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Executive Committee

Without representation we do not thrive

In some areas of academia and scientific debate, the under-representation of female voices continues to cause concern. In December 2021, The Sunday Times came under fire for an article headlined *Phwoar! Look at the vital statistics on these lads.*

Failing to find just one woman data scientist to feature in an article on how number crunchers have become the 'smoking-hot heroes' of the pandemic, female voices and expertise were, yet again, marginalised in mainstream media reporting. Why is this still happening?

Numerous studies show that, despite the number of women entering into STEM equalling, or surpassing the number of men, they still publish less, are paid less for their research and do not progress as far as men in their careers. I know a number of complex factors come into play when looking at bias in the STEM fields, but certainly role models and representation matter enormously, and mainstream media has a moral duty to show more balanced, inclusive and diverse portrayals of scientists in senior positions. Currently, women only make up around 20% of expert news sources.

This issue of *Microbiologist* celebrates diversity and makes a firm commitment in its 20th year to producing balanced and informative content that reflects the diversity in our global audience and to provide positive role models for all young microbiologists.

On page 12 we uncover untold stories of some of the greatest microbiologists that have ever lived. Skip to page 46 to check out why SfAM member Timothy Keyondo was awarded Africa's biggest prize for engineering by the Royal Academy of Engineering. Caleb announces the date for the eagerly awaited in-person (we hope) ECS Symposium on page 10 and Lucky Cullen reveals insights into the diverse make-up of the committees and staff of SfAM.

We are also treating you to articles on vampires, bladder infections and short-term research contracts and an interview with brand new Editor-in-Chief of *Microbial Biotechnology* – the genius that is Juan Luis Ramos.

Paul Sainsbury
Editor

These units will now give access to improved sanitation for many marginalised communities across Uganda

Timothy Kayondo
Innovation in Africa (Page 46)

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Emerge to a changed world

During the past two years, one quote – a line from the Irish poet Seamus Heaney, captured the public mood '*If we can winter this one out, we can summer anywhere*'. During periods of anxiety and uncertainty, the capacity to look forward with hope to better times, though difficult, brings with it focus and motivation.

As I write this column, the UK and other countries across the world are moving towards easing of the final restrictions imposed during the pandemic. I'm conscious also that many countries, and many millions of people, remain firmly in the grip of this pandemic without sufficient access to vaccines. Overall, however, the progress made and continuing to be made with vaccination delivery, understanding of the nature and spread of the infection, and public health measures is moving the world towards a return to a pre-COVID world. A number of scenarios have been drawn up, for example, the UK government's Viral Evolution Scenarios published last month, which sets out a number of possible scenarios for the course of the SARS-CoV-2 pandemic based on the assumption that the virus will continue to circulate and that new variants will emerge. These scenarios range from a reasonable best-case (no major antigenic evolution, gains in transmissibility or return to Delta-level disease severity and only relatively small resurgence in autumn/winter 2022/23), central optimistic (seasonal waves of infection, comparable in size and severity to Omicron), central pessimistic (new variants of concern, large waves of infections with severe disease and mortality) to reasonable worst-case (high global incidence, incomplete vaccination, emergence of variants, some of which showing immune escape and severity, with large waves of disease). This range of potential outcomes is a reminder, if any were needed, that significant uncertainty remains as to what exactly emergence from the pandemic will look like. What is predictable is that we emerge to a world that has changed and that those changes bring new challenges for us all.

Last summer, the Organisation for Economic Co-operation and Development (OECD), an intergovernmental economic organisation representing 38 member countries, published a policy brief entitled '*How will COVID-19 reshape science, technology and innovation?*' It's a question of wider importance to society, with implications for industry, academia, and the current science, technology and innovation workforce, and to the speed and direction of future innovation. It's a question relevant to all members of SfAM and central to the work that we, as a learned society, do. It's entirely possible that the impacts of COVID-19 on science, technology and innovation may affect our ability to prepare for any future pandemic. The report points to the pandemic's unequal effects and impacts across and within various sectors, which seems set to deepen global disparities having pushed more than

Brendan Gilmore
President of the Society for Applied Microbiology

119 million people into extreme poverty in 2020 alone. Worryingly, the report warns that the effects of COVID-19 on the global economy, including slower growth and increased levels of public debt, will lead to reduced funding for research, and exacerbate issues of brain drain of highly skilled workers from one country to another, as seen in the 2008–2009 global financial crisis. In addition, the impacts of the COVID-19 pandemic might lead to further inequality in participation in science, technology and innovation systems with students from disadvantaged groups and female researchers (especially those with young children and caring responsibilities) potentially excluded permanently from science technology and innovation. SfAM policy work in the past year has highlighted a number of issues of concern for our members, which are also echoed in the OECD report, in particular the effects on young researchers, PhDs and postdocs who already experience instability due to short-term funding, limited contracts and a precarious funding landscape for their transition to permanent positions. I would highlight our recent position statement on short-term research contracts and policy briefing '*SfAM supporting microbiology to prevent the next global catastrophe*' and '*Inquiry into equity in the STEM workforce*' from our excellent policy team for more information on SfAM concerns and actions in these areas. Also of relevance to the portfolio of SfAM's activities, the report highlights the benefits but also potential disadvantages of online and remote working, including working from home and online conferences. Virtual environments have significant benefits, including flexible working, reduced travel and carbon footprint, and larger and more diverse audiences at conferences. However, there may be some disadvantages to newcomers to the field; online conferences make it easier to attract leading scholars to become involved, but it can be difficult for others to make an impression at these events. Hybrid events have real potential but must be designed carefully to ensure participants have the opportunities to network, amplify their science and make connections across the discipline. We are looking forward to meeting in person as soon as possible, but also in ways that will widen participation at our scientific meetings.

Work has intensified in the past months at SfAM on developing, refining and taking concrete action towards bringing to life a new strategy that will transition us from the pandemic to a Society focused on growth and improvement in all areas of our portfolio, from publishing to policy, member support to networking and meetings for the future. These strategy discussions have energised the team and the trustees and we are confident that as we update you, the members of SfAM, you will be confident that we are building our Society together, on our heritage and incredibly strong foundations, for the future. We will seek your views and ensure you remain at the centre of what we do, to meet your needs and those of our discipline of applied microbiology in the best, most effective ways. We are aware of the challenges that our members have faced in the past two years, and of those we will face together in the coming times. I remain more excited than ever for the developments ahead and look forward to interacting with you in the coming months as we move towards a post-pandemic world.

A good result for biology

The W H Pierce Prize is one of the longest-standing awards presented by the Society. Each year we award this prestigious prize to an academic at an early stage in their career who has made a substantial contribution to the science of applied microbiology.

The award was instituted by the directors of Oxoid to commemorate the life and works of the late W H (Bill) Pierce, former Chief Bacteriologist of Oxo Ltd and a long-time member of the Society. Since then, this prize has been, and will remain, a testament to the long and productive relationship the Society has held with industry partners Thermo Fisher Scientific (previously Oxoid).

The W H Pierce Prize is also an exemplar of the strong and long relationships we hold with our members. It dates back to 1984, when the recipient was Matthew D Collins, after whom the genus *Collinsella* was named. This prize has been a real showcase of the diversity of the areas of applied microbiology our members are working on, and many of the winners have remained closely connected to the Society: the Chief Editor of *Letters in Applied Microbiology*, Professor Jean-Yves Maillard, whose research area is antimicrobials, was the recipient in 2003; current trustee, Professor Sally Cutler, whose main research interest is bacterial zoonoses won the award in 1996; and three years earlier, the prize was awarded to food microbiologist, Professor Christine Dodd who went on to become the 4th female President of the Society. More recently, our current President, Professor of Pharmaceutical Microbiology Brendan Gilmore, received the Prize in 2017. You can view details of all previous winners on the **SfAM website**.

New to the 2022 award, **W H Pierce Prize recipients** will, if needed, have automatic access to a **Global Talent** visa. Normally, you can apply for the Global Talent visa to work in the UK if you're a leader or potential leader in academia, research, arts and culture, or digital technology. Applications require an endorsement to prove that you are a leader or potential leader. However, you can apply for the visa without this endorsement if you've won an eligible award and the W H Pierce Prize is now eligible, alongside awards from other strategic partners of the Royal Society of Biology: British Pharmacological Society, British Ecological Society and Biochemical Society.

This is an encouraging enabler of international collaboration: to quote Mark Downs of the Royal Society of Biology: *It's a good result for biology*. This year's call for nominations will be opening soon. The prize comprises £6000, split as a £5000 educational grant and £1000 as a cash prize. Recipients do not have to be existing SfAM members, but nominations must be from members of the Society. Now that recipients can apply more easily for a Global Talent visa I hope that the W H Pierce Prize will reflect the global diversity we see within our membership and that some exciting international nominations pass across our desks this year.

Lucy Harper
Chief Executive of the Society for Applied Microbiology

To nominate a candidate please visit the SfAM website for further details

Lindsay Hall
2019

Brendan Gilmore
2017

Freya Harrison
2021

NOMINATIONS OPEN
1 MARCH 2022

W H Pierce Prize

For microbiologists who have made a substantial contribution to applied microbiology

Joan Geoghegan
2020

Sarah Coulthurst
2018

Jack Gilbert
2016

The closing date for applications is 28 July 2022

(Old) friends reunited

On behalf of the ECS Committee, welcome to 2022! The idea of a new year heralding significant change is a tired cliché, but I have a feeling this will be a big year for the Society for Applied Microbiology.

In 2020, the ECS Symposium had to be cancelled last minute, but we managed to salvage some sessions including a successful Twitter poster storm. We knew what to expect for 2021 and planned a fully digital symposium, hosting one of SfAM's biggest events to date. We pioneered formulas the Society would use throughout the pandemic for events, including the record-breaking International Applied Microbiology Conference and the panel session interviewing the Society's 2021 Fellow, Nobel Prize winner Professor Jennifer Doudna. These events reduced the pandemic's impact on our ability to share ideas, but they could not replicate the networking and social aspect of an in-person event. This year we can all look forward to coming together as a community once more.

We have made the decision to delay our 11th annual ECS Research Symposium. Reviewing the trends in testing shows that the summer significantly reduces transmission. By delaying the symposium we reduce the risk of being limited by the pandemic and make it safer for all delegates to travel and attend. Shifting online again was considered, but like our members we are desperate to come together in person again. We think that in the UK, the timing is right to safely host an in-person event. We are excited to announce the 11th annual ECS Symposium at the Mercure Hotel, Cardiff, on 20 June 2022. It is our hope that by announcing now there is still time for our members to plan accordingly and we look forward to seeing as many of you there as possible.

On a personal note, I can't wait to reunite with old friends and make new ones. Attending a research conference like the ECS Symposium is always a highlight for me. I think it is just the motivation I need to keep pushing in the final months of my PhD as I edge closer to that dreaded thesis-writing stage!

In other ECS news, our committee's industrial representative Nicky Williams has landed a great new job outside the word of microbiology and decided the time is right to move aside for a new recruit. The committee thanks Nicky for their enthusiasm and talent, and their contribution to the Society through their artwork, which highlights the beauty of the microbiological world, will forever be remembered on the covers of the *Microbiologist* magazine in 2020 and 2021.

Caleb Marsh
ECS Committee Lead Communications Officer

11TH ECS RESEARCH SYMPOSIUM 2022

Mercure Hotel Cardiff
20 June 2022 / 09:00–16:30

Abstract submission closes
19 APRIL 2022
– submit to present your talk or poster

The Society for Applied Microbiology is excited to announce the return of its Early Career Scientist Research Symposium, an in-person event in June 2022.

The symposium offers a supportive environment for delegates to develop their presentation skills and receive supportive feedback from like-minded people. Drawing on over a decade of successful symposiums, this event is a great opportunity to engage with the microbiology community and expand your network.

Free to members

Non-members £55 early bird before
9 MAY 2022

Non-members (after 9 May 2022) £85

sfam society for applied microbiology
Early Career Scientists

To register visit
www.sfam.org.uk/ecs-symposium-2022.com
or scan our QR code

Uncovering the untold stories of women in science

The phenomenon 'The Matilda Effect', coined by Margaret Rossiter, acknowledges the disparities between males and females in their representation in science history. Across the scientific field, women have been under-represented and overshadowed by male colleagues in the stories of scientific discoveries.

These dialogues are embedded into textbooks, internet searches and podcasts where women are not given credit for the knowledge they have brought to the table in their field of expertise. This is not a new phenomenon; women have been subjected to this for millennia, lost in history books, invisible next to their male colleagues. This article celebrates just a few of the influential female scientists of the past, who exhibited incredible perseverance, drive and determination to overcome the barriers of being a woman in science.

