



**Microbes
and
Society
network
news
summer
2023**



Dear All

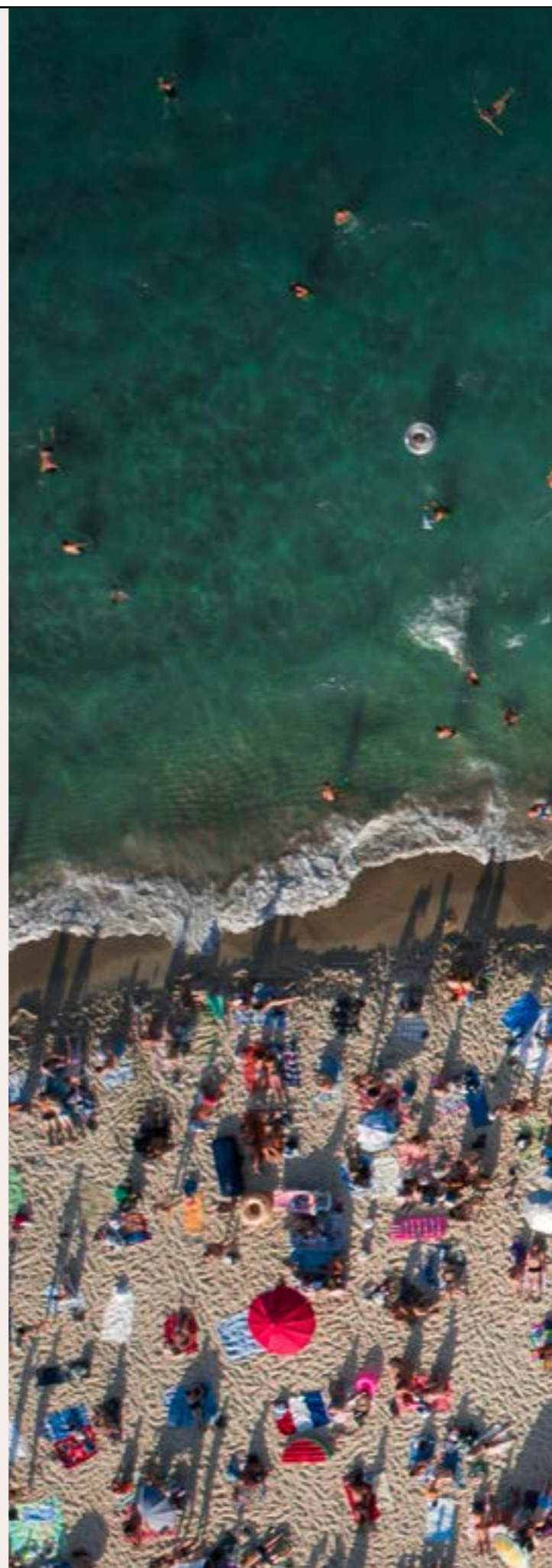
Welcome to the Microbes & Society summer newsletter!

We are busy planning our annual symposium, and look forward to welcoming you on 17 and 18 July at Penryn campus - make sure you register on Eventbrite for this so we can be sure of numbers.

There is also a Social Microbes event just around the corner on the **20 June** - all welcome via Zoom - again, register on Eventbrite (details in our events section)

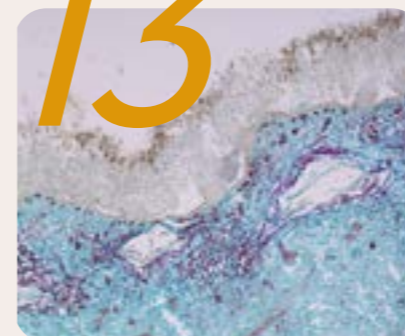
We also have a [new website](#), where you can view promotional videos, read up on the network aims, and find out latest news. We are also building a **Register of Expertise** of our members to aid with collaboration and networking - if your name isn't on the list yet, please get in touch with us via microbes-society@exeter.ac.uk with your research interests.

