2022 for innovative use of digital tools in science teaching at university level. This award supports innovation that positively impacts on teaching quality and enhances student learning. The Teaching Innovation Awards 2021 are open to university and senior-secondary science educators.

What the judges said:

Very good visual way of evidencing learning for students as they enter a key phase of their career and something that the students can then use after they graduate and into their first professional role.

Winning Project

Completing the 1000 hours of mandatory practice placement as part of Year 3, Medical Science at Galway Mayo Institute of Technology (GMIT) posed many challenges during the pandemic. In the past, evidence of student training on clinical placement involved gathering pieces of information including kit inserts, SOPs, and journal articles in addition to their logbooks and compiling all this into a folder. During Covid, this paper-based evidence was replaced by students generating e-portfolios using the Pebblepad platform. This platform is very versatile, allows students to be creative and is suitable for the upload of a large variety of information in different formats.

To be able to use the software, students received training from the Teaching & Learning office at GMIT and from Pebblepad UK, in conjunction with their course co-ordinators Helen Cregg and Joan O'Keeffe. The students were given the option of using a template for their e-portfolio or creating their own. Students embraced the challenge, with many opting to showcase their creativity in choosing to design their own. Mindful of the guidelines given for this assignment, students uploaded a multitude of different pieces of information which included in-house competency sheets; notes (handwritten or typed and annotated or highlighted); images and videos of work they completed on placement; blogs; and daily records of their training in each discipline. The e-portfolios also contained reflective logs and these were stored in an organised format within. All aspects of their professional experiences on placement were easily captured, and it was easy to link to individual GMIT OneDrive accounts even when using the Pebblepad app on their mobile phones. A discussion forum was available for students to ask questions on Moodle, the virtual learning environment (VLE) in GMIT where owner designed "how to" videos were also available to aid student design and to enable completion of the task.

Helen and Joan will present at the upcoming Horizons in STEM Higher Education Conference 2022 hosted by University College London on June 29th and 30th. They acknowledge the Year 3 Medical Science class of 2020_21 students' work. For further details which includes a video of the completed project, view this link: <https://www.learnsci.com/tia-winners/galway-mayo-institute-of-technology-helen-cregg>



New CEO at HealthTech Ireland

Susan Treacy was appointed CEO of HealthTech Ireland in December 2021. The Academy has worked with the previous CEO Justin Carthy on a number of projects and we were delighted that Susan, a colleague from the lab in Eurofins, was taking over. We are looking forward to working together on projects of mutual benefit.

I recently interviewed Susan.

Q Why did you take on the role of CEO at HealthTech Ireland?

I've worked for about 25 years in healthcare, initially as a Medical Scientist, moving through application, commercial and Senior Executive roles as well as running my consultancy company. I've worked for Med Tech start-ups, SMEs and Global companies. Now more than ever the demands on the provision of diagnostic services are complex, multifaceted and challenging to meet the needs of increasing patient numbers and specialised testing. I took on the role because I have broad experience in the sector, have been a trusted collaborator and importantly I see the challenges through the various lenses. I understand the challenges both the private sector faces in having a system that affords the capability to deliver first class products and services and I understand the challenges within the public sector in firstly trying to deliver daily for patients and at the same time operate and evolve to meet future demands. My hope in taking this role is to facilitate an openness and elevated level of engagement between the private and public sector so together we can further understand the complexities and create the pathways to enable us lead as a nation in this space. I believe fundamentally in the power of open collaboration with common goals and what can be achieved when organisations and sectors move forward together.

Q What are your first impressions of the organisation?

I am thrilled to be taking up this role working at HealthTech Ireland. Forty years ago a group of industry members



created what was Irish Medical and Surgical Technology Association. The organisation evolved into HealthTech Ireland to better represent members across a broad range of products and services in Medical Devices, Diagnostics and Digital Health. I am impressed by the commitment of our members, our board, our working groups and partners to work together to deliver for so many facets of the industry. I am also delighted that HealthTech Ireland is a trusted mediator for meaningful public and private sector engagement to solve industry challenges and ensure the system and in turn patients gain the benefits of the best quality products and services.

Trusted partnerships and collaboration with the public and private sector have been key to HealthTech Ireland's mantra and is important to me. With a complex healthcare ecosystem, HealthTech Ireland must continue to be a trusted partner, source of information and

representative in the sector supported by our colleagues in MedTech EU. There is the capability in the organisation to expand this further into collaborations with initiatives that offer value to the sector. I am delighted that in addition to the wonderful partnerships that already exist, for example with the ACADEMY and the Innovation Hub Ireland, in 2022 we will be working on the Ireland Digital Health Leaders Steering Group, with Convene - a government initiative with TU Dublin and UCD working around skills, and the reputable WiFOR Institute gathering research and data on the Irish Health economic status with a view to better understand how products and services implemented in an effective way can provide better value.

Q How has the sector been changing?

Globally we are in the 4th revolution, and healthcare is no exception. Pre-pandemic the pace of change

happening in terms of moves to value based outcomes and increased use of technology to diagnose and treat higher patient numbers was steady. Technology provided ground-breaking solutions such as surgical robotics and digital radiology and pathology connecting disciplines to provide a more effective, multi-disciplined approach. The pandemic rapidly accelerated this evolution. The move to remote working, creation of new pathways and rapid adoption of digital solutions demonstrated how agile our sector, both private and public could be in not just creating and delivering the solutions but also creating the means to have the solutions positively impact the sector and patients in terms of value. It is important that HealthTech Ireland continue to work with members and partners to ensure we continue to facilitate adoption of safe and effective solutions into the system.

Q When it comes to the HSE and health delivery, what have we learned or gained from the pandemic?

The pandemic amplified the best of the public and private sector and what can be achieved together. The Academy and HealthTech Ireland members have worked together in the past. There is a symbiosis where industry supports the provision of products, services and skills that provide the capability for the HSE to deliver what they need for patients. This was never highlighted more than at the start of the pandemic when there was a need for rapid, safe scale up and training for testing for Covi-19 analysis. Member companies secured testing capability for Ireland in terms of instrumentation and kits. The baton was then taken up by the teams in the HSE alongside the industry's engineers and scientists who together worked tirelessly to create the capability and capacity to test for covid in unprecedented uptimes. It was this trust, collaborative spirit and hard work that delivered for the system.

Ultimately, what I think we have learned is that with willingness, engagement and frameworks that can be agile depending on circumstances, the public and private sector can implement new solutions in a safe and timely way that offer optimum value to the system. With healthcare evolving

Healthtech Ireland are delighted to continue to facilitate engagement around this with members and HSE teams to support enhanced pathways and capability not just in a crisis, so we as a country can lead the way on this.

Q How much has surprised you?

I have worked in many facets of healthcare and so to be honest not much surprises me. The scale of the sector is broadening and new entrants growing. I am hugely encouraged by the solutions offered by established companies and start-ups. I am also encouraged by the move for increased public/ private engagement to help patients access these solutions for example with the Enterprise Ireland, HSE digital steering group, the Health Innovation Hubs and of course HealthTech Ireland.

Something again that is not so surprising as much as encouraging is the continued high level of connectedness and trust at the ground level between our member's scientists, IT and engineering teams and the hospital technical teams. Having worked in Pathology laboratories both as a Scientist and as an industry technical support I have first-hand experience of this. Indeed, it was while working on the bench I met my husband who was an engineer. What is wonderful though is how these teams pulled together in the pandemic and again with the HSE cyber attack working side by side to deliver for our healthcare system and patients. That level of dedication and trust while certainly not surprising from these teams, was unprecedented in what was achieved rapidly and safely for patients. It will be beneficial that we take these positive lessons forward and emulate them throughout all levels of engagement.

Q What happens next?