Hannah Trivett
University of Liverpool, UK

Alice Augusta Ball 1892–1916

Alice Augusta Ball

As the first female and African American to receive a Master's from the University of Hawaii, Alice Ball revolutionised the treatment of leprosy, developing a method to purify chaulmoogra oil, known as 'the Ball method'. The injectable form of the oil was a successful leprosy treatment, superseding its impurified oral form, and was the most effective method of treatment for Hansen's disease until the 1940s when a cure was found. However, Ball was nearly written out of history when the president of the university, Arthur Dean, took her early work as his own, naming it the Dean method after she died. It was not until her colleague, Hollmann, published their research crediting her for the work, that she got the recognition she deserved for creating an effective therapeutic.

Elizabeth Garrett Anderson

Inspired by Elizabeth Blackwell, Elizabeth Garrett Anderson fought for her place in a male-dominated profession as the first woman in Britain to qualify as a physician. Initially refused entry to medical school, Anderson registered as a nursing student at Middlesex Hospital, where she attended medical and chemistry lectures and sat in on dissections with her male colleagues. Through a loophole, Anderson was able to sit her examinations through the Society of Apothecaries in 1862, after which the Society banned females from entering the exam. Determined to complete her education and become a qualified doctor, Anderson taught herself French and completed her medical degree in Paris in 1870. It was not until 1873 that Anderson was accepted to be entered in the British Medical Register. Anderson recognised that women's and children's health was overlooked and took it upon herself to open a medical practice, exclusively for women's and children's health. Her persistence in her education and bravery to fight to be accepted into the medical profession enabled other women to follow in her footsteps to become physicians in the UK and, in her remembrance, has a wing of University College Hospital named after her.

Dame Anne McLaren 1927–2007

Elizabeth Garrett Anderson 1836–1917

Dame Anne McLaren

A pioneer in mammalian genetics and embryology, Dame Anne McLaren received her PhD in Zoology from the University of Oxford. Her early research focused on the embryonic development of mice, completing the first successful *in vitro* culture and uterine implantation of an embryo that was carried to full term. This research was published in *Nature* in 1958 where a fellow scientist, Henry Lesse, coined her article as 'one of the most significant papers in the history of reproductive biology and medicine'. Whilst winning various awards for her research, McLaren also held positions in office, including the founding director for the Medical Research Council and the first woman to hold office in the Royal Society. Her influence extended beyond the lab as a member of the Warnock committee, tasked with providing recommendations to the government concerning the regulation of human fertilisation and embryology after the successful birth of Louise Brown in 1978. McLaren was described as an 'indispensable member' by Mary Warnock, for the committee, with members fascinated by her knowledge and ability to communicate complex science into public policy.

Dorothy Crowfoot Hodgkin 1910–1994

Dorothy Crowfoot Hodgkin

Receiving a PhD in Chemistry from the University of Oxford, Dorothy Hodgkin was passionate about uncovering the crystal structures of organic compounds using X-ray crystallography. She made important contributions to the discovery of the 3D structure of biological molecules, which were fundamental to understanding how the molecules worked. In the late 1940s, Hodgkin uncovered the crystal structure of penicillin, observing a β-lactam ring, which was published in 1949, and later determined the crystal structure and composition of vitamin B_{12}. In 1964 she received a Nobel Prize for her work on vitamin B_{12} and penicillin. Thirty-five years after the start of her career, Hodgkin discovered the structure of insulin, which was the first molecule she worked on. Her work on insulin was vital for the development of large-scale production of insulin for diabetes patients. The mapping of many of these biological molecules has led to the saving of many lives, by enabling the development of therapeutics for a variety of communicable and non-communicable diseases, and these crystal structure images are still referred to today.

Esther Lederberg

Esther Lederberg was a pioneer of bacterial genetics, discovering the lambda phage in 1951, and the fertility F factor, which initiates gene transfer by conjugation. In addition to these discoveries, Lederberg and her husband, Joshua Lederberg, developed the Replica Plating protocol commonly used across microbiology labs today. Initially, the process used a powder puff from a compact to transfer bacterial colonies across plates; this was then swapped to velvet, which could be sterilised and had a vertical fabric pile. Today, Esther Lederberg is regarded as one of the greatest female microbiologists, but during her time as an active researcher she was overshadowed and taken for granted by her husband, who received recognition for their joint discoveries. In 1958, Joshua Lederberg and his male colleagues received a Nobel Prize for the work that Esther Lederberg equally contributed to. Whilst she may not have received recognition for her groundbreaking work in the 1950s, Lederberg was a trailblazer in molecular biology and her legacy lives on, as much of her work is still vital in research today.

Esther Lederberg 1922–2006

June Almeida 1930–2007

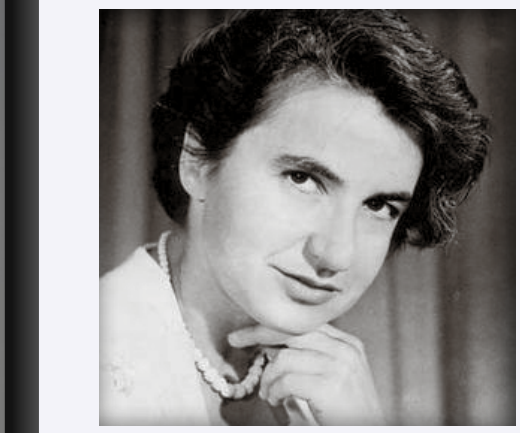
June Almeida

June Almeida was a Scottish virologist and innovator in viral imaging, using electron microscopy for clinical diagnostics. Almeida's work in microscopy saw her develop innovative protocols, which improved the visualisation of viruses, one of which was called immune electron microscopy (IEM). This technique used antibodies to improve the visualisation of cells, tissues and other biological molecules. In addition, she was the first person to visualise coronaviruses using electron microscopy in 1966. Her visualisation of coronaviruses did not go without challenge; when Almeida was tasked with imaging the flu-like virus B814 her images were deemed poor-quality images of influenza due to the similarities between the two viral groups. Its first description was published in 1965 in the *British Medical Journal*, and in 1968 Almeida and fellow scientists working on the discovery published the findings in *Nature*, naming the virus family coronavirus. The list of viruses imaged by Almeida is extensive, and her microscopy protocols are used today, earning her an international reputation in the field of electron microscopy.

The list of viruses imaged by Almeida is extensive, and her microscopy protocols are used today

Jane Hinton

Most widely known for her work on the development of the still commonly used Mueller–Hinton agar, Jane Hinton was an African-American veterinarian. As a child, Jane Hinton was sent to study in several different European countries, as her parents believed she would not get the highest level of education available to her in the USA, due to her race. Jane Hinton later returned to America to complete her high school education and obtained a Bachelor's degree from Simmons College (Boston, Massachusetts) in 1939. She worked as a medical technician in Arizona for the US War Department between 1942 and 1945, before going on to study for and obtain her Doctorate of Veterinary Medicine (VMD) from the University of Pennsylvania in 1949. Along with Alfreda Johnson Webb, Jane Hinton was the first African-American women veterinarian. The two women were also the first African-American members to be included in the Women's Veterinary Medicine Association in the USA. Mueller–Hinton agar is still used today as the gold standard antibiotic-susceptibility testing medium.



Rosalind Elsie Franklin 1920–1958

Jane Hinton 1919–2003

Rosalind Elsie Franklin

In 1952, Franklin, along with her research student, published an X-ray diffraction image that was instrumental in the subsequent determination of the DNA double helix. Despite Franklin directing the work that led to the picture, Franklin's colleague showed the picture to James Watson, who along with Francis Crick published work on the same topic in 1953 and went on to be awarded the Nobel Prize in Physiology or Medicine in 1962. Prior to this, Rosalind Franklin also had an active and prolific research career. In the 1940s, Franklin participated in seminal work to determine the density, structure and composition of coal. Information on the composition and porosity of coal was instrumental in the design of gas masks used in World War II. She also carried out work to determine the structure of RNA in the tobacco mosaic virus, a plant pathogen that wasn't formally discovered until 30 years later. Further work on viruses led her to work on polio, a virus that is now considered to be eradicated in the Western world. In 1956, she was diagnosed with ovarian cancer and died two years later at the age of 37.

Menten is most widely known for the co-creation of the Michaelis–Menten equation

Maud Leonora Menten

Born in 1879, Maud Menten is most widely known for the co-creation of the Michaelis–Menten equation that describes the mechanism and velocity of reversible reactions between enzymes and their substrates. Menten is credited for the equation along with the German biochemist Leonor Michaelis. Menten was born in Canada and later became one of the first Canadian female medical doctors after gaining Bachelor's and Master's degrees from the University of Toronto. After her work on enzyme kinetics, Maud went on to study cancer biology at Western Reserve University and obtained a PhD from the University of Chicago. Her research career led to her becoming a professor and to work as a pathologist at the University of Pittsburgh, during which time she published over 70 research papers. In 1998, Menten was posthumously selected for induction into the Canadian Medical Hall of Fame.

Maud Leonora Menten 1879–1960

Barbara McClintock 1902–1992

Barbara McClintock

Although her mother objected to a college education for her daughter, Barbara McClintock received her BSc, MSc and PhD from Cornell University. It was there her interest in plant genetics was sparked and her groundbreaking discoveries would be made. Working in plant cytogenetics, McClintock observed gene transposition, whereby genes can 'jump' to change the position of the chromosomes. She observed unusual phenotypes, which did not follow the usual genetic inheritance pattern expected, and published these findings in 1950. Many of the discoveries took decades to be recognised and accepted by fellow researchers as they challenged theories of molecular biology and because of this, much of her work went unpublished until later in her career. Her self-belief and confidence in her findings meant that McClintock never gave up and sat on her discoveries until the time was right for them to be published. In 1983, McClintock received an unshared Nobel Prize in Physiology and Medicine, over 30 years after her first discovery of transposons in maize, and until 2021 was the only female to receive an unshared Nobel Prize in this category.

Much of her work went unpublished until later in her career

Flossie Wong-Staal

After receiving her PhD in molecular biology from the University of California, Los Angeles (UCLA) in 1972, Flossie Wong-Staal was a pioneering molecular biologist who worked on retroviruses. Her passion for virology led her to be the first scientist to clone HIV in 1985. In addition to her work on HIV, Wong-Staal was also a key contributor in the Gallo Lab, in proving that human T-cell leukaemia virus type 1 was carcinogenic, which at the time was disputed by other scientists, who refuted the existence of human tumour viruses. Following developments in HIV research, University of California, San Diego (UC San Diego), launched the Centre for AIDS Research; it was there that Wong-Staal's focus shifted to developing drug therapies, leading to the development of the drug cocktails first used to manage HIV infection. Her dedication and fascination with retroviruses helped to unlock the genetic code of HIV and laid the foundations of its workings for therapeutics, which form the basis of treatments we use today.

Gertrude Belle Elion 1918–1999

Flossie Wong-Staal 1946–2020

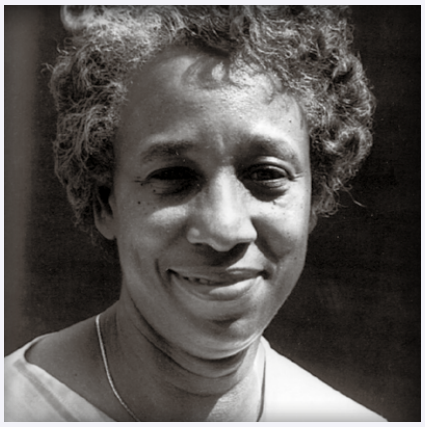
Gertrude Belle Elion

Gertrude Elion was awarded the Nobel Prize for Physiology or Medicine in 1988, for her long-standing work in discovering and developing drugs used to treat numerous health conditions including autoimmune disorders, urinary tract infections, malaria, viral herpes, gout and leukaemia. Examples of drugs developed by Elion include the first drug used to treat HIV/AIDS, azidothymidine (AZT), the antiviral acyclovir and immunosuppressant azathioprine. Whilst finding it difficult to obtain graduate research positions due to her gender, Gertrude worked several jobs in order to save enough money to undertake and complete an MSc at New York University in 1941. Later, forced to make a decision between working to fund herself and committing to her PhD studies full-time, Elion made the decision not to continue pursuing her doctorate. She was later awarded an honorary PhD from the Polytechnic University of New York in 1989. In 1991 she was awarded a National Medal of Science and was inducted into the National Women's Hall of Fame.