Steve, Edze, Jane and Will
Microbes & Society Network Co-Leads



Contents

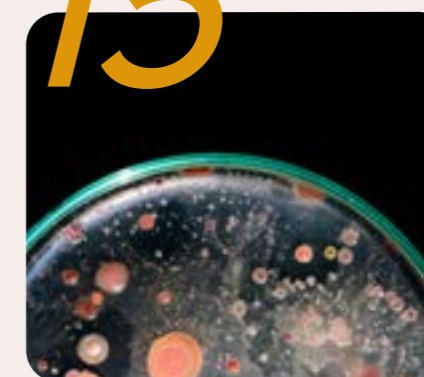
13



Funding opportunities

Closing calls and preannouncements

15



Latest publications

Latest research from across our network

13



Latest events

Online, hybrid and in-person

AMR latest	5
CMM latest	7
Microbiology latest	9
WCCEH latest	11

Microbes & Society Symposium 2023 Challenges:

- Food
- Climate Change
- Pathogens
- The Microbiome

17 - 18 July 2023, Penryn Campus

Register now



University
of Exeter

AMR news



Research Fellow Kasim Allel speaks on One Health Podcast



As part of his doctoral ties to the London School of Hygiene and Tropical medicine, **Kasim Allel** spoke on the One Health Podcast about the

links between antibiotic use in humans and in animals. You can listen to his findings [here](#).

Network members feature in Euronews antibiotic pollution documentary



ECEHH members **Will Gaze**, **Anne Leonard** and **Aimee Murray** featured in a Euronews documentary about antibiotic pollution. Speaking about their EU-funded research, Aimee said “It’s commonly thought that antibiotic pollution is more of a problem in low- and middle-income countries where they are producing the antibiotics and they have to discharge pharmaceutical waste, where they don’t have adequate sanitation infrastructure, but we showed that even in the UK there are sufficient levels of antibiotics to increase resistance.”

Gene editing tool could help reduce spread of antimicrobial resistance

An Exeter team led by **David Walker-Sunderhauf** has harnessed the CRISPR-Cas gene editing system, which can target specific sequences of DNA, and cuts through them when they are encountered. The researchers engineered a plasmid which can specifically target the resistance gene for Gentamicin – a commonly used antibiotic. [Read more here.](#)

Public aware of and accept use of bacteria-killing viruses as alternative to antibiotics, study shows

The public are in favour of the development of bacteria-killing viruses as an alternative to antibiotics – and more efforts to educate will make them significantly more likely to use the treatment, in a study conducted by **Sophie McCammon**, **Kirils Makarovs**, **Susan Banducci** and **Vicki Gold**. Sophie McCammon said, “The public desire for increased education is apparent. Expanding schemes which are interactively involving children in phage research not only generates excitement for the therapy now, but also promotes awareness in the generation likely to be treated with antibiotic alternatives.” [Read more here.](#)

Interested in joining the editorial board of a new journal?

A new journal, [npj Antimicrobials and Resistance](#), is looking for more members to sit on its editorial board. Please contact [Aimee Murray](#) (Associate Editor) in the first instance if interested.

The Last of Us: Could it really happen?

Elaine Bignell has written a guest post for the University of Exeter on whether the predictions made by post-apocalyptic HBO drama The Last of Us could really happen. [Read more](#)

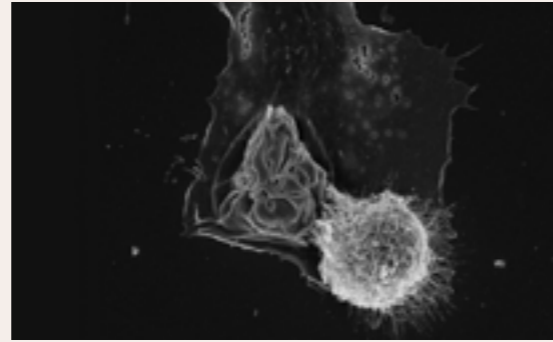


Image by Janine Hauelsen

“Devastating” fungal infections wiping out crops and threatening global food security, experts warn

Scientists have warned of the “devastating” impact that fungal disease in crops will have on global food supply unless agencies across the world come together to find new ways to combat infection. [Read more](#)

CMM researchers share work with public through Soapbox Science

Alison Gifford and Liliane Mukaremera spoke about the dangers of cryptococcal meningitis and the practical uses of yeasts respectively to the Exeter public earlier this month. They were part of a lineup of female STEM scientists, including other Exeter researchers, who were championing women’s contribution to STEM research. [Read more](#)



100 Black Women Professors Now

In April, Liliane Mukaremera spoke on BBC Radio Devon’s Voice of Change programme about the 100 Black Women Professors Now programme - you can catch it [here!](#)



CMM news

From the MRC Centre for Medical Mycology



Microbiology news

Phage structure captured for the first time, to benefit biotech applications

For the first time, Vicki Gold has revealed the structure of a filamentous phage, in research published in the journal Nature Communications. She said: “Phages form part of a very exciting and growing area of research, with a range of current and potential applications. Yet until now, we’ve not had a complete picture of what filamentous phages look like. We’ve now provided the first view, and understanding this will help us improve applications for phage into the future.”



