# Stop AMR Global Media Monitor

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## Cheap diagnostic test brings the fight against AMR to the field

Many doctors usually prescribe antibiotics without first testing how susceptible the infection is, because standard tests require cultivation of the bacteria that can take days. In recent years, novel molecular techniques have emerged that speed up the process by analysing bacterial genes to identify resistant-inducing ones, but these are expensive and require training.

To solve this, scientists at the University of Cambridge are developing a simple, cheap and portable AMR diagnostic kit. Integrated into a small briefcase with a solar-panelled battery, it could be used anywhere in the world, from hospitals to remote areas, and unlike conventional testing it can determine the sample's resistance profile without needing to identify the pathogen. The kit will also have highly customisable probes, as resistant genes vary drastically between countries and even between hospitals. Interestingly, a phone app will also be available to share the data with the relevant centralised surveillance systems which track the spread of AMR.

Source: TheConversation, 4 August 2020

## Are drug-resistant bacteria the next pandemic?

The COVID-19 pandemic has demonstrated society can no longer afford to neglect health issues known to have disastrous consequences; namely, AMR. In this article, biochemist and entrepreneur Louis Metzger IV provides some background on this brewing crisis, with an exploration of how bacteria developed resistance mechanisms and delves into the pharmaceutical industry's dwindling antibiotic production caused by the decreased potential for profit.

The article calls for increased action by pharmaceutical companies and more governmental incentives. But most importantly, it ends with the interesting suggestion of an academic-pharmaceutical collaboration, overseen by the government, that addresses the threat posed by infectious diseases such as antibiotic-resistant bacteria with the "*funds and priority equivalent to those devoted to World War II's Manhattan Project*."

Source: Forbes, 4 August 2020

## New technology prevents spread of bacteria across metal surfaces

Researchers at Purdue University have developed a treatment that infuses hardened metal surfaces with naturally occurring antimicrobial peptides, which kills any bacteria that try to attach to them.

Professor and team leader David Bahr explains the technology as follows: "*When we create an oxidized metal surface with nanometer-wide and micrometer-deep cracks, peptides can be infused in these microscopic cracks with a simple wet process. As an additional benefit, the process can color several metals, providing a visual indication of when the surface is no longer antimicrobial*."

This development could particularly benefit the food processing industry, where cross contamination to cutting surfaces would be prevented and therefore avoid contaminating any further products. Together with standard food washing and safe handling practices, it should reduce the number of foodborne illnesses outbreaks.

Source: Purdue University, 28 July 2020

## Rapid diagnostic for gonorrhoea wins $19 million federal prize competition to combat AMR

Antimicrobial resistance in gonorrhoea is of increasing concern, and successful treatment of gonorrhoea is becoming more difficult. A diagnostic test capable of accurately and reliably detecting the microorganism that causes gonorrhoea and rapidly determining in under 30 minutes if the microorganism is susceptible to a single-dose antibiotic is the winner of the Antimicrobial Resistance (AMR) Diagnostic Challenge.

This type of rapid testing that includes assessment of antibiotic susceptibility has not been available previously as a point-of-care diagnostic device and shows an effective way allowing clinicians to treat patients immediately.

"Antibiotic-resistant bacteria are a growing and concerning public health risk against which we have few effective deterrents," said NIH Director Francis S. Collins, M.D., Ph.D. If approved by the U.S. Food and Drug Administration, this diagnostic device could be useful in ensuring that patients with gonorrhoea receive the right antibiotic so that they can immediately begin treatment.

National Institute of Health August 5, 2020

## Why New Antifungals are Desperately Needed

Antibiotic resistance has deservedly garnered most headlines, but resistance to antifungals is yet another facet of this growing medical threat which should not be overlooked. Despite fungi having a lower mutation rate than bacteria and not being able to spread those mutations as readily, antifungal resistance has been slowly but steadily increasing over the past few decades, driven particularly by widespread use of these chemicals in agriculture. Consequently, resistance rates currently hover around 5-10%.

This menace is further exacerbated by the fact that at present there are only 3 main classes of antifungal drugs on the market. As Marco Taglietti, CEO of US-based antifungal biotech Scynexis, stated "*There are so few antifungals available that when you start to have a class that has become resistant you suddenly lose half of your weapons*". Experts thus call for increased awareness and investment into this field, but praise that 4 new drugs are already in advanced stages of clinical development.

Source: Labiotech.eu, 29 July 2020

## New peptide can make resistant bacteria sensitive

Scientists at the NTU Singapore have developed an antimicrobial peptide that in their experiments killed over 90 percent of bacteria strains and rendered bacteria more susceptible to antibiotics. The peptide was even found to kill bacteria in biofilms, which are notoriously difficult for traditional antibiotics to penetrate.

CSM5-K5, as the chemical has been called, is partly made of repeating units of chitosan, a sugar found in crustacean shells that has a similar structure to the bacterial cell wall. This physical similarity allows it to interact with the cell wall, leading to defects in it that eventually kill the bacteria.

Prof Mary Chan, director of NTU's Centre of Antimicrobial Bioengineering, said: "*While efforts are focussed on dealing with the COVID-19 pandemic, we should also remember that antibiotic resistance continues to be a growing problem [...]. For instance, viral respiratory infections could allow bacteria to enter the lungs more easily, leading to bacterial pneumonia, which is commonly associated with COVID-19.*"

Source: Techexplorist, NTU Singapore, 6 August 2020

## High-resolution imaging uncovers how phages kill

Researchers have discovered how phages can attack and kill Salmonella Typhi (responsible for typhoid) through high-resolution imaging. They saw an outstanding choreography by the phages as they assembled the main components of their particles, namely a head filled with viral DNA and a tail used to infect the bacteria.

This discovery could provide scientists with a new understanding of how they can be used against AMR, and could also "*help move phage therapies from compassionate use, where all other treatment options have been exhausted, to more widespread clinical use*".

Source: ScienceDaily, 30 July 2020