Emmy Klieneberger-Nobel

Emmy Klieneberger-Nobel was a German microbiologist who is considered one of the early pioneers of *Mycoplasma* research. In 1930, she became the first female lecturer at the University of Frankfurt; however, she was removed from her position due to her Jewish descent. Klieneberger-Nobel moved to London to work at the Lister Institute, where she carried out the majority of her life's work. Among her contributions to the field of microbiology are the differentiation of *Mycoplasma* bacteria from other genera, the design of nutrient media for the culture of *Mycoplasma* and the first ever isolation of several strains. In 1935, she was awarded the Jenner Memorial Scholarship from the Lister Institute. She is honoured by the International Organization for Mycoplasmology, of which she was the first honorary life member, by the creation of the Emmy Klieneberger-Nobel Award given every other year to an outstanding *Mycoplasma* researcher. She is also an honorary member of the Robert Koch Institute and in 1980, the Robert Koch Medal was bestowed on her by the President of the then Federal Republic of Germany.

Emmy Klieneberger-Nobel 1892–1985



Jessie Isabelle Price 1930–2015

Jessie Isabelle Price

Jessie Isabelle Price was a veterinary microbiologist who is noted for her isolation and vaccine development of *Pasteurella anatipestifer*, one of the most common causes of death in duck farming during the 1950s. Price later joined the Cornell Duck Research Laboratory at Long Island University where she became a professor and carried out work on avian cholera and avian tuberculosis. Price is also credited with developing a vaccine for avian cholera caused by *Pasteurella multocida*. An active researcher as well as member on numerous committees, Price also served as President for the Graduate Women in Science organisation started at Cornell University. She was a member of the American Association for the Advancement of Science, the Association for Women in Science and chair of the Committee of the Status of Microbiologists from 1978 to 1979. Price was also the Chair of the Predoctoral Minority Fellowship Ad Hoc Review Committee for the American Society for Microbiology (ASM), as well as the chair of the Summer Research Fellowship and Travel Awards Program.

UKRI confirms development of their first EDI strategy

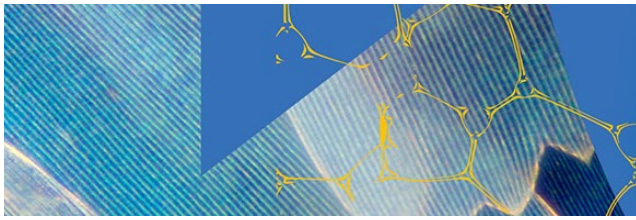
UK Research and Innovation

Following the publication of the **Research and Development (R&D) People and Culture Strategy**, UKRI confirmed that they would develop and publish their first Equality, Diversity and Inclusion (EDI) strategy. UKRI are now consulting widely on the draft strategy and want everybody's voices to be heard.

Read the draft version of the UKRI EDI strategy.

The consultation runs from 13 January with a closing date of midday on 28 March 2022. UKRI welcomes responses from anyone interested or involved in research and innovation, either as an individual, organisation or group.

If you would like to get involved in SfAM's response and tell us about your thoughts on the draft strategy, please contact us at **policy@sfam.org.uk**.



For more information, visit:

https://www.ukri.org/our-work/supporting-healthy-research-and-innovation-culture/equality-diversity-and-inclusion/edi-strategy/

NEW MEMBERS OF THE SOCIETY MARCH 2022

Australia
V Wansink

Canada
A Poulain

China
B Bello

Ghana
C Adinortey
N Adade

India
S Vasanth

Italy
G Gambino
L Iacumin
M Marian

Malaysia
H Elenshasy

Nepal
G Giri

Nigeria
O Adewara
H Audu Jimoh
O Makinde
E Olaleye
O Akinola
O Diamreyan
M Akinyemi
A Okiti

Pakistan
M Siddiqui

Philippines
M Francisco

Saudi Arabia
H Sonbol

South Africa
S Kuttan Pillai

Thailand
B Suraraksa

United Kingdom
O Leelastwattanagul
K Anochshenko
R Nova
K Djoko
B Gregson
E Archer
A Taylor
M Chau
A Timms
M Kiley
E Cunningham-Oakes
A Lilley
B Perez-Sepulveda
L Perry
S Zhang
A Morton
C Redman-White
T Somorin
A Monteagudo
R Nazeer
S Scott
K R O'Reilly
S Boyce
I Zhang
H Massey
F Harrison
J Macleod
F Newberry
A Collins
E Townsend
O Abdulkadir
D Gayrard
A Storan
S Karanastasis
C Dixon
I Jayasinghe
J Horne
G Bulmer
R Maani
K Hwengwere

USA
T Crippen
M Appell

The hunt for the soda-lake vampire

Michail M. Yakimov
Institute of Polar Sciences, ISP-CNR, Messina, Italy

In June 2019, microbiologists from around the world travelled to Transylvania, home of the story of Dracula, not on the hunt for vampires, but for the meeting Halophiles 2019, focused on salt-tolerant microbes. Nevertheless, the allure of the stories of vampirism drew two of the speakers at this meeting – myself and John E Hallsworth – who then went on to join a collaboration with Vladimir M Gorlenko and others to research a real-life vampire of the bacterial kind.

The lifestyle of these bacteria is simple: they find a larger host cell to prey on, attach to it, permeabilise its membrane and then absorb the cell contents until it is completely empty. Vampirism occurs in various biological taxa, most famously leeches, mosquitoes and vampire bats, but also in some birds, sea snails and amoebae. Putative vampire protists have even been identified in the fossil record. Furthermore, such is the anthropogenic allure of 'Draculaism' that some organisms that do not obtain their nutrition via vampirism are nevertheless given the name based on their appearance alone, including the Malaysian vampire snail *Platymma tweediei* and the vampire squid.

A study by Yakimov *et al*., published in 2021, focused on the microbial community of an extreme environment – Lake Hotontyn Nur, a hypersaline alkaline (soda) lake in Mongolia. The authors isolated the photosynthetic bacterium *Halorhodospira halophila*, a microbe known to be anoxygenic (photosynthesis occurs without the evolution of oxygen) and extremely halophilic, but which they found to have small epibionts attached. These epibionts predate *H. halophila* by consuming the cytoplasm, so Yakimov *et al*. named it '*Candidatus* Absconditicoccus praedator'. The authors then cultivated this microbial association to better understand how the epibiont uses vampirism to gain its nutrition. Using various microscopic techniques, Yakimov *et al*. examined cells of the soda-lake vampire in association with the host.

However, the cute appearance of the small, beautifully formed cells of '*Ca*. Absconditicoccus praedator' belies their less-than-virtuous lifestyle.

'Vampire' bacteria occur in various taxonomic groups including the genera *Vampirovibrio* (Terrabacteria group), *Bdellovibrio* and *Micavibrio* (both members of the phylum Proteobacteria) and *Vampirococcus* (member of the superphylum Candidate Phyla Radiation). The latter include recently cultivated representatives of candidate phylum Saccharibacteria. *Vampirococcus*, discovered almost 40 years ago, occurs in Spanish lakes during the blooming of photosynthetic purple bacteria, which turn the water a bloody colour. It was reported that large photosynthetic bacteria were killed by tiny cells that attached to their surface and 'sucked out' their contents.

'*Ca*. Absconditicoccus praedator' is the first stably cultivated vampire species and is from the candidate class-level lineage Gracilibacteria (order-level lineage Absconditabacterales) in the Candidate Phyla Radiation. As is typical for all members of the Candidate Phyla Radiation, its reduced genome confers only limited biosynthetic metabolic capabilities, indicating not only a parasitic lifestyle but also a complete dependence on the host cell. In addition to apparent evolutionary adaptations, the genome-inferred physiology and putative metabolism of '*Ca*. Absconditicoccus praedator' suggest that these ruthless yet diminutive bacteria control the size of otherwise dominant microbes within the ecosystems of soda lakes.

Whilst the vampire ground finch (*Geospiza septentrionalis*) is thought to have evolved vampirism due to a shortage of other foods in its island habitat, the habitat of '*Ca*. Absconditicoccus praedator' may not be nutrient deplete, but rather induces cellular stress so that life there is energetically expensive. Given the near-complete abandonment of central carbon metabolism, which would generate energy/reducing equivalents and produce central carbon currencies, together with the absence of any of the electron transport chains that could generate proton motive forces, the presence of fully functional membrane

ATP synthase is very intriguing. This most likely indicates that protons are directly stolen from tightly attached *Halorhodospira* cells. Gaining energy in this way—via the production of ATP by proxy—can be advantageous in a stressful environment.

Vampirism takes many forms, from haematophagy in leeches, vampire bats and other animals that gain nutrition by 'sucking blood', to the less literal but still parasitic consumption of cytoplasm by predatory microbes that feed off their microbial hosts, to the beautiful yet non-parasitic vampire lookalikes such as the vampire snail and vampire crab. The soda-lake vampire found in Lake Hotontyn Nur may not be swooping in to bite your neck at night, but its parasitism on the cytoplasm of the much larger bacteria it shares its environment with has earnt it the rank of vampire nonetheless.

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Above:
Transmission electron micrograph of Ca. Absconditicoccus praedator colonising host cells.

The (not so) wonderful world of catheter-associated urinary tract infections

Vicky Bennett
University of Bath, UK

There's something strangely soothing about watching urine flow through a biofilm-encrusted catheter. The soft 'plip' as the urine drips into the glass bladder, the low-level whir of the urine pump and the gurgle of the water bath. Maybe if my PhD doesn't work out I could pitch it as an alternative to whale music.

Visitors to our lab space at the University of Bath will often be greeted by the sight and smell of this catheterised bladder model system. A catheter is a flexible tube inserted through the urethra into the bottom of the bladder, then connected to a urine collection bag outside the body. They are essential medical devices used widely in hospitals, with as many as 25% of patients having a catheter inserted at some point during admission. Many community-based patients also rely on long-term catheterisation due to various chronic medical conditions that make natural bladder-emptying difficult or impossible.

The presence of a catheter increases the likelihood that a urinary tract infection will develop, and catheter-associated urinary tract infections (CAUTIs) are the focus of our research group. A CAUTI occurs when the catheter becomes contaminated with bacteria from the gastrointestinal tract, allowing them direct access to the bladder and a constant supply of nutrients in the urine. Biofilm formation on the catheter surface improves survival and proliferation of the bacterial community due to avoidance of host defence mechanisms, and reduced susceptibility to antimicrobials. In addition, the risk of kidney infection is increased, as is the risk of developing life-threatening bloodstream infections and sepsis.

We are using several different angles to look at CAUTIs. Much of our research looks at *Proteus mirabilis*, the cause of 45% of CAUTIs and the most common cause of catheter blockage. If an infection caused by a slimy, gunked-up

Pseudohyphae and budding yeast cells in patient urine (urinary tract infection).

catheter tube wasn't bad enough, the potent urease activity of *P. mirabilis* enables it to form a crystalline biofilm that can block the catheter completely. Urease raises urinary pH through the breakdown of urea to ammonia, resulting in the precipitation of substances within the urine. These are incorporated into the biofilm to form a mineralised matrix, and the resulting encrustation of the catheter can eventually block urine drainage. This leads to urinary retention and reflux of contaminated urine to the upper urinary tract, further increasing the risk of severe complications in an already vulnerable patient population.

This crystalline biofilm formation means that *P. mirabilis* is an ideal species for use in the CAUTI bladder model system, as we can measure time to catheter blockage to compare treatments and interventions. Research supported by the Dunhill Medical Trust is investigating how catheter coatings could be used to reduce biofilm formation and blockage. The coating includes a coloured dye that is released when urinary pH rises, and would indicate to patients and healthcare staff that the catheter is likely to block. Ongoing work is looking at how antibiotics could also be included in these coatings.

They won't appreciate the many expletives I use to describe my bladder model experience

We're also looking to understand more about the characteristics of *P. mirabilis* that make it so good at forming biofilms on the catheter surface, particularly focusing on the role of efflux in biofilm formation. Efflux pumps are present in the cell membrane and export toxins and waste products from the bacteria. They are well known for their role in antimicrobial resistance, as by exporting antibiotics to the outside of the cell, the concentration inside the cell will decrease, along with treatment efficacy. This efflux process is also thought to be involved in biofilm formation, as the bacterial community is encompassed by a protective matrix of substances, which must be excreted from the cells within the biofilm. As these efflux pumps are present within different biofilm-forming pathogens, this work may also provide insight into a broader range of infections. The development of drug treatments that inhibit these efflux pumps could therefore be useful, both in reducing biofilm formation and in reducing resistance to antibiotics currently used to treat CAUTIs.