Phage image based on that published in Gold et al.

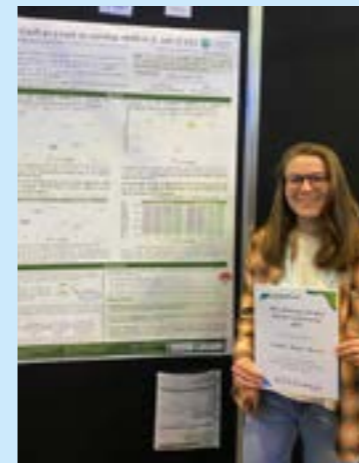
Elze Hesse speaks on Radio 4



Elze Hesse talked about her work on microbes on BBC Radio 4 in Costing the Earth - Save the Microbes (16 May, from 22:18 onwards). It was presented by author and biologist Gillian Burke. [Listen here](#)

Exeter academics a strong presence at Microbiology Society conference

M&S Network members presented talks and papers at the conference, including **Sarah Gurr**, **Adam Monier**, **Nick Harmer**, **Carolina Coelho** (organiser), **Emily Stevenson** and **April Hayes** (below centre and right, respectively). Claudia Morros (below left) received a prize for her poster on how CRISPR-Cas9 can be used as a tool to remove AMR from E. coli ST131. Congratulations Claudia!



John Dupre elected to The American Philosophical Society



Professor John Dupre is now a member of the American Philosophical Society, the oldest learned society in the United States of America. Early

members also included John Adams, Thomas Paine, James Madison, Alexander Hamilton, and John Marshall. In the 19th century, John James Audubon, Robert Fulton, Charles Darwin, Thomas Edison, and Louis Pasteur were among those elected. In the 20th century this included Albert Einstein, Robert Frost, and George Marshall. [Read more](#)

Steve Hinchliffe co-authors independent DEFRA report into Avian Influenza

As part of his role with Defra's Scientific Advisory Council, Steve Hinchliffe has co-authored 'Highly pathogenic avian influenza in Great



Britain: evaluation and future actions', which Defra's Chief Scientific Advisor states "provides highly valued insight which augments the expertise in Defra's Animal and Plant Health Agency, and a set of eleven clear recommendations. These insights will help guide Government thinking and actions". You can read the report [here](#).

Tributes flood in for Professor Henry Buller

Henry Buller, Professor of (more-than) Human Geography, sadly passed away in May. He was a key figure in the AMR Network, and a central pillar of Exeter's Geography community. Tributes to Henry can be found on his [staff profile](#); you can add your own tribute [via this form](#).



Portrait by Simon Ryder

Henry was a featured researcher in last year's AMR Network [Researching Resistance photographic exhibition](#). You can also read a spotlight on one of his latest papers, co-authored with Steve Hinchliffe, on page X.

Don't miss Social Microbes!

On 20th June, the WCCEH will host 'Social Microbes': a social-science focussed event exploring how the 'social' and the 'microbial' interact, how have microbial worlds shifted in relation to social changes, and how can we develop better interdisciplinary research. Limited in-person spaces, but will be streamed via Zoom. [Get tickets now!](#)



Events

Coming up

15 June 2023

Workshop: Meet Medical Mycology. 14.00 - 16.45, St Luke's. [Register here](#)

19 June 2023

5th Annual UK Cellular Microbiology Meeting. 12.00-15.00, LSHTM. [Register here.](#)

19 June 2023

Microbiology Seminar Series – 2.00-3.00 Penryn campus Exchange Green / Teams – all welcome! Email D.Walker-Sunderhauf@exeter.ac.uk for Teams link