HealthTech Ireland must continue to be a trusted mediator between the industry members and our public system colleagues and to represent the members and what the sector needs. It's an important year as HealthTech Ireland enters it's 40th year representing Medical Device, Diagnostic and more recently Digital Health companies so it will

be a big year for members. We will have a programme of breakfast briefings around topics of interest from economists to MDR/IVD to sustainability. This month we celebrate the 2021 winners of our Health Technology Innovation Awards with a members and partners event – the first in person since the pandemic. Our Annual Conference in May 'Connecting for Health Transformation' will bring our members and stakeholders together from start-ups, to SMES, to global companies and the public sector across the spectrum of Devices, Diagnostics, Community Care, Surgical and Digital Health interests under an agenda that we hope will stimulate and progress the narrative on all aspects of this topic and in summer we will be doing our annual call for submissions for the 2022 awards.

Operationally, in response to our member's survey we will continue to work hard to meet member's needs and support them through the challenges that exist for their organisations. We will continue to work in partnership with our European equivalent, to communicate developments on a global scale and also ensure Ireland is active at a European Level in the MedTech space.

We will continue to invest efforts in highlighting the fantastic emerging products and solutions across all sectors of healthcare. Our recent awards submissions, shortlist and winners demonstrate as a nation we have the knowledge, experience and technology to elevate how the job is done and the importance of continued open public/private collaboration to enable these solutions reach patients.

Also, as the healthcare landscape evolves, HealthTech Ireland will continue to actively collaborate and participate with partners to support the transformation and shaping of the future of healthcare both Nationally and Internationally as reflected in our annual conference in May 'Connecting for Health Transformation'. We look forward to supporting our public sector colleagues in this endeavour.

And for me personally for 2022, I look forward to working with all of my colleagues across the sector in this new role. I have seen at every level, in both sectors what can be achieved and I am extremely proud to take up the baton now to support this.

Helen Barry

Dr James O'Connor "MOVING TO ACADEMIA"



James has recently taken up a position as Assistant Lecturer in Munster Technological University, Cork in Biological Sciences. He carried out his undergraduate

and postgraduate studies under the CIT banner, completing his PhD there under the supervision of Dr Brigid Lucey. His PhD focussed on identification and typing of Mycobacteria. The first part involved validation of MALDI-tof as a tool for identifying clinical mycobacteria, a part of this study involved a pan-European consortium examining various extraction protocols. The latter half of

his research focussed on ascertaining the power of a proteomic approach to typing M.tuberculosis, exploring the efficacy of MALDI-tof as a typing tool to facilitate real-time epidemiological typing of M.tuberculosis.

He says he is "excited to be teaching the next generation of scientists and pass on some of the knowledge I've gleaned from my previous roles and training".

James has just taken over as chair of the Engagement and Advancement Advisory Body from Hayley Foy Stones. This is a very active Advisory Body supporting early career scientists and key to the delivery of the Academy's mentoring programme.

James was a Specialist Medical Scientist in Microbiology (Molecular) and prior to this a Senior Medical Scientist and Medical Scientist,

all in the busy and progressive Microbiology Dept in the Mercy University Hospital in Cork. He says "it was a real honour to be part of team Microbiology of the Mercy, especially during the COVID-19 pandemic, where teamwork and dedication to the patient were to the fore. This resulted in huge positive advances within the department".

He is looking forward to new challenges in teaching and research in Cork's newest University. He plans to conduct and progress research in the areas of Clinical Microbiology in his new role, whilst remaining active in the Medical Science community through my involvement with the Academy, including the Engagement and Advancement Advisory body. You'll hear from us soon with some upcoming events for 2022.

Michele Amoruso "MOVING ON UP"



Michele Amoruso (Mick) qualified as a BioMedical Scientist back in the early 80's from the University of Wales (South Glamorgan

Institute). In those days, automation was in its infancy and the word SMAC was very familiar to those old enough to remember!

His laboratory training and early experience was gained at the University Hospital of Wales, Cardiff. After qualifying as a BioMedical Scientist (clinical chemistry), his first move was to London, where he worked in a busy Biochemistry department, for Riverside H.A., at St. Stephens Hospital (now called Royal Chelsea Westminster). This was a general hospital which also treated and cared for patients suffering from

HIV and related infections.

After two years to be nearer family, he moved back to his homeland of Wales, where he was employed to work in the Biochemistry department at the Royal Gwent Hospital, Newport.

On the move again: In 1989, Mick took on the post of bioMedical Scientist with Swansea NHS Trust. It was here that he gained promotion to Senior and embarked on an adult teaching qualification (PGCE) and subsequently took on the role of training officer for the laboratory, training student laboratory scientists and was instrumental in developing an in-house, training programme for laboratory assistants and undergraduate students.

Following his heart, the next move was to Ireland in 2000 to take on role as quality officer/ senior Medical Scientist, for a Dublin maternity hospital. It was here he engaged with the cross-Maternity Alliance in preparing for laboratory accreditation.

In 2009 he moved to the National

Orthopaedic Hospital Cappagh as a senior Medical Scientist in the biochemistry laboratory, where the focus was initially preparing the Biochemistry department for ISO 15189 laboratory accreditation. Whilst here he gained his MSc in Biomedical Sciences through the University of Ulster. He continues to work in the multidisciplinary laboratory developing and streamlining the service to meet the needs of its users, before his next move, taking on his new role as Chief Medical Scientist in the Mater Misericordiae University Hospital, Dublin.

Mick has seen many changes in laboratory medicine throughout his career and has encountered many new challenges, which he believes contribute to making us the scientists we are today. A career as a Medical Scientist has paid its rewards and given him inspiration over the years and he hopes that he can inspire a new generation to follow.

The role of the Medical Scientist as part of the multi-disciplinary team

Helen Keller is quoted as saying “alone we can do so little; together we can do so much”. This is also true with regards to patient care and diagnosis of disease. Provision of healthcare is a complex arena that requires the involvement of many professionals, with Medical Scientists playing a fundamental part of that multi-disciplinary team (MDT).

A Medical Scientist is a state registered Scientist who works in healthcare. The main role of a Blood Transfusion Medical Scientist is determining patient blood groups, identification of the presence of atypical red cell antibodies and identifying the significance of these antibodies for the patient with regards to either pregnancy or transfusion. Another key aspect of the role is the provision of appropriate blood and blood components for patient transfusions whilst ensuring the appropriate levels of blood stocks are adequate for emergency situations such as major haemorrhages.

Historically, Medical Scientists were often thought of as purely laboratory based with interaction with the patient clinical team limited to phone calls. However, these phone calls were the starting point of a better interaction with Medical Scientists and the realisation that the Medical Scientist would be an important member of the MDT. The Blood Transfusion Medical Scientist is often requested to be present in MDTs such as transplantation, obstetrics,



major haemorrhage and trauma review.

The Blood Transfusion Medical Scientist is invited to MDT meetings because of their expertise in Blood Transfusion serology, its interpretation and significance as well as the practicalities of ensuring timely provision of blood and blood components. The MDT also allows the Blood Transfusion Laboratory to be aware of and prepare for the arrival of patients with specific transfusion requirements which would otherwise have taken significant time to prepare. Benefits to the patient include a safer and more organised level of care as the laboratory is made aware of these patient requirements that were discussed at the MDT.

In Ireland, a new national clinical guideline has been released “Unexpected Intraoperative Life-Threatening Haemorrhage” and one of the key recommendations is that there should

be a case review by a wider team post unexpected life threatening haemorrhage to include the Chief Medical Scientist.

When we think of MDTs we think of formal meetings where the whole team are present however MDT working can happen within a smaller group with the Medical Scientist being asked for guidance for particular situations such as major haemorrhage. As a consequence of Medical Scientists participating in MDTs the communication has now gone full circle with increased phone calls to the laboratory as the patient’s clinical team want the Medical Scientist’s advice on particular patients.

