

Researchers decode how HIV infection raises TB risk

The HIV virus increases the potency of the tuberculosis bacterium by affecting a central function of the immune system, a new study has found. The discovery by researchers at Linköping University in Sweden helps to explain why infection with HIV greatly increases the risk that infection by tuberculosis bacterium (Mtb) will progress to active tuberculosis.

In most people who are exposed to tuberculosis infection, the immune defence deals with the bacteria by enclosing them in a special scar tissue. In this condition the tuberculosis is said to be "latent". Around 10 per cent of those with latent tuberculosis will go on to develop active disease. We know that infection with HIV is the greatest risk factor for the development of active

tuberculosis after infection with Mtb.

"The risk of infection progressing to active tuberculosis is around 30 times higher for people who are HIV-positive. But the reason for this has not been known at the cellular level," said senior lecturer Robert Blomgran, who led the study. In the new study, the researchers looked in more detail at what happens in one particular type of immune cell, known as dendritic cells. These play an important role in the immune defence. Dendritic cells break down tuberculosis bacteria and other foreign microorganisms, and display the bacteria fragments at the cell surface. Other cells of the im-

mune system, in particular T-cells, recognise the fragments and bind to them.

The dendritic cell then activates the T-cell such that it can kill the tuberculosis bacteria efficiently. In this way, dendritic cells act as a communication link between the innate immune defence and the specific immune defence, of which the T-cells are part.

The researchers infected human dendritic cells with both Mtb and the HIV virus. They showed that co-infection reduced the ability of the dendritic cells to present foreign molecules to

the immune defence. They also had a lower capacity to activate tuberculosis-specific T-cells than was the case when the dendritic cells were infected with Mtb alone.

"We have now shown that HIV has a clear effect also on the innate immune defence, in particular the dendritic cells, which link the innate and the adaptive immune defences.

"We can already suggest that one important future treatment strategy for infection should be to find ways to strengthen or boost cells in the immune defence using what is known as 'host-directed therapy'," said Blomgran.

According to the World Health Organisation (WHO), around 9.6 million people around the world develop tuberculosis each year, researchers said. (PTI)



Pancreatic cancer increasing, awareness low: Study

While the incidence of pancreatic cancer is increasing, awareness about the disease remains relatively low, experts said at a conference here on gastroenterology, media reported.

The United European Gastroenterology (UEG) Week conference on Tuesday noted that about 100,000 people in Europe are expected to have pancreatic cancer in the coming year, overtaking the population with breast cancer, which is estimated to stand around 90,000. Xinhua news agency reported. However, the outlook for pancreatic cancer patients has not improved noticeably.

Femme Harinck from the Erasmus Medical Centre in the Netherlands said over 80 per cent of cases are only identified when the cancer

is in its advanced stage as symptoms often appear late.

According to Harinck, the five-year survival rate for this cancer between 2008 and 2012 was only 7 per cent, far less than the 70 per cent of colon cancer.

Nuria Malats, from the Spanish National Cancer Research Centre and holding a similar view, said the incidence of pancreatic cancer in the US is expected to increase from 40 per 100,000 people in 2010 to 70 per 100,000 people by 2030.

The mortality rate from the cancer, she said, is only second to lung cancer. Both of the two cancers are nowadays among the most difficult to treat. Malats said the exact causes of pancreatic cancer are still not clear, though chronic local inflammations appear to lead to higher risk. (IANS)

Why older people struggle to hear in noisy places

Something must be going on in the brains of older adults that causes them to struggle to follow speech amid background noise, even when their hearing would be considered normal, researchers from University of Maryland have determined.

Researchers Samira Anderson, Jonathan Z. Simon and Alessandro Presacco found that adults aged 61-75 with normal hearing scored significantly worse on speech understanding in noisy environments than adults aged 18-30 with normal hearing.

The researchers studied two areas of the brain. They

looked at the more 'ancentral' midbrain area which does basic processing of all sounds.

They also looked at the cortex which is particularly large in humans and part of which specialises in speech processing.

In the young group, the midbrain generated a signal that matched its task in each case - looking like speech in the quiet environment, and speech clearly discernible against a noisy background in the noise environment.

But in the older



group, the quality of the response to the speech signal was degraded even when in the quiet environment, and the response was even worse in the noisy environment.

"For older listeners, even when there isn't any noise, the brain is already having trouble processing the speech," said Simon.

Neural signals recorded from cortex showed that younger adults could process speech well in a relatively short amount

of time.

But the auditory cortex of older test subjects took longer to represent the same amount of information.

"Part of the comprehension problems experienced by older adults in both quiet and noise conditions could be linked to age-related imbalance between excitatory and inhibitory neural processes in the brain," Presacco added.

This imbalance could impair the brain's ability to correctly process auditory stimuli and could be the main cause of the abnormally high cortical response observed in the

study. "Older people need more time to figure out what a speaker is saying. They are dedicating more of their resources and exerting more effort than younger adults when they are listening to speech," Simon noted in a paper published by the Journal of Neurophysiology.

This eroding of brain function appears to be typical for older adults and a natural part of the ageing process.

The researchers are now looking into whether brain training techniques may be able to help older adults improve their speech comprehension. (IANS)

Teen addiction linked to brain imbalance

If you find your teenage son indulging in alcohol or drugs, do not just blame his peers. A specific imbalance in the functioning of his brain may put him at risk-taking behaviour risk, a study has found.