20 June 2023

Open & Reproducible Science Series; Project management and version control in RStudio using RProjects and Git. 15.00 - 17.00, Penryn Peter Lanyon Seminar 03. [Register here](#)



20 June 2023

Social Microbes. 10.00-17.00, WCCEH Boardroom and via Zoom. [Register here](#)

20 June 2023

WCCEH Public Lecture 2023: Hannah Landecker, 'Metabolism is not a metaphor'. 17.15 - 18.45. [Register here](#)



22-23 June 2023

Advancing Data Technologies to Corner AMR 2023



(two half days; 13:30 - 17:30 CEST) UK participants have free access on 22 & 23 June: ask for the discount code! [Register here](#)

26 June 2023

Surface Chemistry for Antimicrobial Resistance: Innovations and Challenges. 10.30 - 16.00 Cardiff University. [Register here](#)

26 June 2023

Microbiology Seminar Series – 2.00-3.00 Penryn campus Exchange Green / Teams – all welcome! Email D.Walker-Sunderhauf@exeter.ac.uk for Teams link

28 June 2023

LSHTM Inaugural Lecture - Katharina Kranzer. Everything Everywhere All At Once: interdisciplinary research across multiple microbes. 17.15-18.15, [Zoom Link](#)

29 June 2023

MycoTalks: Agostinho Carvalho and Duncan Wilson, 16.00-17.00 [Register here.](#)

12-14 July 2023

The Microbiology Society: Anaerobe 2023. [Register here.](#)

**Microbes & Society Symposium
2023 Challenges:**

**Food | Planetary Health
Pathogens | The Microbiome**

17 - 18 July 2023, Penryn Campus

Register now!



17-18 July 2023

Microbes & Society Symposium

FREE EVENT. Penryn campus, transport & overnight accommodation included, [register here](#)

24-25 July 2023

The Microbiology Society: Early Career Microbiologists Forum Summer Conference. Bristol. [Register here](#)

27 July 2023

Mycotalks: Darius Armstrong-Jones and Aaron Mitchell. [Register here](#)

Further ahead

12 September 2023

Microbiology Society Microbial Genomics Roadshow. Selwyn College, Cambridge. [Register here.](#)

16 - 20 October 2023

Conférences Jacques Monod. A Matter of Scale: Within-host and between-host processes driving coevolution with parasites. Roscoff (France). [Register here](#) (abstract submission essential).

14-16 November 2023

ADR Conference. Public data for resilience and inclusion. [More information](#)

Funding calls

Large funding opportunities

EFSA - GP/EFSA/PLANTS/2023/01: Entrusting support tasks in the area of Plant Health Risk Assessment - Risk Assessment related to High Risk Plants and other Agricultural plants. Closing date 29 June. Award max €1 million. [More info](#)

EFSA - GP/EFSA/PLANTS/2023/06: Experimental and observational evidence to reduce knowledge gaps for risk assessment of new and emerging plant pests. Award max €500,000. Closing date 30 June. [More info](#)

BBSRC - India-UK partnership to address farmed animal diseases and health. Closing date 11 July. Award max £1 million. [More info](#)

ESRC - ACCESS Flex Fund Round 1. Grants available for environmental social science work, with proposals lead by ECRs strongly encouraged. Up to £30,000 available. Closing date 23 June. [More info](#)

NIHR - Under-represented disciplines and specialisms highlight notice: Methodologists. Apply as the lead investigator of proposals

that focus on any subject area or topic within the RfPB remit, including but not limited to methods research. International Fellowships. Award max £500,000. Closing date 16 August. [More info](#)

UKRI - cross-research-council responsive mode pilot scheme: round 1. Funding for interdisciplinary ideas that transcend, combine or significantly span disciplines. Award range £20k-£1.2m. Closing date 20 July. [More info](#)

Royal Society - International exchanges scheme - standard programme. For scientists based in the UK who want to stimulate collaborations with leading scientists overseas through either a one-off visit or bilateral travel. Opens 2 August: closing date 27 September. [More info](#)

American Kennel Club Canine Health Foundation, Inc. Infection Disease and One Health Request for Proposals. Open to graduate and pre-doc students. Award max \$20,000. Closing date 20 July. [More info](#)