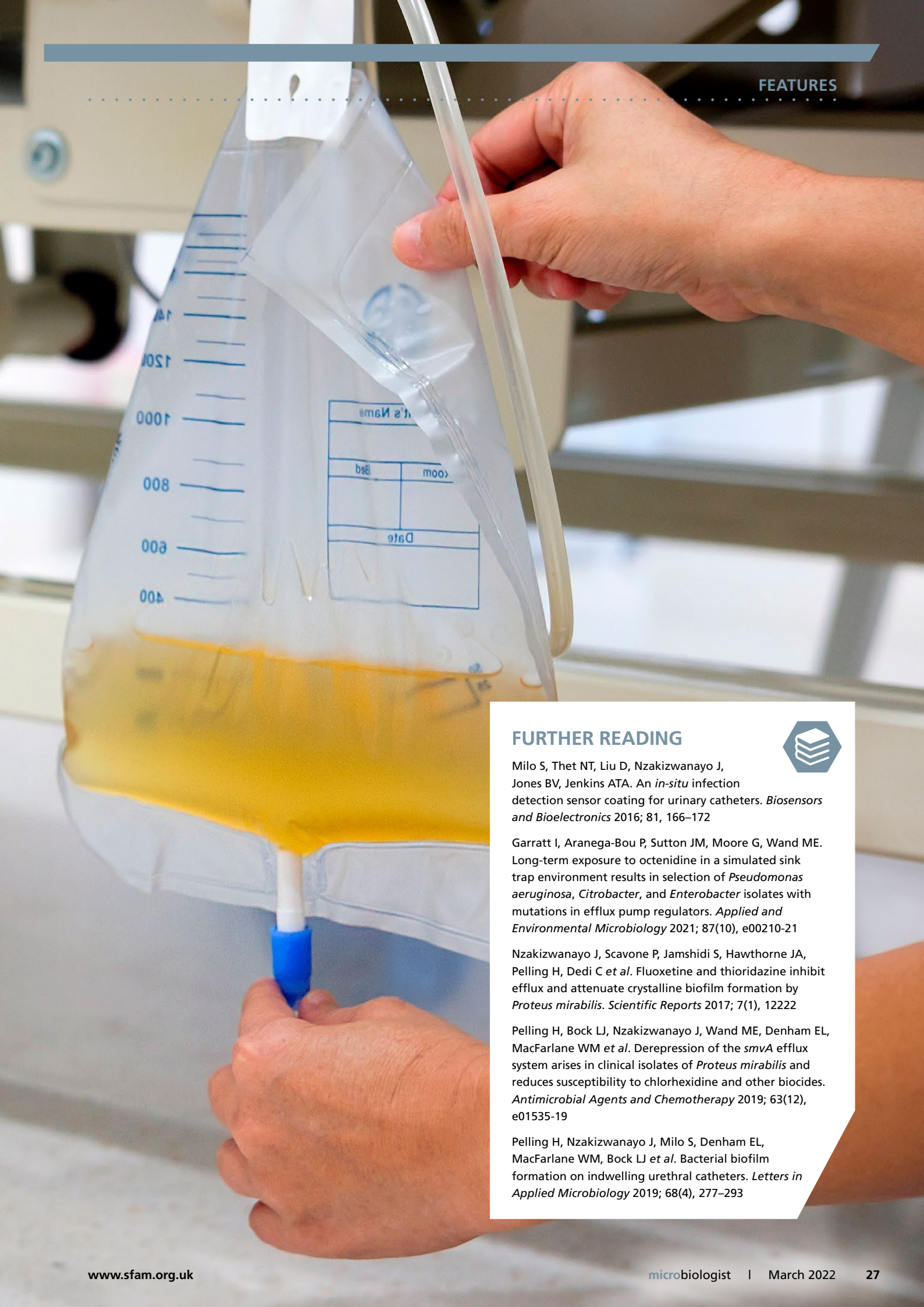
One of the current clinical strategies for reducing CAUTI incidence is the use of biocides such as chlorhexidine to flush through the catheter. This aims to kill bacteria present on the surface and reduce biofilm growth. But many *P. mirabilis* isolates show high tolerance to biocides, with catheter blockage able to occur despite chlorhexidine treatment. Another aspect of our research is investigating the mechanisms behind this tolerance, using clinical strains isolated from CAUTI patients. Changes to both lipopolysaccharide structure and efflux expression have so far been implicated, with ongoing work looking at how these lab findings translate to resistance against actual clinical products.

In a departure from the predominantly *P. mirabilis* focus of our group, we also have some work looking at biocide tolerance in a mixed-species community. This focuses on *Klebsiella pneumoniae*, a World Health Organization priority pathogen and common cause of CAUTIs. This is a new approach to investigate tolerance in the context of a polymicrobial infection, as this is also a clinically relevant scenario.

Another student in the lab said to me whilst we were discussing this article, *I'm not sure I can give you a direct quote as they won't appreciate the many expletives I use to describe my bladder model experience*. And it is very much the case that coming to the lab at 04:00 to empty artificial urine out of a catheter drainage bag can make you question your life choices. But when so much of our work involves looking at obscure protein systems and metabolic pathways that most people have never heard of, I personally appreciate the reminder of its relevance to the bigger picture, and how our work really does have the potential to improve CAUTI treatments and lives in the future.

Funding acknowledgements

This work is supported directly by the University of Bath, as well as by grant funding from the Medical Research Council (MRC)/UKRI, including as part of the GW4 BIOMED MRC DTP. Work on catheter coatings is supported by the Dunhill Medical Trust.



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Short-term research contracts and the effects of COVID-19: an SfAM member's perspective

Clare Taylor
Edinburgh Napier University, UK

Estimates suggest that there are around 80,000 postdoctoral researchers in the UK and these researchers make up a significant proportion of our research community. Most researchers are driven by intellectual curiosity rather than the desire for financial reward, but for postdoctoral researchers, who can spend years on a succession of short-term contracts, this can make a career in science an unattractive option. According to the latest figures, around 54% of all science and technology researchers working in UK universities are employed on fixed-term contracts as contract research staff. In 2001, the House of Commons Science and Technology Select Committee conducted an inquiry into short-term research contracts. The report highlighted several concerns for researchers on short-term contracts, including career insecurity, increasingly uncompetitive salaries and lack of a clear career structure, and called for improvements to employment terms for science researchers. Since then, institutions and organisations have put measures in place to support the careers of researchers but, unfortunately, the COVID-19 pandemic has worsened the situation for many postdoctoral researchers.

A recent *Nature* survey asked postdoctoral researchers how the pandemic is affecting their current and future career plans. The poll ran in June and July 2020, with more than 7,600 people responding across 19 disciplines. Six out of 10 respondents thought the pandemic has worsened their career prospects, with 51% of respondents considering leaving active research because of work-related mental-health concerns. To assess the impact of COVID-19 on the SfAM membership, we included a question in our end-of-year membership survey on whether members had considered changing research area, sector (academic, industry etc.) and/or career because of the impact of COVID-19. A staggering 18.6% stated they have considered changing research career due to the impact of COVID-19.

It would be horribly ironic to lose a generation of microbiologists because of an infectious disease.

Exposing and widening cracks

The COVID-19 pandemic has amplified the pre-existing challenges and inequalities for researchers on short-term contracts. The unprecedented financial uncertainty due to COVID-19 has resulted in university-wide recruitment freezes and incited job losses for staff on fixed-term contracts. Concerningly, the university-wide recruitment freeze could worsen the uncertainty faced by postdoctoral researchers on short-term contracts, as research positions and promotion opportunities may be delayed or limited. The effects of COVID-19 also included a drop in productivity during the end of pre-pandemic contracts due to issues surrounding career stability and individuals having to spend time job-hunting and preparing for interviews.

Lab accessibility

The majority of postdoctoral researchers in microbiology perform 'wet lab' research that has been hit hard by COVID-19 with regard to both lab access and competition for resources. Numerous concerns have been raised over the long-term implications of restricted laboratory access. Some researchers are still unable to access the laboratory to complete essential data collection and other project milestones, impacting publication records, funding retention and ultimately career progression.

For postdoctoral researchers with children or caring responsibilities this has presented an even greater challenge, widening the gaps and exacerbating the inequalities in research careers.

Funding discrepancies

The impact of COVID-19 on research funding has been very diverse, with discrepancies across the different funding bodies. These disparities have considerably influenced the ability of funders to support current researchers through postdoctoral extensions and to continue funding throughout the pandemic. Additionally, there are growing fears over the coverage of funding across different research institutions. Financial support is urgently required across all (not just Russell Group) universities, in order to ensure they can remain active in the future.

The issues outlined above were further compounded by a lack of guidance and clarity in the communication between funders and researchers. Many researchers in the UK revealed that despite the urgent need for postdoctoral extensions, they were informed that if furlough was not taken they could not go back to UKRI and request an extension. Despite this, some researchers were only notified that they were going to be furloughed in June 2020, which had major effects for individual researchers.

At present, COVID-19 research has been prioritised over other areas of microbiology; however, there are fears that COVID-19 research will continue to attract a disproportionate share of funding for many years to come. Sadly, this infectious disease has increased the precarity for many microbiology postdocs at a time when we can ill-afford to lose them.

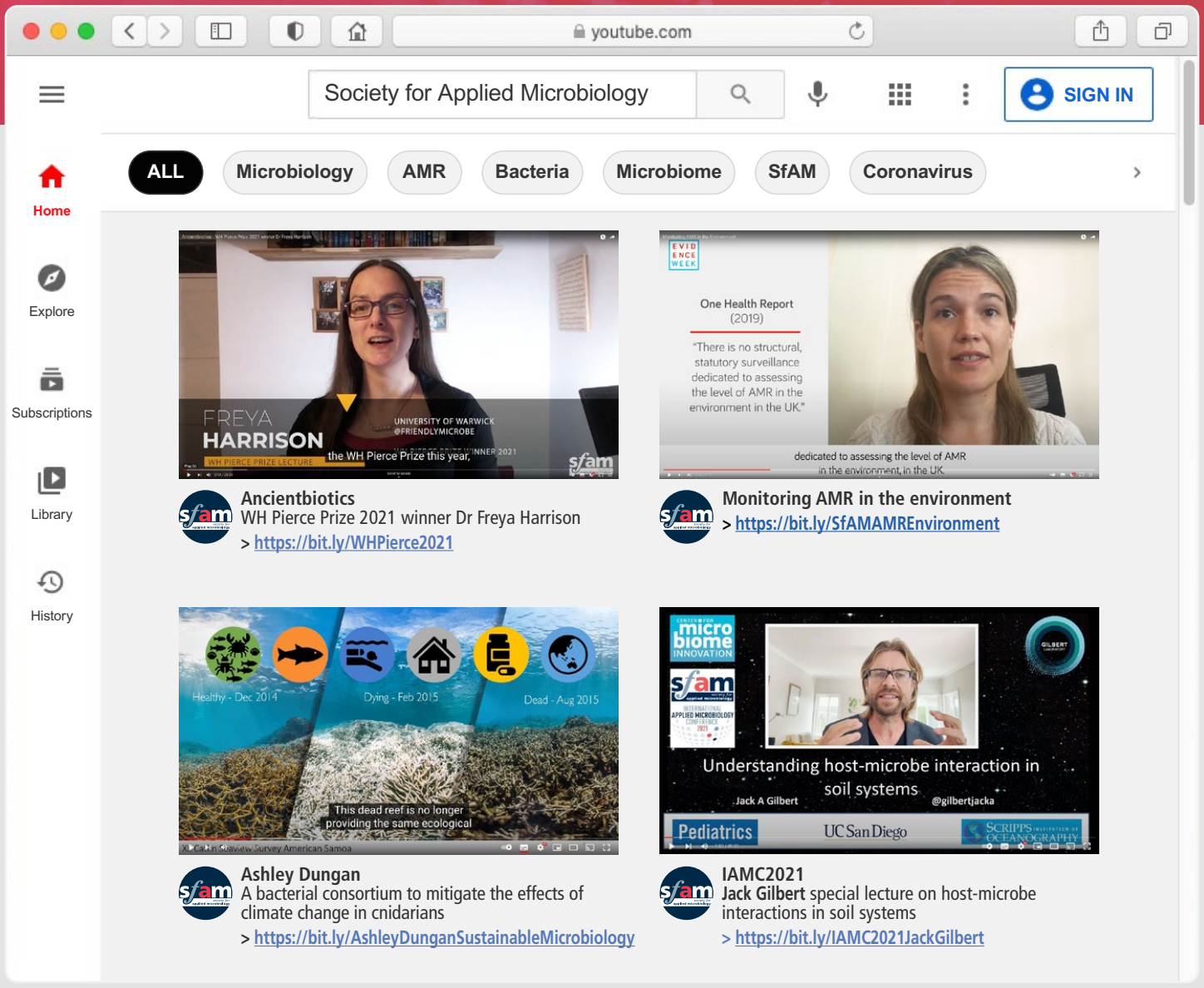
SfAM's full position statement on the impacts of COVID-19 on short-term research contracts can be found on the website.

