



Department of Botany and Microbiology,
St. Aloysius College (Autonomous), Jabalpur
Reaccredited A+ By NAAC With CGPA 3.68/4.0
College With Potential For Excellence by UGC
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TRENDS IN MICROBIOLOGY

January - March 2024



Drug Shows Clearing HIV from Brain

Brain related issues caused by HIV, still affect people even when they are on effective HIV medication. Antiretroviral therapy (ART) is an essential component of successful HIV treatment. However, ART does not completely eradicate HIV, necessitating lifelong treatment. Eradicating the virus from the brain is critical for comprehensive HIV treatment and could significantly improve the quality of life for those with HIV related neurocognitive problems. By using a small molecule inhibitor (BLZ945) to block a receptor that increases in HIV-infected macrophages. The viral load in the brain is successfully reduced. This approach provided a potential new treatment avenue for HIV.

In addition, treatment did not significantly impact microglia, the brain's resident immune cells and it also did not show signs of liver toxicity at the doses tested.

Nanopore Sequencing A New Clinical Practice

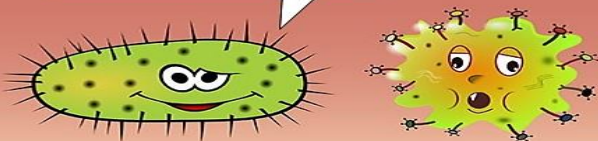
A new species of bacteria, named *Variovorax durovernensis*, is discovered as a source of a patient's blood infection after the patient, who works as a shepherd in Canterbury, presented with fever, a standard blood test discovered two different species of bacteria as the source of infection. However, one of the species could not be identified with conventional laboratory testing.

To characterise the species, the researchers used a nanopore sequencer.

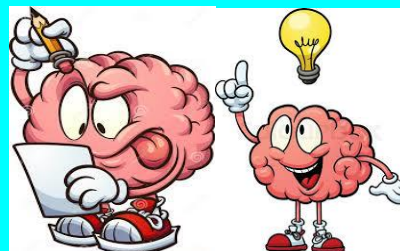
The results, showed that it was a new species of *Variovorax*, a group of bacteria that lives in the soil. Alongside the new discovery, highlights the effectiveness of nanopore sequencing for clinical practice. The process is fast and user-friendly and the equipment can be provided directly to hospitals, instead of the more time-consuming process.

OH! ANTIBIOTIC ATTACKED ME, I AM DYING.

DON'T BE SAD. PEOPLE NEVER COMPLETE THEIR ANTIBIOTIC COURSE. YOU WILL BE LIKE BEFORE.



“The human microbiome weighs about 1.5 kg (3.3 lbs), which is equivalent to the weight of a human brain”.



Zosurabalpin: A New Antibiotic Chemical Class

Zosurabalpin is a new class of antibiotic which has been found to have potent activity against carbapenem-resistant *Acinetobacter baumannii* (CRAB) and works by blocking the transport of lipopolysaccharide. CRAB is a major global pathogen and is rated a priority one pathogen by the World Health Organization, alongside Multidrug-Resistant Bacteria and poses threat in hospitals, nursing homes and among vulnerable patients. These pathogens can cause severe and even deadly infections. It has been over 50 years since a new antibiotic chemical class with activity against *A. baumannii* was approved.

The researchers found that zosurabalpin could treat highly drug-resistant Crab both in vitro and in multiple mouse infection models, including sepsis.

The researchers said the findings demonstrate the potential of zosurabalpin as an antibiotic and it has now been evaluated in two phase I clinical trials.

Blocking Nutrient Inhibits Malaria Parasite Growth

Preventing malaria parasite from scavenging fatty acids, a type of required nutrient, it could no longer grow. It was found that two enzymes were instrumental in breaking down host lipids to release the fatty acids, these enzymes work in different places: One works outside in the red blood cell and the other works inside the parasite. When both enzymes were stopped from working, either by changing the parasite's genes or by using drugs, the parasites couldn't grow in human blood.

Bacteria's Role in Chronic Bone Infection After Joint Surgery

In individuals who have undergone knee or hip replacement surgery, clinicians are noticing increasing numbers of chronic bone infections linked to a bacterial strain commonly found on the skin.

Utilizing mouse models of bone infection and systematic electron microscopy studies, it was found that the common skin bacteria *Cutibacterium acnes* can persist as layers of biofilms for weeks on contaminated titanium or stainless-steel implants. It can also invade deep pockets of the bone called canalicular networks and be present within the bone for long periods of time.

Respiratory bacteria turn off immune system to survive

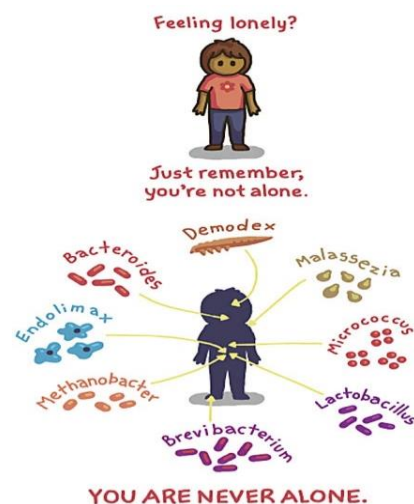
Haemophilus influenzae, a bacterium that plays a significant role in worsening respiratory tract infections by essentially turning off the body's immune responses, by very limited production of inflammation molecules over time, which normally would be produced. Therefore, inducing a state of tolerance in human respiratory tissues.

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Departmental Activities

Ecofest (13/01/24)



Internship: Applied Techniques in Botany (12/2/24)



Science Day Celebration (26-28/02/24)

