

Bat survey identifies six new coronaviruses

ISLAMABAD: Scientists have discovered six previously unknown coronaviruses in bats. The animals were in regions of Myanmar where humans come into close contact with wildlife as a result of agriculture, deforestation, and other ecological disruption. Scientists have identified six new coronaviruses.

Wild bats are generally beneficial for people living in many areas around the world. They pollinate crops, control pest insects, and produce guano, which farmers collect from caves to use as fertilizer. Many experts think that these mammals were the original hosts of several viruses that pose a significant threat to human health.

These include the coronaviruses that caused the outbreak of severe acute respiratory syndrome (SARS) in 2002-2003, Middle East respiratory syndrome (MERS) in 2012, and, most recently, the global pandemic of COVID-19 that began in Wuhan, China, in December 2019.

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Coronaviruses are a family of viruses that comprise RNA enclosed within an envelope of protein and fat molecules. They commonly infect the respiratory and gastrointestinal tracts of their mammalian and bird hosts. The coronavirus that causes COVID-19, known as SARS-CoV-2, shares 96% of its genetic sequence with a virus found in bats. This led scientists to conclude that SARS-CoV-2 may have jumped species from bats into humans, possibly via pangolins.

A study in 2017 estimated, bats may play host to more than 3,200 coronaviruses, most of which remain undiscovered. A survey conducted in Myanmar, published in the journal PLOS ONE, has identified six new coronaviruses in bats.

Ecological disruption By bringing people and wild animals into closer contact, ecological disruption, such as clearing forests for agriculture, increases the likelihood that viruses will make the leap into human populations, says Marc Valitutto, who led the study.

“Viral pandemics remind us how closely human health is connected to the health of wildlife and the environment,” says Valitutto, a former wildlife veterinarian who now works for the Global Health Program at the Smithsonian National Zoo and Conservation Biology Institute in Washington, DC. “Worldwide, humans are interacting with wildlife with increasing frequency, so the more we understand about these viruses in animals — what allows them to mutate and how they spread to other species — the better we can reduce their pandemic potential.” The project was part of PREDICT, an initiative funded by the U.S. Agency for International Development to discover pathogens with the potential to spread from animals to humans.

It brought together scientists from the Smithsonian, the University of California, Davis, and government scientists in Myanmar. They first identified three sites where humans have come into closer contact with



wildlife populations due to changes in land use and development. Two of the sites included cave systems where people have routine exposure to bats through guano harvesting, religious practices, and ecotourism.

Guano and saliva samples Between May 2016 and August 2018, the scientists caught bats in mist nets, took saliva samples, then released them. They also collected fresh bat guano from the floors and entrances of caves.

In the lab, they screened more than 750 bat saliva and fecal samples for the RNA sequences of coronaviruses. By comparing these with the sequences of known coronaviruses in a database, they were able to

identify the six new coronaviruses. The authors stress that the newly discovered viruses are not closely related to the coronaviruses that cause SARS, MERS, and COVID-19. They also don't know whether the viruses have the potential to cause serious illness in humans. “Many coronaviruses may not pose a risk to people, but when we identify these diseases early on in animals, at the source, we have a valuable opportunity to investigate the potential threat,” says Suzan Murray, who is director of the Smithsonian's Global Health Program and a co-author of the study. “Vigilant surveillance, research, and education are the best tools we have to prevent pandemics before they

occur.” Guano samples accounted for the majority of the coronavirus particles that the researchers found. This suggests that guano may be an important viral transmission route from bats into people and a particular health threat for those who harvest and use it as fertilizer. Emerging infectious diseases Human infections that originate in animals are known as zoonoses. Researchers estimate that 60–75% of emerging infectious diseases are zoonoses, and of these, more than 70% may have originated in wildlife species, such as bats. The authors recommend intensive surveillance of the bat populations that come into close contact with

Colorful fruit and veg may reduce risk of cognitive decline



Changes in the brain can start decades before a person begins to experience cognitive decline and dementia.

There is currently no cure for dementia, so strategies to prevent the condition through lifestyle changes are essential. A large study has found a link between eating foods rich in antioxidants called flavonoids and a significantly reduced risk of experiencing early signs of cognitive decline. Fruits and vegetables, such as strawberries, blueberries, oranges, and peppers, owe their bright colors to plant chemicals known as flavonoids. These phytochemicals have powerful antioxidant properties, which has raised hopes that they could reduce oxidative stress in the brain.

Oxidative stress is a strong candidate for causing age-related cognitive decline and eventually dementia, which affects a person's memory, thinking, and reasoning abilities. In 2014, around 5 million Trusted Source adults aged 65 years and older had dementia in the United States alone. According to projections, this number will increase to nearly 14 million by 2060.

While there are treatments for temporarily alleviating the symptoms of dementia, there is currently no cure available. The search is therefore on to

identify lifestyle factors, such as diet, that can reduce individuals' risk of developing the condition.

Previous research into possible links between eating foods rich in flavonoids and reduced risk of cognitive decline later in life has been inconclusive, however. A new study that followed almost 80,000 middle-aged individuals for more than 20 years has now found that those who consumed the most flavonoids were less likely to experience early signs of cognitive decline in later life. Even after adjustment for other risk factors, such as physical exercise, those who ate the most flavonoids in their diet were 20% less likely to develop subjective cognitive decline compared with those who ate the least.