As a Medical Scientist, the role within the MDT is one based on collaboration, respect, and in-depth understanding of the internal processes and structures within the laboratory and wider hospital departments. This knowledge creates a dynamic Medical Scientist, one who can connect and communicate effectively and efficiently to the necessary MDT members in order to support effective patient care. This is a critical component and undoubtedly plays a key role in improved patient outcomes.

Carol Cantwell, Mullingar Regional Hospital,

Fergus Guilfoyle, Coombe Women and Infants University Hospital,

John Quigley, Mullingar Regional Hospital.

Academy Bursary



Source pxhere

Many medical scientists in Ireland (at all stages of study and career) are involved in very noteworthy research that is deemed of publishable quality. Unfortunately, Medical Scientists are not typically actively encouraged to pursue publication on completion of their research for work. In order to encourage more research and both presentation and publication of work, the Academy offers bursaries to members. These bursaries are a form of support for those members presenting their research at international meetings, whether with a poster or presentation of their work.

Last year we introduced a case study competition. Although we were disappointed with the numbers of entries, we were delighted with the high quality of the work. Congratulations to Danielle Scally from UHG, who was our winner. We plan to offer those again in 2022.

We also propose to set up a bursary scheme to support those undertaking post graduate studies in an area relevant to laboratory medicine but is over and above post graduate studies required for promotional grades. We would like to support those that can enhance the role of medical scientists. Our Council is considering how this could best be rolled out.

Publication fees are now a common feature of many peer-reviewed journals. In addition to this, publication fees remain a hurdle for researchers, as medical scientists may not be able to access funding from their employer or academic institution to help afford publication. The Academy is considering a bursary fund to off-set the cost of publication fees. This is to encourage medical scientists to consider publication of their research which will in turn showcase the strong research capabilities of medical scientists in Ireland and their contribution to applied medical research.

Further details of our bursaries will be posted on our Website www.acslm.ie

Beckman Coulter renews its partnership with the Irish Blood Transfusion Service to continue its unique high quality and high throughput Primary Blood Group screening service

Dublin — Beckman Coulter, a global leader in Clinical Diagnostics, has announced that it will be continuing its partnership with the Irish Blood Transfusion Service, moving the collaboration forwards with the installation of Beckman Coulter's newest automated microplate system.

The Irish Blood Transfusion Service (IBTS) is the statutory entity responsible for national blood supply in Ireland. Beckman Coulter's, newly released, donor testing analysers, the PK7400s, will be installed in the National Blood Centre in Dublin - a centre that welcomes 150,000 donors every year. The partnership, which has already been in place for over a decade, will, with new equipment, run for an initial period of 5 years, with a 2-year extension option available.

"We are excited to begin validating Beckman Coulter's PK7400 in the Irish Blood Transfusion Service. The PK7300 were robust instruments with an incredibly high throughput of 300 samples per hour. The PK7400 promises to match or exceed this throughput while delivering the same robustness we are used to with the PK7300," said Moira Keogh, Chief Medical Scientist, Automated Donor Grouping at the Irish Blood Transfusion Service.



The IBTS supplies hospitals in the Republic of Ireland with blood and blood products 365 days a year. In 2022, approximately 70,000 patients will have transfusions in Irish hospitals, meaning over 1,000 people every week. Blood is required for much of the services the Irish health system provides. For example, a car accident victim may require up to 30 units of blood, a bleeding ulcer could require anything between 3-30 units of blood, or a coronary artery bypass may use between 1-5 units of blood. A typical unit of blood lasts for just 35 days, but in some cases such as blood used for very young children, this blood must be used within 5 days of its collection.

The PK7400 Automated Microplate System delivers the industry's highest throughput on the market at 300 samples per hour, providing an easy-to-use software interface, streamlined maintenance, and remote connectivity to simplify laboratory workflow, maximise productivity and strengthen confidence in operational performance and results reporting. The PK 7400

continues to provide total confidence in the Primary Blood Group screening process to ensure patients receive their blood safely.



Rob Young, Ireland and UK General Manager for Beckman Coulter, added: *"We are proud to continue to support the IBTS with Beckman Coulter's 3 decades of demonstrated market leadership in blood bank donor centres worldwide. Delivering peace of mind and analytical confidence, the PK7400s will be used for every blood donation in Ireland, to assign an ABO, RhD, extended Rh phenotype, antibody screen and high titre A/B result."*

For more information regarding Beckman Coulter's full suite of solutions for blood banking analysers, visit: <https://www.beckmancoulter.com/en/products/blood-banking>

About Beckman Coulter

Beckman Coulter is committed to advancing healthcare for every person by applying the power of science, technology and the passion and creativity of our teams to enhance the diagnostic laboratory's role in improving healthcare outcomes. Our diagnostic systems are used in complex biomedical testing, and are found in hospitals, reference laboratories and physician office settings around the globe. Beckman Coulter offers a unique combination of people, processes and solutions designed to elevate the performance of clinical laboratories and healthcare networks. We do this by accelerating care with a menu that matters, bringing the benefit of automation to all, delivering greater insights through clinical informatics and unlocking hidden value through performance partnerships. A company operating within the Danaher Corporation (NYSE: DHR) since 2011, Beckman Coulter is headquartered in Brea, California, and has more than 11,000 global associates working diligently to make the world a healthier place.

Contact
Maria Paccagnani
European Public Relations
Beckman Coulter Diagnostics
MPACCAGNANI@beckman.com
+ 351 910 214 040

Mayo University Hospital partners with Beckman Coulter to achieve full laboratory automation



- Mayo University Hospital is a 300-bed, Model 3 Acute Hospital located in Castlebar. The hospital services a large geographical area, including in excess of 100 GP practices, a 24-hour A&E department and obstetrics.
- Like many hospitals, Mayo University Hospital has faced the challenges of an increased workload (over 2.5 million tests/year) combined with recruitment difficulties and space restrictions. Laboratory automation proved to be a turning point for the institution.
- Beckman Coulter has provided Mayo University Hospital with the first DxA 5000 in Ireland, guaranteeing total laboratory automation in Clinical Chemistry and Immunoassay.

Mayo University Hospital sought a fully automated solution for Clinical Chemistry and Immunoassay that would be able to grow, keep up with future capacity needs, and provide them with total process improvement opportunities. In providing a comprehensive menu and high throughput analysers, Beckman Coulter has opened avenues through which the laboratory is able to repatriate tests that would once have been sent to other sites.

"As a profession we inspire to deliver an efficient service but this can be challenging with increasing service demands, recruitment difficulties and space limitation. We have been collaborating with Beckman Coulter for over 20 years and now they have provided us with an impressive automated solution within a reconfigured current laboratory space. This allows us to continue providing an efficient service to our users and has given us the scope to expand our services. We are delighted to continue our relationship with Beckman Coulter, having signed a long term contract with them to guarantee the latest in laboratory technologies for Ireland," said Ray Divilly, Chief Medical Scientist at

Mayo University Hospital.

An in-depth, consultative approach between the laboratory and Beckman Coulter's Project Management, Sales and Applications Teams has led to the design and development of a future-proof solution. This comprises the latest generation of automation; DxA 5000, AU Clinical Chemistry analysers and Dxl immunoassay analysers, underpinned by Beckman Coulter's Remisol Advance Data Manager.

Research shows that errors in the pre-analytical phase of testing may contribute up to 75% of erroneous test results, with 26% possibly having an adverse effect on patient care. Moreover, a vast majority of the factors that cause erroneous results take place outside the laboratory, including inadequate volume, mislabelled samples

and incorrect tube types. Beckman Coulter's DxA 5000 enables hospitals like Mayo University hospital to achieve a new standard in turnaround times using comprehensive quality detection, providing the most cost-effective, reliable, and innovative lab automation product on the market.

