



Stop AMR

Global Media Monitor

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China and UK Join Forces to Address AMR

The United Kingdom is collaborating with China on developing new treatments to combat AMR by looking into traditional Chinese medicine. The aim is to develop alternative treatments to antibiotic to treat farm animals.

The company Oxford Drug Design received a 800,000 pound investment from the UK's Department of Health and Social care, which was completed by an additional 1.4 million pound from other investors. This will be used in collaboration with two partners in China, Huazhong Agricultural University and Wuhan HVSEN Biotechnology, and one in the UK, the University of Portsmouth, towards two goals.

One of the goals is to design a new drug that will specifically target bacterial pathogens that cause infections in pigs. This antibiotic would be a "narrow spectrum agent" targeting pig pathogens but not human ones, thereby reducing the potential harm if the bacteria were to develop resistance. The drug will target bacterial protein sensors that detect environmental changes and allow the bacteria to adapt to its surrounding. Disrupting these mechanisms would decrease the fitness of the bacteria in the environment and potentially also reduce its virulence.

The second aim is to test the potential applications of traditional Chinese Medicine (TCM) for the treatment of pigs. The focus would be to find applications of TCM to serve as growth promoters in swine in the place of antibiotics. At the moment, the work is focused on identifying and understanding the active compounds of TCMS to see if they could be potential starting points for further drug development.

Source: ECNS, 08 November 2019

On the trail of pathogens in meat, eggs and raw milk

The German Federal Institute for Risk Assessment (BfR), a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) has developed a tool to track food born disease outbreaks, such as Listeria. "The FoodChain-Lab software allows us to track products from the manufacturer to the epicentre of cases of illness," says BfR President Professor Dr. Dr. Andreas Hensel. "We supply our innovative software to interested users worldwide."

The software works by comparing genetic profiles of pathogens with the delivery dates of the food in question and this enables it to determine the source of contamination.

Source: EurekAlert! 06 November 2019

Report Shows Drug-Resistant Infections Climbing in England

Despite an overall decline in antibiotic use (9%), the latest English Surveillance Program for Antimicrobial Utilisation and Resistance (ESPAUR) report by Public Health England (PHE) has shown a 9% increase in antibiotic resistant infections with an estimated 60,788 antibiotic resistant infections in England in 2018 as opposed to 55,812 in 2017. Furthermore, there were 15,000 more occurrences of bloodstream infection by seven priority bacterial pathogens in 2018 compared to 2014, with a 32% increase of resistant ones. Two particular antibiotic-resistant bacteria that saw a significant increase in occurrence were ciprofloxacin and third-generation cephalosporins resistant E. coli and Klebsiella pneumonia.



The decline in antibiotic use can be attributed to a 16.7% drop in primary care and a 25% drop in dental antibiotic prescriptions, while use in hospital increased by 2.8%.

Despite the Keep Antibiotics Working campaign having shown success, with a decrease in consumption, there has still been an increase in AMR. Thus, the PHE has elected to relaunch the public awareness campaign: "Antibiotic resistance is not just a matter for clinicians—the public also have a crucial role to play in helping to preserve these vital medicines," (PHE chief medical officer Chris Whitty, CB, DSc). This campaign was a key element of the UK's 5-year National Action Plan that began in 2013. For its second 5-year plan (2019-2025) the UK is aiming to reduce antibiotic resistant infections by 10% by 2025 with a decrease of 15% in antibiotic use.

Source: CIDRAP, 04 November 2019

Study Backs Use of Aminoglycosides for ESBL Bloodstream Infections

A potential treatment solution for bloodstream infections of urinary source caused by extended-spectrum beta-lactamase-producing Enterobacteriaceae (ESBL-EB) could be the use of aminoglycosides. Israeli researchers tested three different antibiotics (aminoglycosides, carbapenems or piperacillin-tazobactam) on patients showing positive blood and urine culture for ESBL-EB and found that aminoglycosides did not underperform compared to the other two regarding both 30-day mortality and when dealing with patients without severe sepsis or septic shock. On the other hand, they did not perform as well when dealing with bacteriuria recurrence.

The conclusion of the authors is that "this approach supports avoiding excessive use of carbapenems without compromising efficacy and safety of treatment."