The study conducted on animals showed that the adolescent-specific behaviour may be driven by an imbalance in activity between the prefrontal cortex (PFC) -- an area of the brain involved in cognitive control and inhibition -- and the nucleus accumbens (NAC) which plays a central role in reward-seeking and addiction.

Researchers from Dartmouth College in New Hampshire in the US said that the low activity in PFC with concurrent high activity in NAC -- an imbalance which appears to exist only during adolescence -- is essentially at odds with each other.

This imbalance is behind the tendency that could lead to potentially dangerous behaviour, including drug use, harmful drinking, addiction, unsafe sex and risky driving, which may result in unintended injuries, violence and/or even premature death.

"Understanding how specific changes in brain function during development relate to behaviour is critically important for determining why some individuals engage in excessive risk-taking behaviour during adolescence," said David J Bucci, professor at Dartmouth College.

For the study, researchers used adult rats, which normally have balanced activity in these areas and used a novel approach to decrease the activity in PFC and simultaneously increase activity in NAC while the rats learned an inhibition task. (IANS)

Folinic acid may help autistic kids improve skills

Reduced form of a B-vitamin known as folinic acid may help improve language and communication skills of children with autism spectrum disorder (ASD), finds a study.

The findings are from a placebo-controlled trial in which children were randomised to receive either high-dose folinic acid or a placebo.

The study, which is published in Springer Nature's journal *Molecular Psychiatry*, also identified a specific blood marker that can be used to predict which patients have the best chance to respond to the treatment.

"The only currently ap-

proved medications for autism are both antipsychotic medications that address non-core symptoms and can lead to unwanted side effects," said John Slattery, researcher at the Arkansas Children's Research Institute, US. Scientific research has linked this disorder to abnormalities in the metabolism of folate as well as genes that are involved in folate metabolism.

Certain studies have also shown that the offspring of women who took folate supplements before conception and during pregnancy had a lower risk of having a child with ASD. (IANS)

The Times of India (Delhi)(20-10-2016 Pg.8)

<http://epaperbeta.timesofindia.com/index.aspx?EID=31808&dt=20161020>

Humans rarely get the bug: Docs Durgesh Nandan Jha

The bird flu scare in Delhi zoo may have caused unease among the public, but doctors say that chances of the viral infection spreading in humans is remote. Dr Lalit Dar, professor of microbiology at AIIMS, said that no confirmed cases of the viral infection have been reported in humans in India yet.

"We saw a few suspected cases of bird flu during the 2006 outbreak, but they could not be confirmed positive for the viral infection," said Dr Arup Basu, senior consultant (chest medicine) at Sir Ganga Ram hospital.

Dr Suranjit Chatterjee, senior consultant, medicine department at Apollo hospital, reiterated that spread of H5N1 (bird flu) to humans is rare. "Nonetheless, we should be careful. It is a good step to close the zoo till the time animals are screened to rule out the possibility of infection," he said.

World Health Organisation states that globally 856 cases of avian influenza A (H5N1) in humans have been reported between 2003 and 2016. Of this, 452 patients died reflecting high mortality of the infection.

"Initial symptoms of bird flu include high fever, sore throat, abdominal pain, chest pain and diarrhoea. But it can manifest into severe symptoms like respiratory distress and pneumonia leading to death," said a doctor. People often ask whether they should eat chicken and other poultry animals when bird flu is prevalent. Health experts said that viruses do not survive when the animal is cooked at high temperature, hence consumption is not risky. However, they advise precaution while visiting a poultry farm or slaughterhouse. Dr K K Aggarwal, president of Indian Medical Association, said that they are planning to come up with guidelines for health providers and the public on early identification of bird flu cases and ways to avoid the spread of infection.

Traders fear panic will affect business

A team from the animal husbandry department on Wednesday visited the Gazipur wholesale market to check the consignments and found nothing worth a concern. Though, the market itself fears that sale could be hit in the coming days.

"We have a government doctor on duty at the mandi who checks random samples from each consignment. If a sample is found unfit, then the entire stock is confiscated," said Haji Salahuddin Qureshi, president of the poultry association at Gazipur.



ALARM BELLS RING: As a precaution, the zoo has been shut for the next three days even as animals are being vaccinated

ALL YOU NEED TO KNOW ABOUT THE VIRUS

WHAT IS H5N1?

A virus that causes a highly infectious and severe respiratory disease in birds called avian influenza or 'bird flu'. Human cases occur occasionally

BIRDS: Infected birds shed flu virus in their saliva, nasal secretions, and faeces. Susceptible birds become infected when they have contact with contaminated excretions or surfaces that are contaminated with excretions

HUMANS: Most cases of bird flu infection in humans have resulted from contact with infected poultry

TRANSMISSION

or contaminated surfaces. There is no evidence of human-to-human transmission so far

INITIAL SYMPTOMS: High fever and bad cough, sore throat, abdominal pain, chest pain and diarrhoea

COMPLICATIONS: Severe respiratory illness, pneumonia and neurological changes (altered mental status or seizures)

TREATMENT is mostly symptomatic. Antiviral medicine Oseltamivir can reduce the severity of illness and prevent death

PREVENTION Avoid direct contact with infected birds, especially poultry, and zoo animals



Vaccines available but not ready for mass use

IS IT SAFE TO EAT CHICKEN? Yes, it is safe to eat properly cooked chicken. Viruses are sensitive to heat and they die when the chicken is cooked at high temperature