"We are excited to partner with Mayo on this transformative project and to support our customers in meeting their objectives. The DxA 5000 is a key component of Beckman Coulter's vision that every laboratory should be able to harness the benefits of automation, no matter their size" said Tom Coulson, EU Product Marketing Manager - Workflow & IT Solutions.

Laboratory workloads are growing quickly, with a 66% increase in healthcare consumption per capita since 2000. With the DxA 5000's intelligent route scheduler, which dynamically calculates the most efficient routes for all samples, laboratories have reported turn-around time reductions of up to 25%. The DxA 5000 helps laboratories meet today's challenges by collecting patented innovations that deliver fast, consistent turnaround times, provide a new level of comprehensive preanalytical sample-quality detection, and reduce the number of manual processing steps, therefore significantly improving laboratory efficiency.

For more information regarding Beckman Coulter's full suite of solutions for automation, visit: beckmancoulter.com/en/products/automation



About Beckman Coulter

Beckman Coulter is committed to advancing healthcare for each individual by applying the power of science, technology and the passion and creativity of our teams to enhance the diagnostic laboratory's role in improving healthcare outcomes. Our diagnostic systems are used in complex biomedical testing, and are found in hospitals, reference laboratories and physician office settings around the globe. Beckman Coulter offers a unique combination of people, processes and solutions designed to elevate the performance of clinical laboratories and healthcare networks. We do this by accelerating care with a menu that matters, bringing the benefit of automation to all, delivering greater insights through clinical informatics and unlocking hidden value through performance partnerships. A company operating within the Danaher Corporation (NYSE: DHR) since 2011, Beckman Coulter is headquartered in Brea, California, and counts on more than 11,000 global associates who are working diligently to make the world a healthier place.

Celebrating the Best in HEALTH TECHNOLOGY INNOVATION

HealthTech Ireland's Health Technology Innovation Awards took place virtually for the second year in 2021.

They are Ireland's only awards programme focused entirely on the medical devices and health technology sector. They demonstrated the agility our sector has in pivoting to meet the healthcare needs of our patients, particularly in the pandemic.

Once again, the judging panel was inundated with high quality entries across the ten award categories. The award categories are chosen to best reflect the priorities of the sector and the wider community. Of particular significance was not only the fact that 2021 had the highest number of submissions to date for the awards but notably the high number of entries, finalists and winners that featured collaborations between public and private sector organisations.

It demonstrates how much of Irish Healthcare products and services are being delivered and transformed through an openness and spirit of cooperation and collaboration between the public and private sector in healthcare.

We are delighted to highlight the ten winners here:



INTEGRATED CARE AWARD

Winner: Beaumont Hospital

Sponsor representative, Tom Reynolds from Change Healthcare presents winners Prof. Conall O'Seaghdha and Olive McEnroe, Beaumont Hospital with their awards for their Smart triage for kidney transplant patients.

SPONSORED BY:



OUTSTANDING CONTRIBUTION TO INDUSTRY AWARD

Justin Carty

Justin Carty was awarded with an Outstanding Contribution to Industry Award for his tireless efforts on behalf of Industry and HealthTech Ireland. Wishing Justin all the very best in his next chapter.



CLINICAL ENGINEERING HEALTHCARE TECHNOLOGY SUPPORT AWARD

Winner: Oxygen-Care

Sponsor representative Eoghan Hayden from BEAI, presents winners Etáin Moran and Joseph O'Neill, Oxygen Care with their award as the leading technical services support company 2021.

SPONSORED BY:



SUSTAINABILITY AWARD

Winner: TriMedika /HSE Digital Transformation

Sponsor representative, Marion Briggs from HealthBeacon presents winners Dr Roisin Molloy and Prof Martin Curley, Trimedika/HSE Digital Transformation with their awards for Tritemp non-contact Thermometer.

SPONSORED BY:



EDUCATION AND TRAINING AWARD

Winner: Smith & Nephew

Sponsor representative, Prof Thomas Kearns, from RCSI Faculty of Nursing and Midwifery presents winners Mary Claire Owens and Barry Heaton, Smith and Nephew with their awards for their WoundClub and Education Programme.

SPONSORED BY:





BEST HEALTHCARE INNOVATION PILOTED IN AN IRISH HEALTHCARE SETTING AWARD

Winner: Yellow Schedule

Sponsor representative, Dr Jenny Gannon from Health Innovation Hub Ireland presents winners Martina Skelly and Michael Skelly, Yellow Schedule with their awards for the Hospital Visitor Management Platform.

SPONSORED BY:



2022 SHORTLISTED NOMINEES

The calibre of the submissions were excellent and selecting winners challenging. It is important to congratulate the shortlisted organisations across the ten award categories. **Please see the short list here:**

- + Arjo Ireland
- + Baxter Healthcare
- + Beaumont Hospital
- + Boston Scientific
- + Cavan Monaghan Hospital, RCSI, National Medical Devices Office, DPIP, Syncrophi, HiHi, HSE Digital Transformation and Open Innovation Office
- + Digital Gait Laboratories and Tallaght University Hospital
- + Draeger Medical
- + Dundalk Hospital
- + Galway Roscommon Child & Adolescent Services
- + HSE & Deloitte Samplepath
- + HSE Access to Information
- + ICON
- + Medtronic
- + Our Lady Of Lourdes Hospital Drogheda and Louth County Hospital
- + Oxygen-Care
- + PMD Solutions, Digital Transformation and Open Innovation at HSE
- + Salaso Health Solutions
- + Smith & Nephew
- + Syncrophi, HSE Digital Transformation and National Medical Device Office
- + Swiftqueue and HSE A21 Healthlink
- + T-Pro
- + TriMedika Ltd / HSE Digital Transformation
- + Uniphar plc
- + Wassenburg Medical
- + X wave
- + Yellow Schedule



PATIENT SAFETY AWARD

Winner: Syncrophi, HSE Digital Transformation and National Medical Device Office

Sponsor representative, Jack O'Beirne from Mangan O'Beirne Solicitors presents winners Colm Connell and Ger Duignan, Syncrophi, HSE Digital Transformation and HSE National Medical Device Office with their awards for KEWS Integration.

SPONSORED BY:



eHEALTH / DIGITAL HEALTH AWARD

Winner: HSE & Deloitte Samplepath

Sponsor representative, Thomas Sharkey from AWS presents winners Gillian McMahon, Noreen Curtin and Grainne Ryan HSE and Deloitte SamplePath with their awards for the SamplePath App.

SPONSORED BY:



HEALTHCARE COLLABORATION AWARD

Winner: Galway Roscommon Child & Adolescent Mental Health Services

Sponsor representative, Redmond O'Leary from InterSystems presents winners Niamh Morrin & Fiona Mulvey, Galway Roscommon Child Adolescent Mental Health Services with their awards for the Dala Project.

SPONSORED BY:



INDIGENOUS SME MOST INNOVATIVE PRODUCT AWARD

Winner: Salaso Health Solutions

Sponsor representative, Anne O'Donoghue from Enterprise Ireland presents winners Aoife NiMhuiri, Salaso Health Solutions with their awards for myHealthyBody.

SPONSORED BY:



MULTI-NATIONAL MOST INNOVATIVE PRODUCT AWARD

Winner: Arjo Ireland

Sponsor representative, Anne O'Donoghue from Enterprise Ireland presents winners William Dorrian and Kieran Driver, Arjo Ireland with their awards for the Provizio SEM Scanner.

SPONSORED BY:



Thank you!

We must also acknowledge the award sponsors who in making these awards possible, continue to invest in our healthcare sector by enabling us highlight the best of what our sector can offer. We would also like to thank our members and partners, including the ACSLM in continuing to work to facilitate the continued support of our healthcare service.