“There is mounting evidence suggesting flavonoids are powerhouses when it comes to preventing your thinking skills from declining as you get older,” says senior author Dr. Walter Willett, Ph.D., of Harvard University in Boston, MA. “Our results are exciting because they show that making simple changes to your diet could help prevent cognitive decline,” he adds. Flavones, a type of flavonoid present in yellow and orange fruits and vegetables, were associated with a 38% reduction in risk. —Agencies

Eating before bed delays fat burning

ISLAMABAD: Eating breakfast and avoiding late night snacking is best for burning fat and losing weight, new research shows.

A new study confirms that it's not just what you eat but when you eat that counts. With almost half of adults in the United States trying to lose weight, many have turned to daily intermittent fasting as a simple way to shift the pounds. This diet involves fasting for a fixed period of the day and then consuming all calories in the remaining hours. For example, not eating for 16 hours of the day and eating only in the remaining 8 hours is known as 16:8 fasting. Intermittent fasting has become increasingly common, with a 2018 survey of 1,009 adults in the U.S. finding it to be the most popular diet. But does it matter what time of the day you fast?

According to researchers from Vanderbilt University in Nashville, TN, it is not only the number of calories that a person consumes that may influence weight gain but also when the person consumes them. Follow the biological clock. The findings relate to the biological clock, which scientists refer to as circadian rhythms. The internal body clock modulates hundreds of processes, from sleeping and eating to body temperature and hormone levels. Research has associated a disrupted circadian rhythm, such as that affecting shift workers, with adverse health effects, including obesity.

These health effects may be due to disturbed eating patterns, which suggests that the timing of food consumption mediates its effects on the body. “There are a lot of studies on both animals and humans that suggest it's not only about how much you eat but rather when you eat,” explains Prof. Carl Johnson, senior author of the study and Cornelius Vanderbilt Professor of Biological Sci-



ences. To test this hypothesis, the researchers monitored the metabolism of six people when they ate meals at different times of the day. Monitoring metabolism The participants were all aged 50 years or above, thus belonging to a group that may be at risk for metabolic disorders. They each ate three meals per day over two separate 56-hour sessions, both with the same overnight fasting period.

In one of the sessions, the participants ate breakfast, lunch, and dinner. In the other session, the participants skipped breakfast but received an extra meal as a late evening snack. The breakfast (at 8:00 a.m.) and the late evening snack (at 10:00 p.m.) both contained 700 calories and were nutritionally equivalent. The amount of physical activity that the participants did was also the same in both sessions. The researchers monitored the participants' metabolism using Vanderbilt's human metabolic chamber to give them continual measurements of metabolic rate and the breakdown of carbohydrates and fats. Skipping breakfast vs. dinner The researchers found that, despite having a consistent calorie

intake and activity level, the timing of food intake had a significant effect on how much fat the participants burned. When the participants ate a late night snack, they broke down less fat than when they consumed the same number of calories at breakfast.

In other words, the 10:00 p.m. snack delayed the body's ability to break down fat, causing it to break down carbohydrates instead. On average, the participants who ate breakfast burned 15 grams more of lipid over 24 hours than those who ate the late night snack. Over time, this could lead to significant fat accumulation. “This confirms that the timing of meals during the daytime and nighttime cycle affects how ingested food is used versus stored, and that any food ingested prior to bedtime will delay the burning of fat during sleep,” explains first author and Vanderbilt postgraduate student Kevin Kelly. The finding that the body's circadian rhythms regulate fat burning could have important implications for eating habits, suggesting that fasting from dinner to breakfast is better for weight loss than skipping breakfast. —Online

Faulty blood clotting mechanism may explain COVID-19 severity

ISLAMABAD: One of the things we know about COVID-19 so far is that people who already have certain conditions are more likely to have a severe form of the disease. New research helps to explain why and points to an impaired blood clotting system.

Research suggests an impaired blood clotting mechanism helps explain why some people have more severe forms of COVID-19.

The conditions that raise the risk of COVID-19 severity are high blood pressure, diabetes, heart disease, cerebrovascular disease, respiratory conditions such as chronic obstructive pulmonary disease (COPD), and conditions affecting the kidneys.

Researchers are still investigating the precise reasons and mechanisms for why these

conditions make COVID-19 outcomes so much worse. The authors of a new review study — appearing in the journal Physiological Reviews — note that hemorrhage or bleeding disorders are among the leading causes of death for these patients.

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Why hyperfibrinolysis may be to blame

This overactivity of the body's attempts to remove blood clots is known as hyperfibrinolysis. Fibrinolysis is “an enzymatic system [...] that serves to localize and limit clot formation,” according to research.

In fibrinolysis, a clotting protein called fibrin is broken down, or degraded, through a process that two opposing “forces” drive. These opposite drivers “regulate pro and con

the conversion of plasminogen to plasmin, the active enzyme that dissolves the fibrin clot into soluble fibrin degradation products.”

D-dimer levels also key Additionally, according to studies that the authors reference, more than 97% of people who doctors admitted to hospital for COVID-19 have raised levels of another protein called D-dimer.

D-dimer forms in the blood when a blood clot dissolves. Researchers found raised D-dimer levels in patients with severe disease, explain the authors of the review. The more severe COVID-19 becomes, the more D-dimer levels increase, particularly in the case of patients who develop acute respiratory distress syndrome (ARDS). “In contrast, D-dimer levels decreased to control levels in [COVID-19] survivors or nonARDS patients,” write Dr. Ji and colleagues.

“The time [period] for the elevated D-dimer [to go] down in mild [cases] or survivors is dependent. Generally, it takes at least 1 week for mild [cases] but longer for severe patients,” says Dr. Ji, who is also the corresponding author of the study. —Online