Smaller funding opportunities

British Mycological Society - Small Grants. These promote mycology research by supporting members of the society to travel to meetings, perform fieldwork or research projects, buy books or scientific equipment, and hire meeting rooms or attend forays. Closing date 20 July. £500 available. [More info](#)

Healthcare Infection Society - Career development bursary, up to £2,500 available. Closing date 1 September. [More info](#)

Wellcome Trust - course bursaries available for a number of Wellcome Trust training courses. Up to 50% of course fee covered. [More info](#)

International Society of Antimicrobial Chemotherapy - Project grants. Up to £20,000 to support antimicrobial research in low- to middle-income countries. Closing date 01 September 2023. [More info](#)

Microbiology Society - Conference grants: protein secretion at the host-pathogen interface. Up to £250 available to support

attendance at conference on 3/4 November in Belfast. Closing date 25 August. [More info](#)

*** Research Professional**

Set up email alerts to your specific requirements and interests so you receive only those relevant to you.

[Log in here!](#)



Publications

Corzo-Leon D. E., Uehling J. K., **Ballou E. R.** [Microbe of the month: Rhizopus arrhizus.](#) *Trends in Microbiology*

Penny J., Alves P. B. R., De-Silva Y., **Chen A. S., Djordevic S.,** Shrestha S., Babel M. [Analysis of potential nature-based solutions for the Mun River Basin, Thailand.](#) *Water Science and Technology*

Green C., Bilyanska A., Bradley M., Dinsdale J., Hutt L., Backhaus T., Boons F., Bott D., Collins C., Cornell S. E., Craig M., **Depledge M.,** Diderich B., Fuller R., Galloway T. S., Hutchison G. R., Ingrey N., Johnson A. C., Kupka R., Matthiessen P., Oliver R., Owen S., Owens S., Pickett J., Robinson S., Sims K., Smith P., Sumpter J. P., Tretsiakova-McNally S., Wang M., Welton T., Willis K. J., Lynch I. [A Horizon Scan to support Chemical Pollution related policymaking for sustainable and climate resilient economies.](#) *Environmental Toxicology and Chemistry*

Rutagamara V. P., Ileri P. M., Sibomana C., Omufwoko K. S., Martin S. H.,

Ffrench-Constant R. H., Eckardt W., Kaplin B. K., Smith D. A. S., Gordon I. [African Queens find mates when males are rare.](#) *Ecology and Evolution*

Murray A. K., Zhang L., Snape J., **Gaze W. H.** [Functional metagenomic libraries generated from anthropogenically impacted environments reveal importance of metabolic genes in biocide and antibiotic resistance.](#) *Current Research in Microbial Sciences*

Scheuplein N. J., Lohr T., **Vega M. V., Ankrett D.,** Seufert F., Kirchner L., **Harmer N. J.,** Holzgrabe U. [Fluorescent probe for the identification of potent inhibitors of the macrophage infectivity potentiator \(Mip\) protein of Burkholderia pseudomallei.](#) *SLAS Discovery*

Ekeng B. E., Itam-Eyo A. E., Osaigbovo I. I., **Warris A.,** Oladele R. O., Bongomin F., Denning D. W. [Gastrointestinal Histoplasmosis: A Descriptive Review, 2001-2021.](#) *Life (Basel)*

Baumbusch J., Pascale Blakey E., Kagan S. H., **Melendez-Torres G. J.,** Montayre J., Munsterman E., Omisore T. [Taking the bad news with the good: The climate crisis and care for older people.](#) *International Journal of Older People Nursing*

Lapinska U., Glover G., Kahveci Z., Irwin N. A. T., Milner D. S., Tourte M., Albers S-V., Santoro A. E., Richards T. A., **Pagliara S.** [Systematic comparison of unilamellar vesicles reveals that archaeal core lipid membranes are more permeable than bacterial membranes.](#) *PLoS Biology*

Ghiga I., **Pitchforth E.,** Stålsby Lundborg C., Machowska A. [Family doctors' roles and perceptions on antibiotic consumption and antibiotic resistance in Romania: a qualitative study.](#) *BMC Primary Care*

Vos, M. [Accessory Microbiomes.](#) *Microbiology*

Imrie R. M., Walsh S. K., Roberts K. E., Lello J., **Longdon B.** [Investigating the outcomes of virus coinfection within and across host species.](#) *PloS Pathogens*