We look forward to seeing and networking with members and partners at our **Meet the Winners** event in March. Hosted at the Burlington Hotel, Ballsbridge, we will celebrate the wonderful talent and best in health care innovation.

www.healthtechireland.ie

Academy Case Study Award Winner - Danielle Scally, Division of Anatomic Pathology, University Hospital Galway

An 82-year-old female presented with a painless, ulcerated, exophytic lesion on the left posterior calf, which had rapidly increased in size. Her medical history noted that she had a previous history of sun exposure. A large, orientated piece of skin was excised, with wide margins (Figure 1).

Histology revealed an ulcerated epidermis with nests of markedly atypical squamous cells and an underlying infiltrative small, round, blue cell tumour (Figure 2). The tumour measured 17mm in greatest dimension and had a thickness of 3mm, extending into the reticular dermis. The squamous component was characterised by nests of pleomorphic cells with focal keratinisation (Figure 3). The small, round blue cells demonstrated "salt and pepper" granular chromatin along with nuclear moulding (Figure 4). There was increased mitotic activity at a rate of 40/mm². Multiple foci of lymphovascular invasion were observed (Figure 5). The surgical margins were uninvolved.



Figure 1: Macroscopic gross image of the orientated skin specimen with a central lesion

Immunohistochemistry (IHC) for EMA and CK7 was positive in the squamous cell component. The blue basaloid cells were positive for neuroendocrine markers synaptophysin, chromogranin and NSE. CAM 5.2 and CK20 were expressed in a dot-like pattern. Importantly, the tumour stained negative for TTF1, MelanA and CD45 (Figure 6).

The final diagnosis was primary neuroendocrine carcinoma (Merkel cell carcinoma) with an overlying well differentiated squamous cell carcinoma. The tumour was staged as pTNM AJCC 8th: pT1. The oncogenic polyomavirus (MCPyV) was not tested for in this case.

The patient's case was discussed at a multidisciplinary team

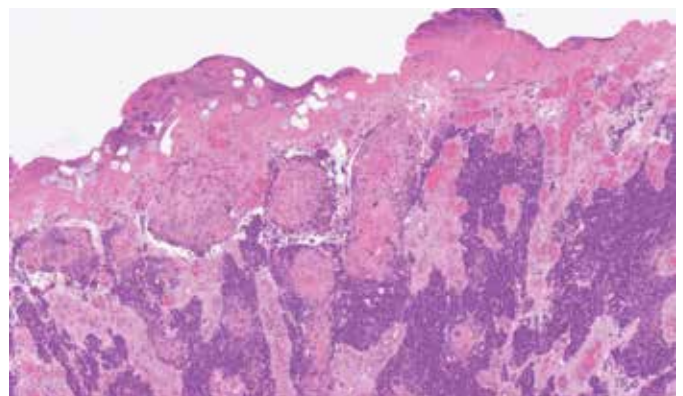


Figure 2: Ulcerated skin with nodules of squamous cell carcinoma (long arrow) and underlying Merkel cell carcinoma (short arrow) (H&E 2x).

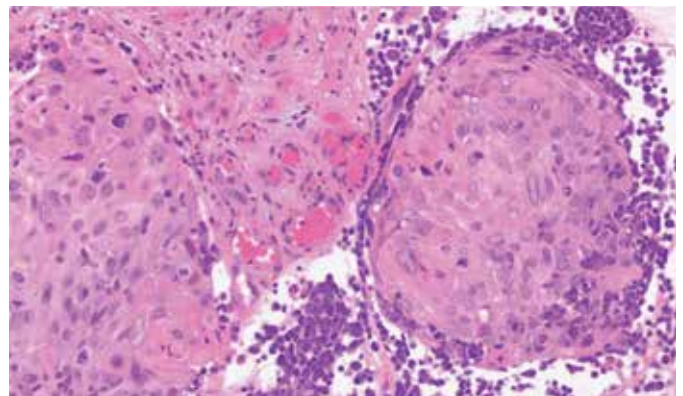


Figure 3: Nodules of squamous cell carcinoma with focal keratinisation (H&E 20x).

meeting. The lesion had been completely excised. Due to the presence of lymphovascular invasion an ultrasound of the inguinal lymph nodes was requested. This subsequently appeared negative. Adjuvant radiotherapy was the recommended form of treatment for this patient.

Discussion

Merkel cell carcinoma (MCC) is a rare, aggressive form of cutaneous neuroendocrine carcinoma. It usually occurs in the elderly, with 81% of cases affecting those aged 70-90 years of age. It is more commonly found in males than females. Most cases are linked to UV sun-exposure of the head and neck, Merkel cell polyomavirus (MCPyV) or various causes of immunodeficiency/immunosuppression. MCC accounts for 0.2% of skin cancers in Ireland[1] with an overall 5-year survival rate of 51%[2].

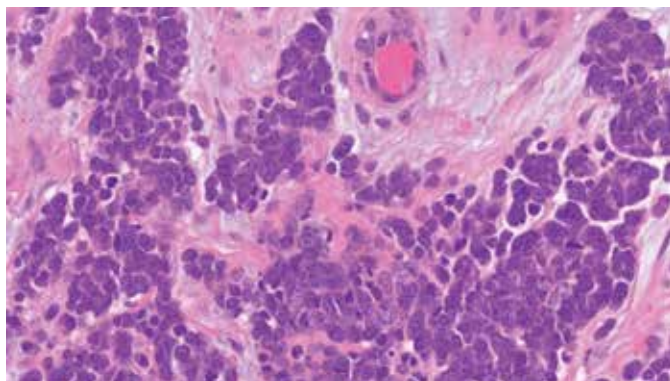


Figure 4: Merkel cell carcinoma composed of blue basaloid cells with 'salt and pepper' chromatin and increased mitotic activity (H&E 40x).

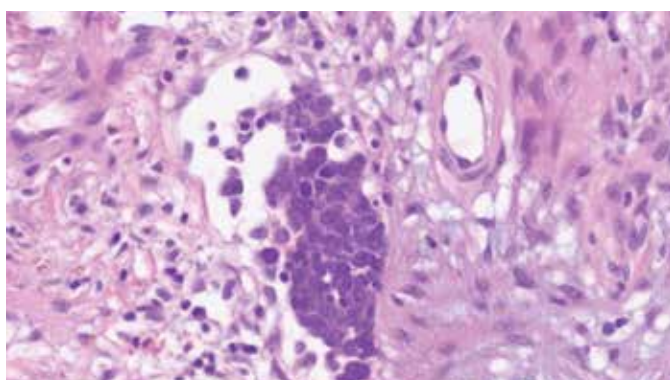


Figure 5: Lymphovascular invasion (H&E 40x)

Squamous cell carcinoma (SCC) is the second most common skin malignancy in Ireland after basal cell carcinoma and mainly occurs in the older population. SCC accounts for 27% of all non-melanoma skin cancers (NMSC) diagnoses[1]. Risk factors include UV sun exposure, chemical carcinogens, or HPV infection in immunocompromised patients.

Mixed tumours of MCC and SCC have been previously documented[2]. These usually consist of atypical squamous cells dispersed within the MCC or may occur as a collision of two tumours. With rare exception MCC with concurrent SCC is MCPyV negative favouring association with UV damage[3]. However, the exact aetiology is unknown.