Have you heard? SfAM is now on YouTube

Robert Millar
Digital Communications and Engagement Officer

With all the digital content we've been generating in the past year, we wanted to make it more accessible to watch our digital events and other activities.

Head to...
https://bit.ly/SfAMYouTube
to subscribe and watch some of our latest events!

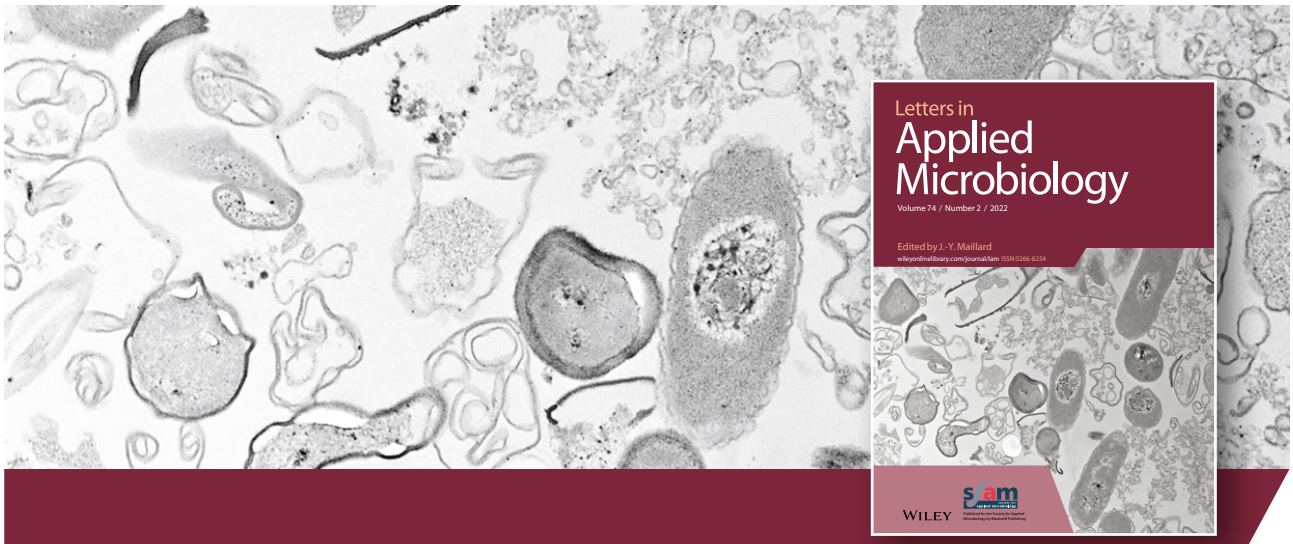


Ancientbiotics
WH Pierce Prize 2021 winner Dr Freya Harrison
> https://bit.ly/WHPierce2021

Monitoring AMR in the environment
> https://bit.ly/SfAMAMREnvironment

Ashley Dungan
A bacterial consortium to mitigate the effects of climate change in cnidarians
> https://bit.ly/AshleyDunganSustainableMicrobiology

IAMC2021
Jack Gilbert special lecture on host-microbe interactions in soil systems
> https://bit.ly/IAMC2021JackGilbert



Letters in
Applied Microbiology

Sustainable bio-bricks prepared with synthetic urine enabled by biomineralisation reactions

Fang C, Mi T, Achal V. Sustainable bio-bricks prepared with synthetic urine enabled by biomineralisation reactions. *Letters in Applied Microbiology* 2021; 73, 793–799

Available from

https://onlinelibrary.wiley.com/doi/abs/10.1111/lam.13574

Despite the fact that bricks are one of the oldest building materials still used in modern construction, their manufacture has a significant impact on the environment. Could there be a way to produce sustainable bricks? Looking at the immense potential of microbes, we can see how bacteria play the role of magic architects by precipitating the carbonate minerals that bind sand particles together to form sustainable bricks.

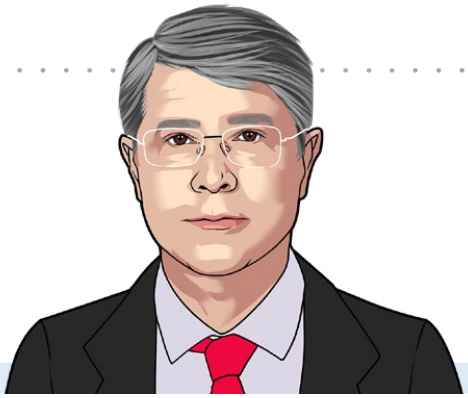
The ureolytic bacteria carry out the carbonate precipitation necessary for brick production. A major challenge in this process is the cost-effective use of expensive urea as a substrate, so microbiologists from the Guangdong Technion – Israel Institute of Technology grew the ureolytic bacterium *Lysinibacillus fusiformis* in urine, then used it to create bio-bricks. They were made of clay and cement, but their mineralisation was fuelled by biological activity instead of heat.

The study found that the bio-bricks produced had a significant compressive strength that was 59% higher than control bricks, and porosity was reduced by 41%. The research concluded that ureolytic bacteria precipitated more minerals in urine media compared with urea as a substrate, resulting in improved engineering properties of produced bio-bricks.

The research revealed the process of microbially induced mineral precipitation towards sustainable brick production with urine that could be applied in future related work.

Varenyam Achal
Professor, Guangdong Technion – Israel Institute of Technology, China

An interview with Juan Luis Ramos



Editor-in-Chief of ***Microbial Biotechnology***, *Zaidín Experimental Station, Granada, Spain*

How does it feel to be the new Editor-in-Chief (EiC) of *Microbial Biotechnology* (MBT) and how would you describe your role?

I feel really honoured to be the new EiC for the journal. I have been an associate editor since the very beginning, and I feel privileged. My term started in January, but I have been working since mid-July with Ken Timmis, founder of the journal, to have a smooth transition and I can honestly say that after 14 years as an associate editor I am discovering new angles in the journal. I have already started to work with the associate editors to define quality and excellence, to identify new editors, to outline strategic plans etc. Together with SfAM personnel and Wiley, our publisher, we are working on how to ease all the steps in the publication process and related items. I would say that the transition period is keeping me busy and once my term started the load increased, but I am more than willing to take on the challenge also as a service to the applied microbiology community.

MBT covers a lot of ground, from pharmaceuticals to nanotechnology and systems analysis. How do you make a final decision on which articles go into the journal?

First of all, I must stress that MBT is one of the five journals published by SfAM and we are highly committed with both our members and our readers to cover as many different issues related to applied microbiology and biotechnology as possible. We could say that we are a 'generalist journal', which means that all types of manuscripts related to microbial biotechnology, from very basic and fundamental science to very applied aspects, are welcome. What dictates acceptance is science quality and it is not only my commitment, but also that of all the editors and members of the Editorial Board.

You have worked extensively on the genomic and biotechnological potential of *Pseudomonas putida*. How important do you think the role of *P. putida* will be in the future of crop management and energy production?

A significant part of my work has been directed towards understanding the physiology of *Pseudomonas* in different niches – polluted soils, contaminated waters or the rhizosphere of plants. What I wanted to unravel is how they live, how they respond to different stimuli and environmental cues, and how they communicate with other inhabitants in those niches. It has been a fascinating journey with many collaborators from different countries. My experience with *Pseudomonas*, a rhizosphere microorganism able to promote plant growth, has been a focus of my research efforts and I was even co-founder of a start-up company devoted to the development of new approaches for the use of *Pseudomonas* in agriculture. *Pseudomonas* is also one of those microbes that grows effectively in fermenters, and for the last decade I have been working on the exploitation of *Pseudomonas*, yeast and fungi to convert lignocellulosic materials into added-value chemicals.

Can you share with us some of your thoughts for the future of the journal?

First of all, thanks to the work of past and present editors and our Editorial Board, the journal has reached a reference position in the field. As I have mentioned before, we are committed to quality and we would like to bring the journal into the top 10% of all journals in the field of biotechnology. We do not have a specific strategy yet, but we are fully committed to publish only the best science in the area of microbial biotechnology.

We have incorporated two new associate editors, Davinia Salvachua and Sepideh Pakpour – they are our editors from the North American side and both are young, consolidated scientists working in the area of biofuel/bioreactors and microbiome/medical devices. They broaden the scope of expertise of our current team.

MBT is a pioneer in the publication of Special Issues as a way to provide readers with a number of articles on hot scientific issues. Our latest Special Issue is being published this month and deals with synthetic biology. It has taken a bit longer to collect all of the articles because of the different pace of submissions, the need for modifications etc. In a brainstorming Zoom meeting with Pablo Nikel and Wei Huang (two of our associate editors) we concluded that with 'hot' areas it is not so good to keep articles on hold, and we decided to create a completely new section in the journal on 'Biology Engineering and Synthetic Biology' as a way to promote this field. It is having a real impact in all grounds of biotechnology. We will also have a new section called 'Patent Features'

in which José-Luis García will help MBT to identify hot areas where patents can be the basis for future developments. I have worked in a large private company for 4 years and I am aware that scientists in companies may not always be able to publish their work until patents have been filed. Biotechnology companies are part of the body of applied microbiology and this section may be a door for scientists in companies to contribute to the journal.

What advice would you give to our ECS members, or those looking to submit a manuscript for the first time?

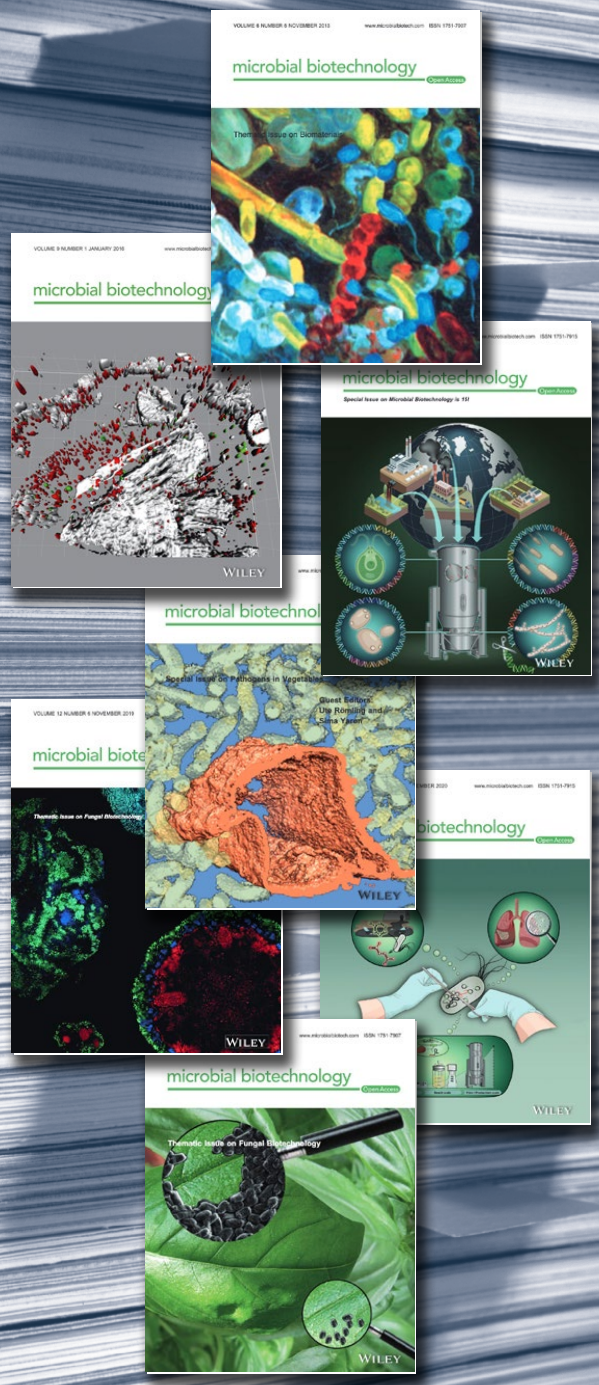
I would tell them not to hesitate or be afraid; the submission process for manuscripts is user-friendly and the editors handle the manuscripts with dedication and find excellent reviewers to provide feedback. On average we respond in four to five weeks after the manuscript's submission. One of our aims is to work with our community to ease the process and we hope that new submitters can provide us with their own feedback to improve the journal's operational system.