Source: Journal of Antimicrobial Chemotherapy, 06 November 2019

Reports Gives Fast Food Chains Low Grades on Antibiotics in Beef

Most of the US's major restaurant chains have been given a failing grade regarding their beef sourcing. This concerns the use of antibiotics in the beef production. These grades were handed out by the fifth annual Chain Reaction report (produced by the Public Interest Research Groups, the Natural Resources Defense Council, Consumer Reports, Center for Food Safety, Food Animal Concerns Trust, and the Antibiotic Resistance Action Center), that explores the policies and practices of the 25 US top restaurant chains regarding antibiotic use in their meat. Chipotle and Panera were the only two that had responsible antibiotic policies, which earned them an 'A' grade. On the other hand, an 'F' grade was given to fifteen chains due to them not having any policy geared towards sourcing beef not grown with antibiotics.

This apparent lack of effective policies concerning beef sourcing in relation to antibiotics is in stark contrast with the effective actions undertaken by the same chains when dealing with antibiotics in poultry, where 13 out of the 25 now have responsible policies and 4 are in the process of finalizing them. These policies mainly target the non-use of antibiotics as growth promoters.

Source: CIDRAP, 01 November 2019

Older Adults Concerned About Antibiotics Overuse - Until They Get Sick

A US national survey has found that whilst most older Americans know about and consider resistance to antibiotic to be a serious issue (82%) and that 56% believe antibiotics are overprescribed by Doctors, 41% were still expecting to receive some in the event of long lasting cold or flu, despite these most often having a viral origin. Furthermore, 13% reported having leftover antibiotics, with 60% stating it was for future infections.

For Poll director Preeti Malani, MD, chief health officer at the University of Michigan, these results indicate that there is a need for healthcare professionals to continue educating the public to ensure "older adults understand safe and appropriate use of these medications so that we



can preserve the effectiveness of antibiotics for patients who need them most”.

Source: CIDRAP, 05 November 2019

Hospitals Disinfectants Struggling to Kill C. diff Bacteria Colonies

Clostridioides difficile (C. diff) is notorious for being hard to kill due to a number of acquired resistances to antibiotics. Furthermore, this potentially deadly bacteria is also difficult to get rid of when using hospital-grade disinfectants as proven by a study of the University of Houston. Kevin, Garey, professor of pharmacy practice at the University of Houston and chair of the College of Pharmacy Department of Pharmacy Practice and Translational Research, stated that they had found that “no disinfectant was able to completely eliminate C. difficile embedded within biofilms, although we did note differences among disinfectants”.

Bacteria have the potential to grow on almost any surface and form complex biofilms that act as a “suit of armour” (Garey) and in the case of C. diff this biofilm arrangement provides a zone in its centre with no oxygen that is essential for its anaerobic spores to survive.

The findings showed that overall, the most effective disinfectants were Clorox, Cidex OPA and Virex were the most effective at killing C. diff spores with the former two also being effective against vegetative cell growth (cellular stage responsible for causing infections).

Source: EurekAlert! 06 November 2019

Scientists Discover How Potent Bacterial Toxin Kills MRSA Bacteria

The lysostaphin enzyme was discovered over 50 years ago and has been used since then either alone or in combination with antibiotics to treat Staphylococcal infections, including methicillin-resistant S. aureus (MRSA). However, not much was known about its mechanisms of action. A study by the University of Sheffield has discovered how this potent bacterial toxin is able to target MRSA and kill it. This is done through its ability to increase the number of its molecules bound to

the MRSA cell wall surface, which effectively allows it to ‘walk’ on the membrane and break it down.

This discovery has high potential in the fight against AMR as it provides an alternative to dealing antibiotic resistant Staphylococcal infections.

Source: EurekAlert! 04 November 2019

Solution of the High-Resolution Crystal Structure of Stress Proteins From Staphylococcus

Staphylococcus aureus is one of the most dangerous bacteria for humans due to its high virulence and antibiotic resistance. As of now, there are no antibiotics that specifically target Staphylococcus, and this gap needs to be addressed.

A potential target of the specific antibiotic could be the ribosomes. As explained by the Project leader Head of Structural Biology Lab Konstantin Usachev, "One of the main factors favouring a microorganism's survival in extreme conditions is preserving ribosomes - a macromolecular complex comprising RNA and proteins. For this purpose, a cell synthesizes special proteins which may stop translating ribosomes until the stress is over. One of such proteins is hibernation promoting factor (HPF) which transfers ribosomes to the 'hibernation state'." The team managed to provide the first X-ray high-resolution analysis of the HPF domain from Staphylococcus aureus, which “regulates the dimerization of ribosomes and keeps [them] in their ‘hibernation state’”. This allowed them to find five single amino acid residues essential for the proper function of this protein. Finding compounds that could bind to these protein areas could potentially “decrease the vitality of Staphylococcus aureus under stress” (Dr. Usachev).

Source: EurekAlert! 06 November 2019