An 'AEIOU' acronym has been created that can aid in the clinical diagnosis of MCC[4]. The features included are: asymptomatic, expanding rapidly, immune suppression, older than 50 years of age

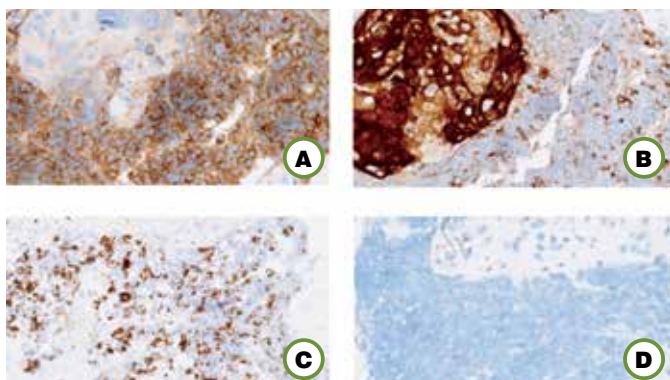


Figure 6: Immunohistochemistry (x40). (A) Synaptophysin: Strong staining in the MCC component and negative in the SCC. (B) EMA: Demonstrating an area of strongly positive SCC with adjacent weaker MCC staining. (C) CAM 5.2: Dot-like positivity. (D) TTF1: Negative staining.

and UV-exposure. In this case the patient presented with 4 of the 5 features: a painless, rapidly growing lesion in an older patient with a history of sun exposure. Histologically, the lesion demonstrated characteristic findings of small round blue cells with a high nuclear:cytoplasmic ratio and "salt and pepper" chromatin.

Differential diagnoses for Merkel cell carcinoma include metastatic small cell carcinoma of the lung, melanoma, lymphoma, and basal cell carcinoma. Metastatic small cell carcinoma and MCC are both composed of small round blue cells and are positive for neuroendocrine markers. Small cell carcinoma will usually stain positive for TTF1. Melanoma can also resemble MCC, however, melanoma will stain positive for Melan-A. This case stained negative for both TTF1 and Melan-A, ruling out metastatic small cell carcinoma and melanoma.

The two tumour components displayed contrasting immunohistochemistry profiles (Table 1). The squamous component was negative for the neuroendocrine markers (synaptophysin, chromogranin and NSE) and strongly positive for cytokeratin stains (CK7 and EMA), indicative of squamous cell carcinoma. The small, blue cell component was positive for neuroendocrine markers and showed characteristic dot-like positivity with CAM5.2 and CK20. This is in keeping with Merkel cell carcinoma. Both components were strongly positive for p63, typically considered a marker of squamous epithelium. Emerging evidence has shown that p63-positive MCC is associated with a significantly worse prognosis than p63-negative MCC[5].

The prognosis for MCC is poor, with a higher mortality rate than melanoma. The prognosis for patients who present with a diagnosis of Merkel cell carcinoma with a concurrent squamous cell carcinoma is mixed due to the rarity of the entity. The current mainstay treatment for both MCC and SCC remains excision of the lesion; with a wide margin of 10-20mm for MCC. Additional adjuvant radiotherapy is effective in patients with lymph node involvement.

Antibody	Merkel cell carcinoma	Squamous cell carcinoma
NSE	Positive	Negative
Synaptophysin	Positive	Negative
Chromogranin	Positive	Negative
P63	Positive	Focal positivity
CK20	Positive	Negative
CAM 5.2	Positive	Negative
EMA	Positive	Positive
Melan A	Negative	Negative
TTF1	Negative	Negative
CD45	Negative	Negative
CK7	Negative	Positive

Table 1: Immunohistochemistry panel results for the Merkel cell carcinoma and squamous cell carcinoma components of the mixed tumour

References

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International Undergraduate Journal of Health Sciences

Volume 1 Issue 2 Article 3, 2021

The Knowledge, Prevalence and Perception of Sexually Transmitted Infections (STIs) among the Third-level Student Population in Cork, Ireland

Stephen McKenna*, Anna Pohrebyannyk*, Cathal O'Regan*, Claudia Mayer*

*Department of Biological Sciences, Munster Technological University, Bishopstown, Cork, Ireland.

Abstract:

Background: Sexually transmitted infections (STIs) are transmitted through sexual contact with an infected person and these infections are capable of causing health problems such as infertility. In Ireland, the majority of STIs have been on the increase since the early 2000s, particularly among young people aged 15-24 years old.

Aims: The aims of this study were to investigate the knowledge, prevalence and perception of third-level students in Cork, Ireland regarding STIs.

Methodology: The survey created using Google Forms™ was distributed to registered students of University College Cork (UCC) and Munster Technological University, Cork (MTU). The questions were constructed based on similar surveys included in peer-reviewed papers. Ethical approval was received prior to commencing this survey. The collected data was statistically analysed via Microsoft Excel.

Results: A total of 709 anonymous, valid and voluntary responses were collected. Eighty-five percent of respondents had received sexual health education at secondary school. Of 709 respondents, 673 (94.9%) believed that unprotected sexual activity could lead to acquiring STIs. Over half (56.1%) of sexually active respondents were unaware of free STI testing available on both university campuses.

Conclusion: The majority of third-level students felt that their sexual health education was limited. The respondents lacked ample knowledge on the topic of STIs and were incapable of correctly answering all of the survey's questions.

This article is available in full in the International Undergraduate Journal of Health Sciences: <https://sword.cit.ie/ijhs/vol1/iss2/3>

International Undergraduate Journal of Health Sciences

Volume 1 Issue 2 Article 2, 2021

An Investigation into the Prevalence of Vancomycin-resistant Enterococci within an Irish Hospital

Dylan Casey

Department of Biological Sciences, Munster Technical University, Bishopstown, Cork, Ireland.

Abstract:

Vancomycin-resistant enterococci (VRE) are well-recognised nosocomial pathogens that pose a significant threat to public health. Associated with poorer clinical outcomes than their vancomycin-sensitive counterparts, the prevalence of VRE in Ireland has increased in recent times, with the European Antimicrobial Resistance Surveillance Network reporting that out of 29 countries, Ireland demonstrated the highest rates of vancomycin resistance among invasive *Enterococcus faecium* isolates between 2011 and 2014 (2011; 34.9%, 2012; 44.0%, 2013; 42.7%, 2014; 45.1%). Herein, we investigate VRE prevalence in the Mercy University Hospital (MUH) – an acute care hospital in southern Ireland. A total of 21 first-time VRE infections were identified over a 40 day period between January and March 2021, representing a prevalence of 24.7%. In addition, one vancomycin-sensitive linezolid-resistant strain was isolated from an Intensive Care patient, and environmental analysis revealed the presence of an extensive VRE reservoir, with isolates identified on a keyboard, bedside desk, and electricity bar of a primary observation unit. We also highlight the actions taken – including staff training and surface decontamination – to curb transmission of the pathogen and prevent a full-scale VRE outbreak developing within the hospital.

A study of Methicillin Resistant *Staphylococcus aureus* Isolates from an Irish Hospital: assessing the geographical spread and clonality of spa types



Nicola Blake

Supervisors: Nicola Blake, Dolores Crowley, Julie Twomey, Dr Helen O'Shea

Abstract:

Introduction: *Staphylococcus aureus* can progress from commensal status to cause life-threatening illness. This is dictated by its arsenal of virulence factors, and potentiated

by acquisition of antibiotic resistance traits. Methicillin-resistant *S. aureus* (MRSA) has therefore been established as a persistent and formidable pathogen within our hospital and community settings. Rapid and precise detection of these organisms allows earlier intervention, which reduces admission length, mortality and healthcare costs. This requires the knowledge of trends emerging in the national and international context which may carry the risk of further antibiotic resistance or virulence factor acquisition. Therefore surveillance of isolates from our hospitals serves as a valuable tool for future planning of testing, treatment and prevention of MRSA. This study seeks to conduct surveillance of 241 MRSA isolates from Cork University Hospital, Ireland (2016) within both national and international contexts. These isolates had been typed using *agr*, *SCCmec* and *spa* typing, as well as restriction modification testing. This allows the lineage and associated methicillin and fusidic acid resistance patterns of these isolates to be investigated in this study. Due to the hypervariability of the *spa* typing region, a large number of *spa* types is expected. This project sought to show the geographical spread of particular *spa* types, and to investigate whether alignment of *spa* type short sequence repeats could allow related strains to be grouped together, easing interpretation.