Ghiga I., Sidorchuk A., **Pitchforth E.,** Stålsby Lundborg C., Machowska A. ['If you want to go far, go together'-community-based behaviour change interventions to improve antibiotic use: a systematic review of quantitative and qualitative evidence.](#) *Journal of Antimicrobial Chemotherapy*

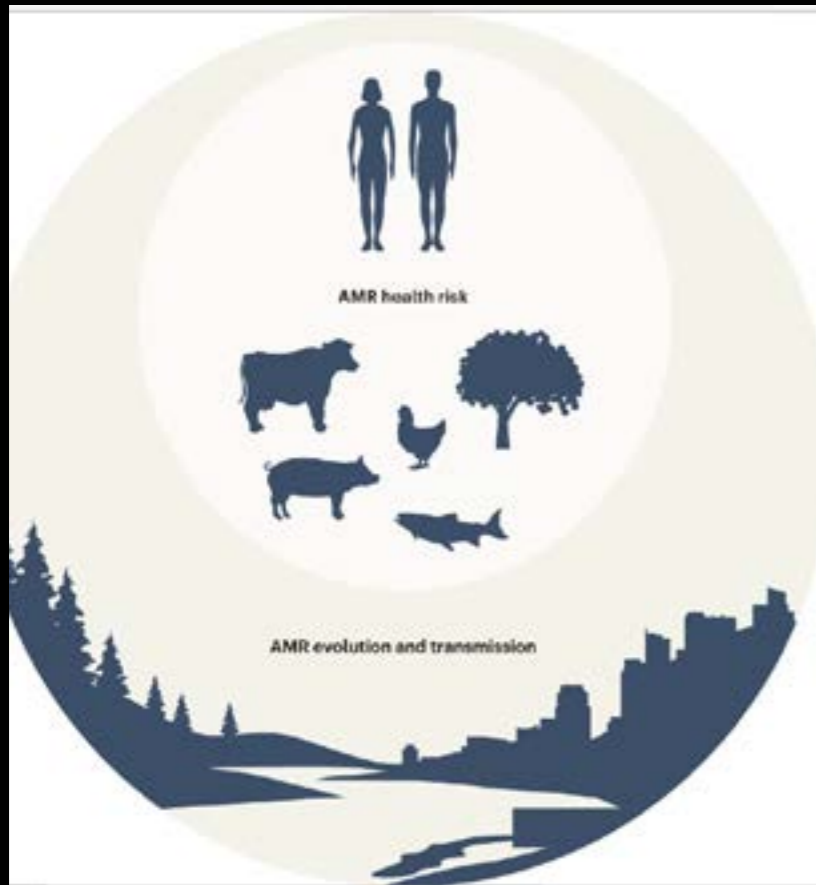
Dimitriu T., Souissi W., Morwool P., Darby A., Crickmore N., **Raymond B.** [Selecting for infectivity across metapopulations can increase virulence in the social microbe Bacillus thuringiensis.](#) *Evolutionary Applications*

Noell S. E., Hellweger F. L., **Temperton B.,** Giovannoni S. [A Reduction of Transcriptional Regulation in Aquatic Oligotrophic Microorganisms Enhances Fitness in Nutrient-Poor Environments.](#) *Microbiology and Molecular Biology Review*

Dambuza I. M., Warris A., Salazar F. [Unmasking a Fungal Fire.](#) *PLoS Pathogens*

Publication Spotlight

AMR, One Health and the environment (Larsson et al., 2023)



This correspondence piece, co-authored by Professor Will Gaze and published in *Nature Microbiology*, seeks to address potential connotations around the framing of One Health, and how AMR relates to each of the One Health compartments.

Will explains, “The classical view of One Health is of three overlapping compartments,

human, animal and environmental; sometimes referred to as human, animal and environmental health. We argue that this can result in a perception that the animal and environmental compartments do not relate to human health, which can disincentivise action by those primarily focused on human health. We suggest that humans and animals should be nested within the environment, which in the case of AMR is particularly pertinent because the environment represents a huge reservoir of resistance genes that evolved over evolutionary time and that are now emerging in clinical pathogens. That is not to say that antimicrobials do not impact environmental ecosystem function, rather that the majority of research on the environmental dimension of AMR seeks to improve understanding of AMR evolution and transmission that contributes to AMR infections in humans rather than focusing on impacts on the environment per se.”