How would you advise authors to handle recommendations and criticism of their work from reviewers?

To make a long story short, authors should absolutely accept recommendations and criticisms since they are made in good faith and with the sole aim of improving the science, the presentation or the way in which the article is written. If you are not tired yet, I will tell you two short stories of my own experience. I have published a considerable number of papers – my first submission was to *Biochimica Biophysica Acta* – and it was accepted straightforwardly without modifications. I thought it was always going to be that way, but my second paper, submitted to *Applied and Environmental Microbiology*, received around 10 single-spaced A4 typewritten pages full of criticisms and suggestions for improvement. I was downright depressed, but my PhD supervisor sat down with me and opened my eyes to things I hadn't considered and that would make my paper better in many ways. We responded to each and every one of the comments and improved the manuscript immensely, so much so that the new version was far better than the first and was accepted for publication. In short, whether your manuscript is accepted or rejected, the peer-reviewing system aims at improving the submission and everything is done in good faith. Now that I come to think of it, I think that all my manuscripts have received criticisms and some have even been rejected straightaway, but I have always learnt something along the way.

Would you like to say something to our SfAM members?

MBT will work to promote science and to align biotech with job creation and sustainable development.



A career in biomedical science is not all that bad!

I am now coming towards the time when I can finally start to think about where my life is going to take me after over 40 years within biomedical science. I look back at some life-defining moments in my career to date.

Having left school as a 17-year-old with dyslexia I was not really ready to think about what sort of career I wanted to follow and got a job within retail while I tried to figure it all out. My first career-defining moment was when I was 19 years old; I popped my head into the Army Careers office and before I could blink, I was square bashing at Keogh Barracks as a Private Soldier within the Royal Army Medical Corps (RAMC). As a forces child I had always been drawn to a life in the military but wanted a trade that I could continue outside in 'Civvy Street'. I looked through the glossy brochure and came across a military pathology laboratory technician and thought that sounded interesting; 40 years on I am still working within the trade.

I spent around 15 years within the RAMC as a multidisciplined biomedical scientist and served in hospital laboratories in the UK, Hong Kong, Brunei and Belize. These ranged from a one-man field laboratory in Belize to large military hospital laboratories in Aldershot and Woolwich, which served both the military and local community. I gained multidisciplinary pathology experience and was as happy doing a post-mortem as I was processing a sample for uric acid or cross-matching blood for transfusion. Most techniques were totally manual then and I enjoyed the hands-on element of the role.

Neil Bentley OBE
PathAble Ltd, Cambridgeshire, UK

My second career-defining moment came when I was sent to microbiology to cover for sickness. I was blown away with being a 'pathogen detective' and knew from that moment that microbiology was where I wanted to stay. Having specialised in microbiology I completed my MSc and ended up teaching the subject at the Royal Army Medical College in Millbank, London. Whilst there, in 1992, my wife Allison and I had the first of our two children. When my son was three months old, I was sent on an unaccompanied posting to Belize, Central America, for six months. On my return, my son did not know who I was and that led to my next career-defining moment. We decided that I should leave the RAMC and continue my biomedical scientist career in Civvy Street.

I took a while to adapt to civilian life and worked for short periods of time in laboratories in Jersey and Exeter, before joining the Public Health Laboratory Service (PHLS) as a Senior Biomedical Scientist at Addenbrooke's Hospital in Cambridge. Working for the PHLS was like coming home and not unlike my career within the RAMC. It was at a time when modernisation and transformation within microbiology was the theme, and I thoroughly enjoyed helping the laboratory transform. We implemented molecular biology within virology, replacing much of the cell culture work, although I am still a bit sad that we got rid of the electron microscope. We transformed the bacteriology laboratory with Kiestra automation, one of the first laboratories to do so in the world. I had the opportunity to show the automation to HRH the Duke of Kent and he asked me to

summarise the automation before the tour. I told him it was like a sushi bar linked to an internet café for bacterial diagnostics. I worked my way up within the laboratory in Cambridge and became the Laboratory Manager and then the Regional Head of Operations for the East of England.

My next career-defining moment came in 2012 when I was asked to apply for a newly established role of Head of Technical Services for the Health Protection Agency (HPA; formerly PHLS) with a national remit to help modernise all the microbiology laboratories within HPA and subsequently Public Health England (PHE). I thoroughly enjoyed this role and it allowed me to see how the other laboratories worked within the organisation and more importantly to meet and get to know all the staff. I was able to build a small team and set about supporting the laboratories with their modernisation agenda. The molecular revolution had already started, and we concentrated on trying to standardise that across the organisation. A difficult task that has still got some way to go yet! We were able to successfully install bacteriology automation across all PHE laboratories.

Then came my biggest (to date) career-defining moment. In 2014, while in the Head of Technical Services role, I was contacted by an old army colleague, Dr Tim Brooks, who runs the PHE Rare and Imported Pathogen Laboratory (RIPL). He asked me if I would 'volunteer' to help with the emerging Ebola crisis in West Africa. I of course said yes, as this was the first time that I could combine my military, microbiology and public health skills. In September that year we set out to build, equip and run three field laboratories within Sierra Leone to assist with the epidemic. The starting point was finding out where could we get water and electricity and where we could go for a wee! The labs were built in an incredibly short time and opened to provide molecular Ebola testing and malaria lateral flow testing within weeks. After construction, my role was to technically lead the labs dotted around Sierra Leone, and I was fortunate enough to travel between the labs. It became quickly apparent that providing a diagnostic service was not enough. The samples were not getting to the labs quickly enough from the Ebola holding centres. These were usually tents and patients spent days in them until they got the test results, a perfect place for viral transmission. We put in a number of simple measures to get samples to the lab as quickly as possible and were able to reduce turnaround times from 5–6 days to within 24 hours. My proudest moment! Between 2014 and 2017, I spent around a year in Sierra Leone and for that I was awarded an OBE for services to Public Health by HRH Prince Charles in 2015 and an Honorary Doctorate from Anglia Ruskin University in 2018.

Next came the current COVID-19 pandemic and as Head of Technical Services I led the team to implement SARS-CoV-2 testing across PHE. An interesting time, as we can all remember! In 2020 I was asked to help support the COVID-19 Genomics UK (COG-UK) consortium as the Deputy Director of the Pathogen Genomics Programme, a role that I enjoyed immensely but, with my body and mind beginning to slow down somewhat, I decided to open a different chapter. So, after 40 years' public service I decided to make a career change with part-time working within the biomedical science commercial sector. Let's see what tomorrow will bring!

Remember that life is what you make it; follow the dream and smash through those glass ceilings – it's only out-dated tradition and bureaucracy that put them there!

LONDON'S MICROBIOTA

Making us keen for quinine

Readers familiar with the nursery rhyme '*Pop goes the weasel*' may be pleased to hear that while many of its allusions may now be obscure or lost to us, it is still possible to go 'Up and down the City Road and in and out of the Eagle'.

City Road was constructed in 1761 and remains a major thoroughfare between The Angel, Islington and Finsbury Square. The Eagle Tavern was established towards its northern end in the early 19th century and became 'The Royal Grecian Theatre' for a while before reverting to its original name when it was rebuilt in 1901. Today, Greek drama is no longer on offer though its website does highlight alternative attractions such as a courtyard garden and a weekly quiz.

In 1820, near the Eagle, City Road also became the site of a canal basin serving the Regents Canal. Here, goods could be offloaded from canal boats and transported the short distance to the City by wagon. With ready access to industrial towns throughout the country, the London Docks and the City, other businesses were attracted to the vicinity including some with a microbiological flavour. At the Anti-dry Rot Company, for example, wood was protected against decay by immersing it in tanks of mercuric chloride solution, a process known as kyanising after its inventor, the Irishman John Howard Kyan, who had demonstrated its efficacy to the Admiralty by burying treated wood in a 'fungus pit' in Woolwich for three years without apparent deterioration. Slightly more tangential, the City Road Basin was also home to W. Pitt and Co., the first successful producer of carbonated tonic water.

Tonic water's distinctive bitter flavour (and its fluorescence under UV light) derive from quinine, a quinoline alkaloid found in the bark of the cinchona tree, native to the eastern slopes of the Andes. Its antimalarial properties were first recorded in the 1630s by an Augustin monk who described it as being known locally as the fever tree. Consumption of an extract of cinchona bark to treat malaria spread rapidly despite objections from some who associated the practice with Catholicism. Ardent Protestant Oliver Cromwell, for example, refused to take 'Jesuit's bark' shortly before his demise from a combination of malaria and kidney stone disease. Cinchona bark appeared in the London Pharmacopoeia in 1677 and when the alkaloids responsible for its activity were isolated and identified by French chemists Pelletier and Caventou in 1817, quinine became the first chemical compound used to treat an infectious disease. Its additional value as an antimalarial prophylactic was formally established by the Scottish physician William Balfour Baikie in 1854.

Martin Adams
SfAM President 2011–2014

The malarial parasite *Plasmodium* is transmitted to humans by the bite of the female *Anopheles* mosquito. During its complex life cycle the parasite spends time multiplying in the red blood cells of an infected person at the expense of haemoglobin, utilising the globin protein and detoxifying the residual haem by converting it to haemozoin, an insoluble crystalline brown pigment, which is stored in the parasite's food vacuole. Quinine, like chloroquine, interferes with this process, killing the parasite as toxic levels of haem accumulate within its body.

To make the bitter-tasting remedy more palatable it was often consumed mixed with wine or a potable spirit such as gin or rum. This practice in turn led to the production of 'tonic wines' generally extolled as a tonic and aid to digestion. These contained cinchona bark extract, and later quinine itself, dissolved in wine, usually at levels conferring flavour but insufficient for malaria prophylaxis or treatment. One surviving example of these is the French aperitif Dubonnet, notable for having been a favourite tipple of the late Queen Mother. Whether her impressive longevity (she lived to be 101) was attributable to this is a matter of speculation.

Since carbonated water (first described by Joseph Priestley in 1772) had also acquired a reputation as a panacea, its combination with quinine seems to have been an inevitability. There was short-lived production of Quinine Soda Water in 1835 in Bristol but the first successful product appears to have been Pitt's Aerated Tonic Water based on a patent of 1858 issued to Erasmus Bond. It was marketed, not as an antimalarial, but for giving 'strength to the stomach and tone to the whole nervous system' though medical endorsements, including one by the famous physician and microscopist Arthur Hill Hassall, gave great emphasis to its refreshing qualities. Pitt's tonic water was followed by others including, in 1870, 'Indian Tonic Water' from a London-based company founded by Johann Jacob Schweppe using a similar recipe but employing citric acid as a more agreeable acidulant than the sulphuric acid used by Pitt. Schweppe's success helped establish an association of tonic water with India, the Empire more generally, and the urban myth that it was used to counter malaria, the scourge of empire builders. In fact, quinine concentrations in tonic water are typically below 83 mg/L (the USFDA limit), necessitating consumption of prodigious quantities to achieve anything approaching a clinically useful dose of 500–1000 mg. The more prosaic truth it seems is that tonic water, mixed perhaps with the merest smear of gin, is the basis of a fortifying and refreshing drink well suited to hotter climes.

Despite significant successes of mosquito control measures, quinine and other, more recent, antimalarials, malaria remains a major world health problem to this day with 241 million cases worldwide in 2020 with 627,000 deaths, mostly in children under five in sub-Saharan Africa. Recently however, hopes of further progress have risen when, in October 2021, after more than 30 years effort to develop an effective vaccine, the WHO recommended the RTS,S vaccine for use in children.

Today Pitt's factory has long gone from its home in Wharf Road and the City Road Canal Basin has been extensively redeveloped. At its southern end, it is now reduced to a rather bleak patch of water, occasionally traversed by the Islington Boat Club, and an unadorned concrete piazza. Mind you, it's still only a short walk to the Eagle…

Looking towards a brighter 2022

Although the end of 2021 was somewhat turbulent, due to the wave of the new Omicron variant we were still able to complete the year's plans with a few choice events and enthusiasm for more.