Materials and Methods: Data manipulation was conducted using R. Zeemaps was used to map *spa* types geographically. Clonality of *spa* types was investigated using alignment of constituent Short Sequence Repeats. This was then cross-referenced with the lineage determined by restriction modification testing, and in the literature.

Results: All isolates were community-acquired, with the ST22-MRSA-IVh clone predominating, at 92%. ST22-MRSA-IVh was associated with *spa* t032, t022 and t2945. Mapping showed *spa* types were previously isolated in Western Europe. Short Simple Repeat alignment showed 38 of 54 *spa* types showed similarity to t032. There was concordance between sequence type and Groupings I, IV, VI, while II, III, V and VII required repeating of restriction modification testing. It was also shown that 95.1% of fusidic acid resistant isolates had the L461K *fusA* mutation, which is vertically transmitted.

Conclusion: The MRSA isolates of CUH were highly clonal, dominated by the endemic clone. Mapping of *spa* types showed localised clustering to common travel areas. SSR alignment of *spa* types, the most diverse parameter, showed the majority were related to EMRSA15-associated t032. The Short Simple Repeat alignment system was largely reliable at correctly assigning *spa* types of the same sequence type.

Nicola Blake graduated in Biomedical Science from Munster Technological University/University College Cork and is currently undertaking her clinical laboratory placement in University Hospital Waterford.

Validation of the Biomic V3 Automated Zone Reader for the Comparison of Direct Susceptibility Testing to a Standardised Method for Antibiotic Susceptibility Testing on Urine Samples



Zara Brady

Supervisors: Niamh Carpenter & Larry O'Neill, Microbiology Department, Cavan General Hospital, Dr Debbie Corcoran, Lecturer, Galway-Mayo Institute of Technology.

Abstract:

Introduction: Direct Susceptibility

Testing (DST) is a method whereby susceptibility testing is performed directly on the patient's sample using disk diffusion. DST is extremely advantageous as the susceptibility profiles are obtained 24-hours earlier than standardised antibiotic susceptibility testing (AST), enabling a rapid turnaround time. This aids in the prompt administration of tailored antibiotic therapy which helps to prevent the emergence of antibiotic resistant strains. This is especially important for critically ill patients.

This study aimed to validate the Biomic V3 automated disk diffusion reader for use on midstream urine (MSU) samples where *Escherichia coli* (*E. coli*) has been identified as the primary pathogen. The rationale for this study was to determine if performing DST on *E. coli* MSU samples agrees with the standardised method for AST in Cavan General Hospital, which is the Becton Dickinson (BD) Phoenix 100 analyser, based on EUCAST guidelines.

Methods: Only MSU samples where greater than 105 organisms/mL of *E. coli* were isolated in pure culture on chromogenic agar were included in the study. Out of the 295 samples that were set up for DST, only 111 samples could be utilised for the study.

Results: When utilised on samples where *E. coli* was identified as the primary pathogen, the overall agreement obtained between standardised AST on the Phoenix analyser and DST using the Biomic V3 was 97.9%. A total of 16 (1.3%) very major errors, 2 (0.2%) major errors, and 8 (0.7%) minor errors were seen. All antibiotics except Amoxicillin-clavulanate achieved an agreement of over 95%. A Cohen's kappa of 0.902 was achieved overall when comparing both methodologies.

Conclusion: DST can be confidently used as a method of AST for MSU samples where *E. coli* has been identified as the primary pathogen. However, Amoxicillin-clavulanate should not be reported on patient samples when using DST. Due to the high number of non-interpretable samples set up for DST, the methodology could be reserved for patients who would benefit most from the decreased turnaround time.

Biography

Zara graduated from Galway-Mayo Institute of Technology (GMIT) in Spring 2021. She is currently working as a medical scientist in the Biochemistry department in Cavan General Hospital, where she completed her clinical laboratory placement. She is currently studying for her MSc. in medical science at GMIT.

The incorporation of point-of-care analyser ROTEM®, to enhance the treatment of major haemorrhage.



Ashley Hendy

Abstract:

The incorporation of point-of-care analysers, like ROTEM®, to enhance the treatment of major haemorrhage is being recognised internationally. ROTEM® analyses whole blood samples to allow rapid analysis of coagulation parameters.

In 2018, ROTEM® was introduced to enhance the treatment of post-partum haemorrhage in the National Maternity Hospital (NMH). However, the implementation of ROTEM® in this setting required evaluation. The British Society of Haematology provide guidelines for the use of ROTEM® in treatment of major haemorrhage. The use of ROTEM® in NMH was evaluated in comparison to these guidelines and a quality improvement initiative was designed to address the downfalls identified.

This study revealed under-utilisation of ROTEM® analysis in NMH. In 2019-2020, 79.6% of patients eligible for ROTEM® analysis were not tested on this platform. When incorporating ROTEM® analysis in NMH, the massive haemorrhage pathway must be activated, as per the locally verified ROTEM® algorithm. This study identified the massive haemorrhage pathway is potentially under-activated in this setting. In 2019-2020, 60.9% of patients analysed on ROTEM® in NMH satisfied the specified blood loss trigger for ROTEM® analysis, yet only 14.7% were treated alongside an active massive haemorrhage pathway. Review of ROTEM® records found no documented training records of staff in ROTEM® analysis and significant issues with identifying IQC failures.

A survey of ROTEM®-users revealed training was not standardised for ROTEM® in NMH. To address these findings, a ROTEM®-User Training Programme was drafted and participation in an accredited external quality assurance scheme was initiated.

Biography

Ashley graduated with First-Class Honours in Biomedical Science from Technological University Dublin, 2021. In final year she majored in Biochemistry, Transfusion and Transplant Immunology. She is currently working in the National Maternity Hospital in the Blood Transfusion Laboratory.

To determine a novel role for G protein-coupled receptors in Pancreatic ductal adenocarcinoma pathogenesis.



Fiachra Nolan

Supervisors: Dr Brian Moran, Karen Finn, Ryan McGowan and Áine Sally

Abstract:

Pancreatic ductal adenocarcinoma (PDAC) accounts for 90% of all pancreatic carcinomas and is the 11th most common cancer in Ireland. PDAC

has a mortality of 10.8 deaths per 100,000 population. The aim of this investigation is to determine a novel role for G protein-coupled receptors in PDAC pathogenesis. Alongside this aim the role of GPCRs may be used to enhance patient treatment through their modulation, increasing cancerous cell death while retaining living non-cancerous cells. This aims to reduce mortality and extend the patient life expectancy.

G protein-coupled receptors (GPCRs) are seven-transmembrane receptors and control downstream signalling which may promote or inhibit ion channels or enzyme production. GPCRs may have varied expression between normal human pancreatic ductal epithelium cell lines (HPDE) and PANC-1 cells which are a cancerous cell line obtained from a 56-year-old Caucasian male PDAC patient. Both cell lines are cultured *in vitro* to allow investigation.

TaqMan qPCR probes were used to determine the relative expression of specific G protein-coupled receptors known as GPCR-X and GPCR-Y in PANC-1 and HPDE cells. These receptors have been renamed due to further research being undertaken. GPCR-X shows 7.2-fold upregulation in PANC-1 cells compared to normal cells ($p < 0.001$), while GPCR-Y has similar expression in normal and PANC-1 cells. Indicating that GPCR-X may play a role in the pathogenesis of PDAC while the involvement of GPCR-Y is unlikely.