Zhang B., Phetsang W., Stone M. R. L., Kc S., Butler M. S. Cooper M. A., Elliott A. G., **Lapinska U., Voliotis M., Tsaneva-Atanasova K., Pagliara S.**, Blaskovich M. A. T. [Synthesis of vancomycin fluorescent probes that retain antimicrobial activity, identify Gram-positive bacteria, and detect Gram-negative outer membrane damage.](#) *Communications Biology*

Larsson D. G. J., **Gaze W. H.**, Laxminarayan R., Topp E. [AMR, One Health and the environment.](#) *Nature Microbiology*

Alathari S., Chaput D. L., Bolaños L. M., Joseph A., Jackson V. L. N., Verner-Jeffreys D., Paley R., Tyler C. R., Temperton B. [A Multiplexed, Tiled PCR Method for Rapid Whole-Genome Sequencing of Infectious Spleen and Kidney Necrosis Virus \(ISKNV\) in Tilapiae.](#) *Viruses*

John L. L. H., Thomson D. D., Bicanic T., Hoenigl M., Brown A. J. P., Harrison T. S., Bignell E. M. [Heightened Efficacy of Anidulafungin When Used in Combination with Manogepix or 5-Flucytosine against *Candida auris* In Vitro](#) *Antimicrobial Agents and Chemotherapy*

Butler J., Handy R. D., Upton M., Besinis A. [Review of Antimicrobial Nanocoatings in Medicine and Dentistry: Mechanisms of Action, Biocompatibility Performance, Safety, and Benefits Compared to Antibiotics.](#) *ACS Nano*.

Butler J., Upton M. [What's really down the hospital plughole?](#) *Journal of Hospital Infection*.

Williams J., Severin J., Temperton B., Mitchelmore P. J. [Phage Therapy Administration Route, Regimen, and Need for Supplementary Antibiotics in Patients with Chronic Suppurative Lung Disease.](#) *Phage (New Rochelle)*

Moggioli G., Panossian B., Sun Y., **Thiel D.**, Martín-Zamora F. M., Tran M., Clifford A. M., Goffredi S. K., Rinskaya-Korsakova N. K., **Jékely G.**, Tresguerres M., Qian P-Y., Qiu J-W., Rouse G. W., Henry L.M., Martín-Durán J. M. [Distinct genomic routes underlie transitions to specialised symbiotic lifestyles in deep-sea annelid worms.](#) *Nature Communications*

Walker-Sunderhauf D., Klumper U., Pursey E., Westra E. R., Gaze W. H., van Houte S. [Removal of AMR plasmids using a mobile, broad host-range CRISPR-Cas9 delivery tool.](#) *Microbiology (Reading)*

Farrell M. F., Chueiri A., O'Connor L., Duane S., Maguire M., Miliotis G., Cormican M., Hooban B., **Leonard A., Gaze W. H.**, Devane G., Tuohy A., Burke L. P., Morris D. [Assessing the impact of recreational water use on carriage of antimicrobial resistant organisms.](#) *The Science of the Total Environment*

Stukenbrock E., **Gurr S.** [Address the growing urgency of fungal disease in crops.](#) *Nature*

Publications contd

Louis M., Tahrioui A., Lendon C. J., Clamens T., Leprince J., Lefranc B., Kipnis E., Grandjean T., Bouffartigues E., Barreau M., Defontaine F., Cornelis P., Feuilloley M. G. J., **Harmer N. J.**, Chevalier S., Lesouhaitier O.

[The natriuretic peptide receptor agonist osteocrin disperses Pseudomonas aeruginosa biofilm](#). *Biofilm*

Castledine M., Newbury A., Lewis R., Hacker C., Meaden S., Buckling A. (2023). [Antagonistic Mobile Genetic Elements Can Counteract Each Other's Effects on Microbial Community Composition](#). *Mbio*

Shaw L., Nunns M., Briscoe S., **Garside R.**, Turner M., **Melendez-Torres G. J.**, Lawal H. M., Thompson Coon J. [Optimising the prescribing of drugs that may cause dependency: An evidence and gap map of systematic reviews](#). *Journal of Health Services Research & Policy*.