In November, we launched the eagerly anticipated *Evolving 5-19 Biology*, our framework for the biosciences curriculum across the school years. The report, which includes recommendations for primary and secondary bioscience education, grew from seven years of extensive research and input from 10 RSB groups and committees, as well as a number of member organisations.

By presenting a coherent and cohesive approach to biology education, the framework sets out RSB's vision for biology curricula across all four UK nations.

We hope the document will go on to influence policymakers, curriculum designers and specification designers across the UK, as well as providing support for teachers and school leaders in developing and positioning the biology curriculum within their schools.

The report was launched through an online event with an audience of science and education organisations, government departments, regulatory bodies, awarding organisations and educational institutes and can now be found and read on our website.

Also in November, we hosted our second outreach and engagement symposium, in partnership with a group from among Membership Organisations on our Outreach and Engagement Working Group.

Mark Downs CSci FRSB
Chief Executive of the Royal Society of Biology

Over the course of three days we heard from engagement professionals, researchers and sector leaders and discussed some of the challenges in bringing science to the public during the pandemic, as well as plans and predictions for the future.

With a new year, it seems apt to reflect on our progress and start planning for the future – something we at the RSB have been doing as we developed our new three-year plan.

We've put together an ambitious plan for the next three years that will draw on the successes we have already seen in our first decade. Membership will of course remain at the heart of our Society, and we are hoping to grow our network to 20,000 individuals; an ambitious but achievable target.

We'll be reviewing the services we provide such as seminars, networking, CPD and training schemes to ensure members continue to receive the best level of support possible. We will also be enhancing the suite of professional registers we offer to help members receive the recognition they deserve.

Our role is to also ensure our members' views and expertise are amplified. We will continue to provide a unified voice for the biosciences through the collective skillsets and knowledge of our broad membership and actively engage with science and education policy.

With the launch of our curriculum framework, we can strengthen the influence we have on shaping biosciences education and ensure the next generation of scientists get the best start in life. We'll also continue to grow our accreditation schemes for degree courses and explore the potential for new types of accreditation.

Setting standards, supporting professionals and advocating for the value and wonder of biology are core themes across the next three years. Looking beyond 2024, we are also planning how the Society will develop through the next decade. With our growing membership and broad spectrum of membership organisations such as SfAM, our overall priority is to bring together and support diverse bioscience networks working closely with sister organisations, especially in chemistry, physics and mathematics.

We also want to work towards a greener future – the climate emergency will lead to devastating effects if we don't ensure that biological knowledge is put to good use. In partnership with our membership organisations and members, we hope to develop a collective view on actions to help the sector move towards net zero.

We know that biology will play a key role in how we address future global challenges, and our mission remains to support the sector that has the power to change the world.

We know that biology will play a key role in how we address future global challenges

Defining and measuring success

It might seem counterintuitive to begin 2022 by taking stock of all our policy work in 2021. But as you'll see in this section, we want to reflect on 2021 to determine what worked, what didn't and what we learned so we can identify what we should carry into the future. More importantly, we want you, our members, to see what we're doing, why and how.

Despite 2021 proving to be just as unpredictable as 2020, the Policy Subcommittee and Team had another highly productive and successful year. Some highlights included delivering an online webinar where members could meet SfAM's Policy Subcommittee, producing two case studies on antimicrobial resistance (AMR), hosting a webinar discussing our *Impact of COVID-19 on AMR* Case Study, and hosting a pod on our *AMR in the Environment* Case Study at Evidence Week in Parliament. These are in addition to our business-as-usual tasks, including responding to nine consultations and sharing equality, diversity, and inclusion (ED&I) best practices and training throughout the year.

We demonstrated through 2021 how productive SfAM can be given its resources, both financial and human. When we compare ourselves with other learned societies it is clear that greater financial input does not always equal greater policy output. How resources are allocated, such as the number of staff members and committee members, has a greater influence on how productive policy teams are, and showcasing our policy work is just as important as producing it. If the public, including members and parliamentarians, don't have sight of our work, then they can't engage and collaborate with us.

Lisa Rivera
Policy and Public Affairs Manager

We are working smarter, not harder, when it comes to advocating on behalf of our members and their interests and this attention to resource allocation is something we are keen to take forward into 2022 and beyond. Thus, we have made it a priority to continuously evaluate the impact of our work and direct our resources to areas that will have the greatest benefit for our members.

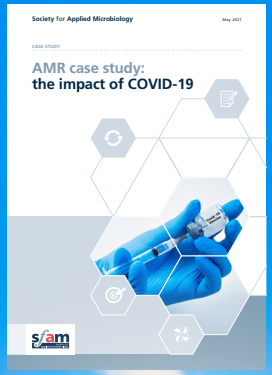
Our ED&I work is at the heart of all our policy projects. As members of EDIS, we produced an end-of-year review of all SfAM's ED&I work throughout 2021. As the review (provided in the following sections) exemplifies, we do not focus our efforts on one under-represented group or challenge in the science sector, but instead work to progress diversity and inclusivity across many. By doing so, we hope to give a voice to all our members and better embed change systemically.

Most importantly, these exercises have provided us an opportunity to assess how we, ourselves, define and measure what policy and ED&I success looks like. We plan on using this insight to improve how we evaluate our policy and ED&I impact going forward and identify the best areas and resources we can use to engage and influence policymakers on your behalf. We hope this not only assures our members but also encourages you to keep engaging with us so we can best represent you.

edis
Equality, Diversity and Inclusion in Science and Health

EVIDENCE WEEK 2021

UN CLIMATE CHANGE CONFERENCE UK 2021
IN PARTNERSHIP WITH ITALY



2021 Equality, Diversity and Inclusion Review

As a member of EDIS, each year we are required to summarise all the actions we undertake throughout the year to prove our commitment to being more equitable, inclusive and diverse. As you can see by all our activities below, we are committed to improving ED&I practices within SfAM and the science sector. We welcome any and all input from our members so that we can ensure we are including and representing everyone.

Lisa Rivera
Policy and Public Affairs Manager

AREA

Anti-racism or race equity work

ACTION ANTI-RACISM WORKING GROUP (ARWG)

In January 2021, SfAM established an anti-racism working group (ARWG) to identify any forms of systemic racism that touch the lives of our team, committees and members – with a goal of ensuring SfAM is an anti-racist organisation. The ARWG currently has 14 members that work on 3 workstreams:

- **Support**
- **Internal work**
- **Outreach**

We have also provided ARWG members with the opportunity to participate in Wellcome's Anti-racism Principles and Toolkit training and Race Reflections' Beyond Bias training.

AREA

Collaboration

ACTION DAPHNE JACKSON TRUST (DJT)

In July 2021, SfAM agreed to support a three year fully funded Daphne Jackson Trust Fellowship. The applicant is expected to begin their fellowship in Spring 2022 pending award assessment in February.

ACTION ALL-PARTY PARLIAMENTARY GROUP (APPG) ON DIVERSITY AND INCLUSION IN STEM

SfAM was cited seven times in the APPG's 'Equity in the STEM workforce' report, published in July 2021. Since this report, Clare Taylor represented SfAM at a roundtable hosted by Baroness Sally Morgan on 'How does the UK government advance and inhibit equity and inclusive cultures within the STEM workforce?'

Please do contact us at **policy@sfam.org.uk** if you would like to discuss our current work, suggest new ideas or get involved

AREA

Diversity monitoring

ACTION SfAM'S DIVERSITY MONITORING SURVEY

The last diversity data on SfAM's committees was collected in 2019, focused only on gender composition. Using Wellcome's Diversity and Inclusion Survey (DAISY) guidance and EDIS' diversity data collection guidance, we designed and issued a diversity monitoring survey to all SfAM committees and staff in December 2021.

ACTION PRIDE MONTH SURVEY

In June, SfAM promoted a Pride Month survey, offering free membership to anyone who completed the survey. We received 49 responses. We are currently working on implementing an LGBTQI action plan for 2022 based on the responses.

AREA

The legacy of COVID-19

ACTION POSITION STATEMENT ON SHORT-TERM RESEARCH CONTRACTS

In response to our COVID-19 membership survey, we established a COVID-19 Task and Finish Group on Social Impacts and Equality, which produced SfAM's Position Statement in support of researchers on short-term research contracts. We received responses from the Department for Business, Energy and Industrial Strategy (BEIS) and Chi Onwurah on this statement's recommendations.

ACTION NEW HARDSHIP GRANT

SfAM has implemented a new hardship grant for postdoctoral members because of the concerns raised by our members on short-term research contracts.

AREA

Events

ACTION EQUALITY IMPACT ASSESSMENTS

SfAM have adopted Equality Impact Assessments to assess the impact of a policy/event/funding scheme on groups with protected characteristics. These also serve as a transparent way of demonstrating consideration of equality and inclusion.

ACTION ECS SYMPOSIUM COMMUNITY CORNER

The Welfare team hosted community corner sessions focused on Awareness to Action and Women and Minorities in STEM. Lillian Hunt, EDIS Programme Lead, and Chi Onwurah, Shadow Minister for Industrial Strategy, Science and Innovation, were our guest speakers.

ACTION CODE OF CONDUCT

We have amended SfAM's Code of Conduct for Events to include recommendations on the provision of alcohol at future in-person events.

Diversity Monitoring Survey of SfAM Committees and Staff

A new survey, issued by SfAM in 2021, offers insight into representation and inclusion across the committees and staff of the Society for Applied Microbiology.

To ensure we were asking only the questions we needed in an appropriate manner, we developed a diversity monitoring questionnaire utilising Wellcome's Diversity and Inclusion Survey (DAISY) question guidance and the diversity data collection guide from EDIS. As part of this, we designed a diversity monitoring infographic to explain our rationale and improve response rates, which ultimately improves the reliability, reproducibility and ability to interpret the data.

The Diversity Monitoring Survey was sent to 64 SfAM staff and committee members and 50 members responded; this equates to an overall response rate of **78.1%**.

YES **34%**

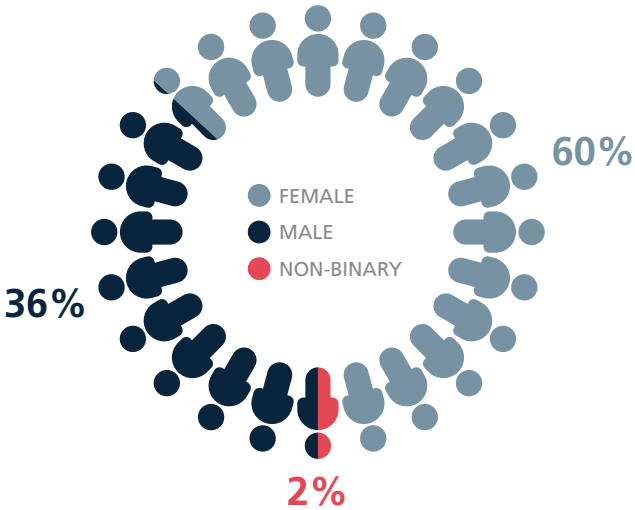
NO **66%**

Disability and long-term health conditions

34% of SfAM staff and committee members consider themselves to have a disability or long-term condition such as dyslexia, diabetes, arthritis, a heart condition or a mental health condition and meet the Equality Act definition of disability. This was higher than the **12.74%** of SfAM membership survey respondents who considered themselves to have a disability or long-term health condition. Distinct to the membership survey, this question was not skipped by any of the survey respondents.

Gender

60% of survey respondents were female, which is a substantial improvement from the gender balance of the SfAM Executive Committee in early 2019, which consisted of **62%** male and **38%** female members. In addition, **4%** of SfAM staff and committee members who responded to the survey are non-binary. This could signify the impact of the positive steps taken by SfAM to place EDI at the heart of the Society. With regard to gender identity, **98%** of survey respondents did not identify as trans and **2%** preferred not to say.