MTT and NR cell viability assays using PANC-1 cells cultured *in vitro*, assessed the effect of agonising and antagonising GPCR-X in combination and comparison to gemcitabine. The conventional pancreatic cancer treatment gemcitabine, appears ineffective treating PDAC, producing a maximal 22% cytotoxicity, as expected due to the highly resistant nature of PDAC. Agonising GPCR-X with specific agonists creates enhanced *in vitro* cell growth in comparison to untreated cells. Antagonising GPCR-X with specific antagonists alone creates up to 43% cytotoxicity ($p < 0.0001$). A combination of antagonising GPCR-X and treatment with gemcitabine creates a maximal 69% cytotoxicity ($p < 0.0001$). This indicates that antagonising GPCR-X has greater therapeutic potential than gemcitabine alone and is enhanced in combination with gemcitabine, as supported by statistical p-values in comparison with gemcitabine alone. This creates potential for use of GPCR-X as a novel therapeutic target for PDAC.

Biography

Fiachra graduated from GMIT in 2021 and is currently working as a Medical Scientist in the Galway Clinic.

Does the Level of Expression of Cellular mRNA Encoding gC1qR Change with Alphavirus Infection?



Madeleine Quinn

Supervisor: Dr. Martina Scallan,
Microbiology Department in UCC.

Abstract:

gC1qR is a well-studied pathogen recognition receptor (PRR) which interacts with many viruses. Viruses such as Human Immunodeficiency Virus (HIV), Hepatitis C Virus (HCV), Epstein Barr Virus (EBV), Rubella Virus (RV), and Herpes Simplex Virus (HSV) are known to interact with cellular gC1qR in a manner which favours their own viral replication. Semliki Forest Virus (SFV) capsid protein has been reported to co-immunoprecipitate with gC1qR leading to speculation that SFV may also manipulate gC1qR to favour its own viral replication. In order to evaluate the relationship between gC1qR and SFV, confluent and sub-confluent baby hamster kidney (BHK) cell monolayers were infected with either the L10 or SFV A7(74) strain of SFV, with parallel mock infected controls. Quantitative Real-Time Polymerase Chain Reaction (qRT-PCR) analysis was carried out and the cycle threshold (C#) values obtained were used to calculate the level of expression of the gene of interest using $\Delta\Delta C\#$. In confluent BHK monolayers infection increased the expression of gC1qR while expression decreased upon infection of sub-confluent monolayers. The expression of gC1qR in uninfected BHK cells was highest in cells that were most confluent and lowest in the least confluent monolayers. The affect confluency has on the accumulation of SFV9 RNA was found to differ between virus strains. β -Actin and GAPDH reference genes displayed divergent expression patterns when compared (as reference genes) across different confluences of uninfected cells and between uninfected and virus infected cells.

Biography

Madeleine graduated in Biomedical Science from UCC/MTU and is currently on clinical placement in University Hospital Limerick (UHL-2022).

Molecular and phenotypic investigations to assess risk to human health associated with a collection of *Pseudomonas aeruginosa* of clinical origin.



Fionn Sheridan

Abstract:

Pseudomonas aeruginosa (*P. aeruginosa*) is an opportunistic pathogen that is increasingly implicated in outbreaks of a variety of healthcare-associated infections with high mortality. *P. aeruginosa* demonstrates high antimicrobial resistance, with the ability to form biofilm that further enhances antimicrobial resistance, establishes chronic infection and allows persistence in the healthcare environment. This study aimed to assess the risk of clinically isolated *P. aeruginosa* to human health through phenotypic and genotypic characterisation methods. A total of 52 clinical *P. aeruginosa* isolated from various anatomical sites were investigated for antimicrobial susceptibility, biofilm formation, biofilm metabolism and Congo red morphotype. Whole genome sequencing was then applied to perform in-silico virulence and antimicrobial resistance genotyping, MLST, SNP analysis and pan-genome alignment. High level resistance was seen against all beta-lactams, ciprofloxacin and gentamicin, with high susceptibility to amikacin and colistin. All clinical isolates were biofilm formers, while most were strong biofilm formers and metabolically inactive. Highly resistant and virulent genotypes were identified in our collection. Congo red morphotypes were diverse and could not be correlated to a virulence genotype. MLST showed the presence of international high-risk clones, while SNP analysis and pan-genome alignment showed multiple closely-related isolates. AST and biofilm studies highlight the need for new antimicrobial agents and anti-biofilm therapies to combat these infections. Furthermore, the discovery of multiple international high-risk clones, and associated horizontally transferred AMR genes, highlights the importance of surveillance programmes that monitor their dissemination. Moreover, the application of WGS in identifying potentially persistent strains in the healthcare environment can inform infection control teams to identify and eradicate these strains.

Biography

Fionn graduated with a First Class Honours in Biomedical Science, from the Technological University Dublin. He is currently works as a Medical Scientist in the Microbiology laboratory of St. Vincent's University Hospital.

PAUL O'ROURKE

The haematology laboratory at St James's hospital and the wider medical laboratory community were devastated to hear the news that their colleague, Medical Scientist Paul O'Rourke passed away suddenly on New Year's Day. Paul was much-loved and will be profoundly missed.

Paul was born in Solihull, England where his parents lived at the time and as a small child he returned with them to Ireland. He never forgot his birthplace and his father related that when he was applying for State Registration with CORU, he found the address they had lived at online based only on his father's description of the house! The family first lived in Coolock then settled in Malahide. Paul graduated from Kevin Street College of Technology in the 1980s and later studied at Bristol Polytechnic. He worked in several medical laboratories in the Dublin area including at St Vincent's and James Connolly hospitals, before he joined St James's hospital in the early 1990s, where he went on to give over 30 years of service. Paul worked in all areas of the haematology laboratory and for many years participated in the out-of-hours emergency service with the blood transfusion laboratory. He was involved in the early development of several laboratory services, particularly flow cytometry, which is a vital tool in the diagnosis and monitoring of haematological malignancy. He was a co-author on several published scientific papers along with colleagues in this area. Paul also worked in the national coagulation laboratory and in the cell counting and blood cell morphology laboratories; however he found his niche in the later part of his career in the haematinics and transplant drug monitoring laboratory. This section tests for vitamin and iron deficiencies and monitors levels of immuno-suppressive drugs in patients who have had a stem cell transplant. Paul had an in-depth knowledge of laboratory analysers, assay systems and the companies that produce them that was much valued by his colleagues and by the wider diagnostics industry. As such, he was well known by product specialists from diagnostic equipment companies and they regularly sought his opinion on scientific matters.



In addition to his scientific contribution and achievements, Paul was unique and genuinely loved by all of his colleagues, not only in the laboratory but throughout the hospital and beyond. He had a great love of cars, popular culture such as music and film, and all things technological. Many colleagues commented on his sharp wit and good humour, as well as his great willingness to share his knowledge and help them. He had a talent for accents and mimicry and seemed to have a different song for every day. He often entertained colleagues as they worked with him in the laboratory, so much so that his area was one of the most popular for those who worked there on rotation! A huge number of personal tributes were paid to Paul online and in a book of condolence at St James's hospital. He was described by colleagues and friends as "a charming gentleman and splendid colleague, excellent in his craft" "unique before it was cool to be so" "a wonderful bright person", "one of nature's true gentlemen and an ambassador for the goodness of a full life" and "one of the good guys". Others recalled "fond memories of all the stories, songs and laughs", "Paul

was such fun to be around", "I loved his eccentricity and he was a great listener with a non-judging heart", "very knowledgeable and generous with it", "a very kind person with a big heart" and "I hope he's enjoying his rock music over the rainbow".

Paul was a special kind of hero who worked right to the end and passed away while still in post. He was last at work on Tuesday 28th December which was a public holiday, providing vital monitoring of immuno-suppressive drug levels for post-transplant cancer patients over the holiday period. A medical haematologist commented "Many of our patients won't ever know the valuable tests he did that helped them towards recovery".

He was truly unique and an excellent medical scientist who cannot be replaced. He is part of the history of the haematology department at St James's and will be long remembered by his colleagues both at St James's and throughout the medical laboratory community in Ireland. We send our sincere condolences to Paul's father Sean.

Richard McCafferty, Chief Medical Scientist, Haematology

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