Bard A. M., **Hinchliffe S., Chan K. W., Buller H.**, Reyher K. K. ['I Believe What I'm Saying More Than the Test': The Complicated Place of Rapid, Point-of-Care Tests in Veterinary Diagnostic Practice](#). *Antibiotics*

Sweetapple C., Wade M. J., **Melville-Shreeve P., Chen A. S.**, Lilley C., Irving J., Grimsley J. M. S., Bunce J. T. [Dynamic population normalisation in wastewater-based epidemiology for improved understanding of the SARS-CoV-2 prevalence: a multi-site study](#). *Journal of Water and Health*

Walsh, S. K., Imrie, R. M., Matuszewska, Paterson G. K., Weinert L.A., Hadfield J. D., Bucking A., Longdon B. [The host phylogeny determines viral infectivity and replication across Staphylococcus host species](#). *PLoS Pathogens*

Publication Spotlight

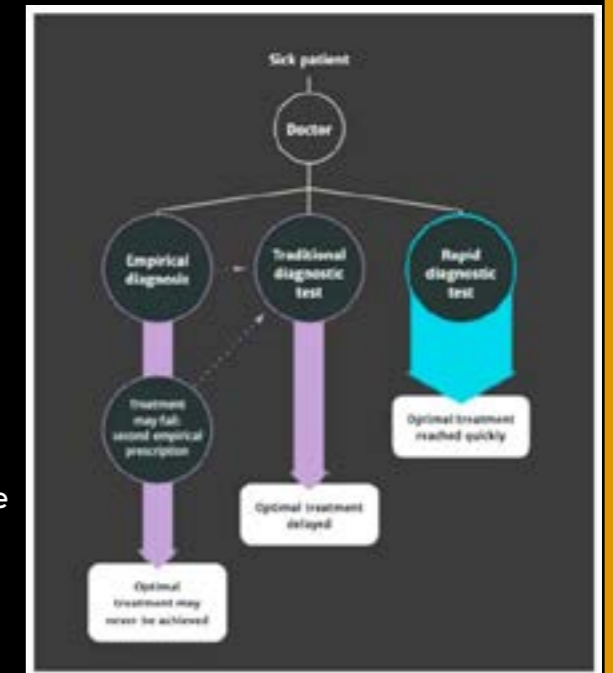
I Believe What I'm Saying More Than the Test': The Complicated Place of Rapid, Point-of-Care Tests in Veterinary Diagnostic Practice (Bard et al., 2023)

In the 2016 O'Neill report, entitled Tackling Drug Resistant Infections Globally: Final Report and Recommendations. The Review on Antimicrobial Resistance, a strong case was made for more effective and efficient diagnostic processes as a means to reduce unnecessary or inappropriate antibiotic uses. In place of empirical diagnoses (the process of treating first and asking questions later), it urged innovation and adoption of smarter, more precise, forms of making sure that treatments were only used when and where susceptible bacteria had been identified as present.

Laboratory-based tests were of course often available, but subject to sometimes long delays which could result in failure to treat in a timely manner. Delays in treatment could be costly – valuable livestock like dairy or beef cattle may not recover if treatment is withheld, while the broiler industry only has 35 days to take a bird to market weight in environments that are conducive to disease transmission. Even a few days can result in a shed of 40,000 birds becoming infected and for the farmer to lose a crop.

In the animal health sector, rapid pen-side tests would seemingly solve the problem of timely pathogen identification. And yet, in this research, which was part of a larger project looking at the diagnostics innovation ecosystem within livestock industries (DIAL <https://www.dialamr.com/>) the problem was not as clear cut as O'Neill imagined.

The study uses participatory, deliberative events with veterinarians to understand the conditions for use of diagnostic testing. The qualitative data and its analysis demonstrate that veterinarians (i) were driven by both medical and non-medical motivators for using tests; (ii) had a complex professional identity influencing diagnostic-test engagement; and (iii) balanced a multitude of situated contextual factors that informed "gut feelings" on test choice and interpretation of results. The implication was that tests have a supportive rather than definitive role to play in animal health, and that veterinarians were keener to pursue more general improvements in animal health, including data led approaches, than to rely on the spurious accuracy of rapid tests. The result was a less than favourable environment for innovation, adoption of technology, but one that may suggest more informed ways for reducing resistance risks in farming.



O'Neill's proposed pathway for how new rapid diagnostic testing would optimise treatment.