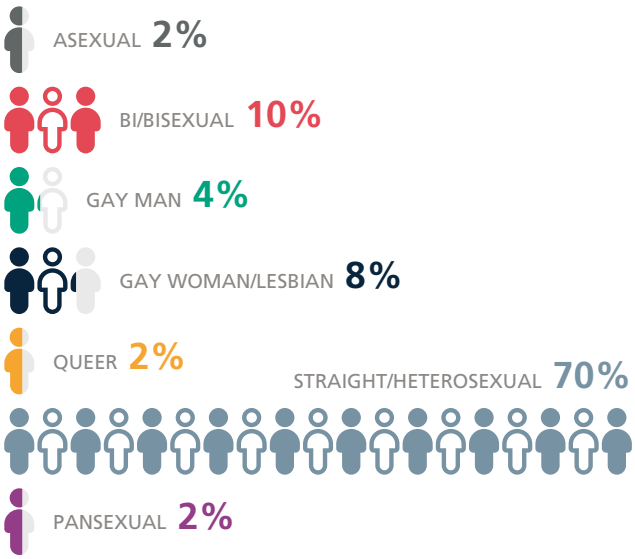
Lucky Cullen
Science Policy & Diversity Officer

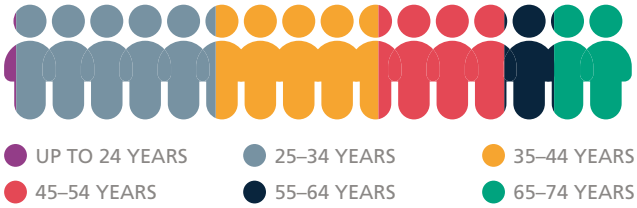
Ethnicity

SfAM staff and committees are predominantly white with **76%** from a white background and ethnic minorities comprising **24%** of SfAM staff and committee members who responded to the survey. This emphasises the need for considerable improvement in the representation of individuals from ethnic backgrounds within our staff and committees.

Sexual orientation

When we asked SfAM staff and committee members what best describes their sexual orientation, **70%** of repondents were straight compared with the **30%** of respondents who did not consider themselves to be heterosexual. We can compare this with our membership survey, which showed **75.7%** of members identified as heterosexual.



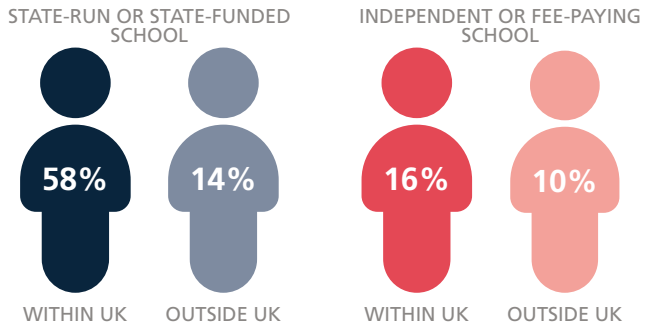


Age

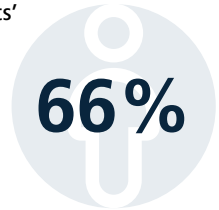
The survey found that **32%** of respondents fell within the age category of 25–34 years and **60%** of SfAM staff and committee members were below the age of 45. This age diversity question was not skipped by any respondents, neither did anyone prefer not to say.

Socio-economic variables

We asked our staff and committee members what type of school they attended for the majority of time between the ages of 11 and 16. We have included diversity data for education both within the UK and outside the UK. **58%** of survey respondents attended a state-run or state-funded school (non-selective/selective) within the UK compared with **14%** outside of the UK. This can be compared with the **16%** of respondents who attended an independent or fee-paying school in the UK and **10%** overseas.



Following that, we asked if respondents' parents or guardians had completed a university degree course or equivalent by the time the respondents were aged 18 (e.g. BA, BSc or higher) and our survey revealed **66%** of respondents' parents or guardians had not completed a university degree course or equivalent by the time respondents were 18 years old.



Caring responsibilities

30.6% of SfAM staff and committee members had some form of caring responsibilities. This includes carers of children under 18, disabled children and disabled adults (over the age of 18) as well as carers of older people (age 65 and older). This question was skipped by one of the survey respondents.

Aqua Methods Uganda

SfAM member Timothy Kayondo was awarded £15,000 as part of the Africa Prize for Engineering Innovation, awarded by the Royal Academy of Engineering. As Africa's biggest prize for engineering, it was launched in March 2014 to 'stimulate, celebrate and reward innovation and entrepreneurship across sub-Saharan Africa'.

Timothy Kayondo

Royal Academy of Engineering, UK and Resilient Africa Network – Makerere University School of Public Health, Uganda

INNOVATION in AFRICA

The prize was awarded to Timothy's company 'Aqua Methods Uganda' for the development of a portable, digitalised water purification unit constructed from locally sourced materials that would otherwise have been considered refuse. Once installed, the devices are entirely solar powered, and are currently being used in more than 50 schools, two refugee camps and health centres in northern Uganda, where over 200,000 refugees are hosted.

The units carry out filtration and disinfection of contaminated water in a two-stage process using cleanly extracted sand and gravel in the first stage, followed by activated carbon from animal bones, cassava peelings and coconut shells from would-be waste material in the second. Disinfection is then achieved using solar ultra-violet light to damage the microbes and disinfect the water ecologically.

In the finished unit, all the filtration and disinfection components are then assembled in a cleverly designed, portable box through which local contaminated water can be passed in order for it to be purified for human consumption.

The units have a number of other innovative and unique features that helped Timothy secure the prize:

- a metal detector designed using mobile sensors which aids in the analysis of key physical water parameters *in situ* (eliminates the need to transfer water samples to distant laboratories for analysis).
- a digitalised water key as a way of creating a prepaid water metering solution through mobile phones (ensures easy accessibility of the clean water by the end users and self-sustainability of the enterprise itself).

Timothy hopes that these units will now give access to improved sanitation for many marginalised communities across Uganda where sustainable access to safe water is presently at risk.

ROYAL ACADEMY OF **ENGINEERING**

THE AFRICA PRIZE FOR ENGINEERING INNOVATION

The latest news, views and microbiological developments

KWIK-STIK™ from Microbiologics

Laboratories throughout the world have been praising the KWIK-STIK for decades. That's because its simple, all-inclusive design makes life easier for lab techs while reducing chances for errors.

Each KWIK-STIK contains a qualitative lyophilized microorganism pellet, ampoule of hydrating fluid and inoculating swab. Everything you need to grow reference cultures for QC testing is included in this one handy device.

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- Accredited reference material under ISO 17034 standard
- Over 900 strains available
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- Strains are less than or equal to three passages from reference culture
- Ready-to-use format saves time and money

Further information

Visit: www.bioconnections.net
Tel: **+44 (0)1782 516010**
Email: **welcome@bioconnections.co.uk**

Stackable Anaerobic 'Jar' Launched

New from Don Whitley Scientific is the rectangular, transparent and stackable anaerobic jar – the Whitley IncuBox.

IncuBox is ideal for use with the Whitley Jar Gassing System (evacuation/replacement method) or as a stand-alone system to be used with gas generation sachets. It can be used for the isolation and cultivation of anaerobic and microaerobic organisms, and for cell culture applications.

Because of the shape of the vessel, and as no connectors or valves protrude beyond the outer surface of the lid, they can be stacked on top of each other inside an incubator or on the bench saving valuable space. The main jar (without the lid in place and with no samples inside) can be nested with other empty jars to ensure work in progress takes up the least possible amount of working space.

IncuBox will accommodate either 12-14 x 90mm Petri dishes or 5 x standard multi-well plates. The four latches used to open and close the box are permanently attached to the lid so there are no loose parts to lose.

Further information

Visit: www.dwscientific.com
Tel: **+44 (0)1274 595728**
Email: **sales@dwscientific.co.uk**

Validated ASFV dtec-qPCR kit may help to control a recent Italian outbreak of African swine fever

New year 2022 has started with some fear for the world of pigs. On January 7, the Italian official veterinary services warned of the presence of African swine fever virus (ASFV) in samples collected from the carcass of a boar. ASFV is an emerging virus with a high mortality rate, causing huge economic losses in many countries. In the absence of effective vaccines and therapies, fast and sensitive ASFV detection is essential for surveillance and control of this disease. Genetic PCR Solutions™ developed an innovative real-time PCR kit for ASFV detection in a so-called MONODOSE format (only needs adding an extracted

sample to ready-to-use PCR tubes containing all dehydrated specific reagents). The assay was subjected to strict validation according to the UNE-EN ISO/IEC 17025 guidelines obtaining efficiencies greater than 98% (DL, 10 copies). Analytical specificity was assessed in silico by comparison of hundreds of described sequences. Inclusivity was evaluated with 21 isolates from the European Reference Laboratory for ASFV, INIA-CISA (Spain), and 8 reference samples from the Department of Veterinary Hygiene in Warsaw (Poland). Diagnostic validation by using 181 doped samples (blood, serum, kidney, heart, liver and tonsil), yielded 100% sensitivity and specificity. The assay was validated by the national reference laboratories of the Ministry of Agriculture, Fisheries and Food of Spain, registered as a diagnostic reagent (Ref.11033-RD), also by the corresponding Ministry of Bulgaria and, currently, it is being used by many laboratories.

Further information

Visit: www.geneticpcr.com
Tel: **+34 96 542 9901**
Email: **info@geneticpcr.com**

New chapter for 40 years of NCIMB Ltd

In April, NCIMB will celebrate 40 years as a limited company, and 2022 looks set be an exciting year!

NCIMB Ltd curates the UK's National Collection of Industrial, Food and Marine Bacteria – it's unusual for a national collection to be privately owned, and the National Collections of Industrial and Marine Bacteria were first established as part of the UK Civil Service in 1950 and 1958 respectively. They were transferred to University of Aberdeen before NCIMB was spun out in 1982, and ten years later, the National Collection of Food Bacteria was added to our remit. We've come a long way in 40 years – working closely with different industry sectors to develop services that meet their needs, including microbial identification, sequencing, qPCR, storage and contract research. The culture collection continues to develop as researchers deposit new strains, and we firmly believe it is an important genetic resource for the 21st century – strains within it could hold the solution to some of mankind's most urgent challenges.

We're delighted to announce that NCIMB will be moving to new, customised premises this year – it's an exciting new chapter for the company, and a great way to mark our anniversary. Building work is underway, and we can't wait to settle into our new home!

Further information

Visit: www.ncimb.com
Tel: **+44 (0)1224 009333**
Email: **enquiries@ncimb.com**

NCPV continuing to support pandemic research

NCPV has added two strains of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) to the collection to assist the scientific community with pandemic research.

SARS-CoV-2 strain B.1.1.7/N501Y/V1, clade 20I (Kent/Alpha lineage, cat no. 2111223v) is NCPV's first commercially available virus inactivated through X-ray irradiation. X-ray irradiated products are non-infectious whilst maintaining genome integrity and antigenic structures. Additionally, no residual toxic inactivation chemicals are present in the preparation.

SARS-CoV-2 strain B.1.1.529, clade 21K (Omicron lineage, GenBank reference: OM003685.1, cat no. 2112101v) is also now available to order.

These strains were identified through whole-genome sequencing, Nextclade (clades.nextstrain.org), and the Phylogenetic Assignment of Named Global Outbreak Lineages (PANGO Lineages, cov-lineages.org).

NCPV
National Collection of Pathogenic Viruses

Further information

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UK Health Security Agency

The UK Health Security Agency (UKHSA), the nation's new public health body focused on health protection and security, is now fully operational.

The UKHSA builds on the legacy of Public Health England (PHE), NHS Test and Trace and the Joint Biosecurity Centre to help keep the nation safe.

UKHSA will operate as an integral part of the public health system and the national security infrastructure, utilising state-of-the-art technologies and groundbreaking capabilities in data analytics and genomic surveillance to tackle coronavirus (COVID-19) and future threats locally, nationally and globally.

The immediate priority of UKHSA is to fight the COVID-19 pandemic. UKHSA will play a critical role in the route to developing vaccines effective against new and emerging variants. In the longer term, UKHSA will build on the infrastructure developed for COVID-19 to tackle and prevent other infectious diseases and external health threats. This work will include a strong focus on life sciences, strengthening relationships with academia, research organisations and industry that have developed and grown through the pandemic.

The pandemic has exposed the stark inequalities in our society and tackling these is a key part of UKHSA's mission. Throughout its work, UKHSA will seek to understand and influence the wide range of factors that determine health outcomes to help reduce the impacts on the most disadvantaged in our society.

Led by Dr Jenny Harries, the team at UKHSA will help ensure we keep COVID-19 under control – including through world-leading analysis and genomic testing for variants, support in the development of new vaccines and to build on the UK's existing public health expertise to protect us from new threats.

The UK has now sequenced more than a million genomes, and UKHSA will play a key role in maintaining the UK's position as a world leader in whole-genome sequencing (WGS). New variants can pose the most serious risk to global recovery from the pandemic. The New Variant Assessment Platform (NVAP) that sits within UKHSA will enable the UK's unique sequencing and variant assessment capabilities to support other countries' response to COVID-19, strengthening global health security and protecting people here and abroad.

UK Health Security Agency press office

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UKHSA priorities in 2021 to 2022

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