Stop AMR Global Media Monitor

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Now metal surfaces can be instant bacteria killers

A key problem when dealing with pathogenic bacteria is that they can survive on surfaces for several days and this increases the risk of spreading infections. How could reduce this timeframe and ensure that any bacteria that encounter surfaces such as tables or doorknobs in hospitals for example, die quickly. This would be crucial for resistant bacteria in particular. This is the goal that researchers at Purdue University set for themselves and they succeeded.

The solution they found was to use the bactericide properties of copper. One issue with copper is that despite having been "as an antimicrobial material for centuries. […] it typically takes hours for native copper surfaces to kill off bacteria," as per Rahim Rahimi, a Purdue assistant professor of materials engineering. With flat copper surfaces, there is not sufficient contact between the bacteria and the metal, and the point of contact is spread out. By using a "one-step laser-texturing technique", the team managed to "effectively enhances the bacteria-killing properties of copper's surface." The resulting copper surface is rugged and therefore increases the contact area with the bacteria as well as can more easily lead to immediate rupture of the bacteria once it meets the copper.

Source: EurekAlert!, 09 April 2020

NHS could save £89 million and further fight against antimicrobial resistance

A new comprehensive UK study has highlighted that its national healthcare system, the NHS, could save up to £89 million and tackle the rise of AMR if the point-of-care (POTCS) diagnostic tests where introduced. These already and already available and can detect protein biomarkers specific for viral or bacterial infections that cause respiratory infections with up to 80-90% accuracy. Being able to differentiate between the two types of infections will be crucial in reducing the volume of antibiotics that are wrongly prescribed for viral infections.

So far, despite many health practitioners having been shown to be in favor (at least 50-60% of surveyed), high costs have prevented their adoption. However, the study highlights that in the event of respiratory infections, antibiotics are prescribed for around 50% of cases despite bacteria being the source only around 9% of the time. This translates to roughly £326 million in unnecessary antibiotic use per year (includes the direct and indirect costs). If you factor in the costs of POCTs and the costs of treating the diagnosed infection, which range between £148 million and £290 million depending on the POCT, the NHS could save up to £89 million per year.

Source: EurekAlert!; 7 April 2020

A new antiviral drug heading into clinical trials offers hope for COVID-19 treatment

A new drug, called EIDD-2801, shows promising results on mice. The lung damages induced by COVID-19 were significantly reduced. When used as a prophylactic treatment, the antiviral drug manages to prevent severe lung injury. When administrated in the 24 h period following the infection, the severity of the infection and the weight loss was statistically reduced. As mice are more sensitive than human to the virus, window of opportunity is expected to be longer in humans. The drug will soon move to human clinical trials.
Source: EurekAlert!, 06 April 2020

One of the mechanisms of Staphylococcus antibiotic resistance deciphered

The new published paper, fruit of an international collaboration, tackles the issue of stress resistance in Staphylococcus aureus and could promote the finding of new antibiotics.

They manage to fully describe the structure of ribosomes and compared it to other ribosome's organisms.

Ribosomes are composed of two subunits, a small and a large one. The small one reads the genetic code and the large one is to ensure the formation of peptide bonds in the growing protein chain.

They discovered that under stress conditions, the ribosomes of Staphylococcus aureus were affected and started to become unfunctional, protecting the bacteria.

To focus ribosomes and specific discovered receptors could help, with a transverse approach, development of new medications.

Source: EurekAlert!, 07 April 2020

Scientists provide new insight on how bacteria share drug resistance genes

A new published study in eLife highlights the mechanism behind shared drug resistance genes.

This mechanism, also known as horizontal gene transfer, is the capability of bacteria to transmit mobile genetic elements between them. It allows some genetic mutations, such as antibiotic resistance to quickly spread inside the population and could lead to so-called superbugs, multiple or totally resistant bacteria. Such bacteria are an increasing threat in hospitals and could lead to severe and mortal infections in patients.

To investigate how to stop bacteria from sharing drug resistance genes, researchers screened more than 2000 bacteria gathered in a single hospital over the course of one and half year. They started to identify all the possible mobile genetic elements and manage to determine the ones capable of being shared among hospital bacteria.

They discovered that a single plasmid, containing code for multidrug resistance, was transferred, certainly by horizontal transfer, between bacteria infecting two separate patients.

To identify and study the most mobile components could "give us the opportunity to design new strategies to prevent and control multidrug resistant bacterial infections in patients" says one of the authors.

Source: EurekAlert!, 14 April 2020

Influenza: researchers show that new treatment reduces spread of virus

A study led on ferrets was published in PLoS Pathogens. Ferrets, known as the standard model to study and evaluate influenza, were used to test a newly developed antiviral drug, baloxavir. It is the first new licensed molecule in nearly 20 years. Baloxevir was compared to a commonly prescribed molecule, oseltamivir. Baloxevir shows better results as it efficiently reduces transmission of influenza to other ferrets (direct and indirect transmission) while at the same time, reducing the length of influenza illness in treated ferrets.

It is a significant breakthrough as previously used drug, oseltamivir, did not reduce spread effectiveness of influenza, forcing unaffected members of a family to take antivirals if they did not want to be infected.

A trial has started in human and this discovery could be a game changer amongst the most vulnerable groups.

Source: EurekAlert!, 16 April 2020