New finding about rapamycin may help slow aging

A study outlines a new understanding of how a compound called rapamycin works that may help address neurologic damage such as Alzheimer's disease.

"It's possible this could provide a new therapeutic approach to neurologic disease," said Viviana Perez, an assistant professor in the Department of Biochemistry and Biophysics in the Oregon State University (OSU) College of Science.

In a study published in Aging Cell, the researchers said they have identified two mechanisms of action of rapamycin. One was already known. The newly-discovered mechanism is what the researchers say might help prevent neurologic damage and some related diseases.

"The value of rapamycin is clearly linked to the issue of cellular senescence, a stage cells reach where they get old, stop proliferating and begin to secrete damaging substances that lead to inflammation," said Perez, an expert on the biological processes of aging. "Rapamycin appears to help stop that process."

The secretion of damaging compounds creates a toxic environment called senescence-associated secretory phenotype, or SASP, disrupting the cellular microenvironment and altering the ability of adjacent cells to function properly, compromising their tissue structure and function. And this broad process is believed to be linked to aging.

"The increase in cellular senescence associated with aging, and the inflammation associated with that, can help set the stage for a wide variety of degenerative disease, including cancer, heart disease, diabetes and neurologic disease, such as dementia or Alzheimer's," Perez explained. "In laboratory animals when we clear out senescent cells, they live longer and have fewer diseases. And rapamycin can have similar effects."

It had been observed, prior to this research, that there was one mechanism of action for rapamycin in this process. And it was believed that rapamycin helped to increase the action of Nrf2, a master regulator that can "turn on" up to 200 genes responsible for cell repair, detoxification of carcinogens, protein and lipid metabolism, antioxidant protection and other factors. In the process, it helped reduce levels of SASP.

The new study showed that rapamycin could also affect levels of SASP directly, separately from the Nrf2 pathway and in a way that would have impacts on neurons as well as other types of cells. "Any new approach to help protect neurons from damage could be valuable," Perez was quoted as saying in a news release.

A natural compound first discovered from the soils of Easter Island in the

South Pacific Ocean, Rapamycin has already been intensively studied because it can mimic the valuable effects of dietary restriction, which in some animals has been proven to extend their lifespan. Laboratory mice that have received rapamycin have demonstrated more fitness, less decline in activity with age, improved cognition and cardiovascular health, less cancer, and a longer life.

Through its ability to help prevent SASP-related cellular damage through two pathways, one involving Nrf2 and the other more directly, rapamycin will continue to generate significant interest in addressing issues related to aging, Perez said. However, the use of rapamycin in humans has so far been constrained by an important side effect, an increase in insulin resistance that may raise the risk of diabetes.

Beijing starts landmark medical reform

People read informations on medical reforms at Peking Union Medical College Hospital in Beijing, capital of China, April 8, 2017. Beijing started a landmark reform drive Saturday that will separate drug sales from medical treatment at public hospitals, lower medical expenses and improve services for patients. [Photo/Xinhua]

Beijing started a landmark reform drive Saturday that will separate drug sales from medical treatment at public hospitals, lower medical expenses and improve services for patients.

As of 6 am, 2,605 Beijing hospitals had switched to a new billing system,

which replaced a registration and treatment fee with a higher medical service charge but scraped the previous markup on drugs, which was as high as 15 percent in the old pricing system.

The reform is applicable to more than 3,600 medical institutions citywide, while some 1,000 small village clinics are not yet equipped with computerized billing system, said Gao Xiaojun, spokesperson with Beijing health and family planning commission.

At Beijing Children's Hospital, one of the busiest downtown hospitals, dozens of children and their parents at the emergency room shortly after midnight.

One father, surnamed Zhang, said he had paid 10 yuan under the local medical insurance program to see a doctor, five times the former fee he had to pay out of his own pocket. "But it was not a big deal," he said. "We are quite happy that medication will be cheaper."

A mother who was collecting a prescription for her child commented on the average drop of 10 percent in drug prices.

Price changes were also seen across 435 medical services offered at public hospitals and clinics.

The reform has reduced fees for the use of certain equipment, such as computed tomography (CT) and nuclear magnetic resonance (NMR), but increased charges for certain medical services that involve a lot of experience, expertise or staff time.

According to calculations, the overall medical costs for Beijing residents will remain balanced and there will be no increased burden on patients, said Fang Laiying, head of the Beijing municipal health and family planning commission.

"Separating treatment and drug sales will stop over-prescription and help medical practitioners provide better treatment," said Fang.

To ensure medicine prices drop, Beijing has mandated transparent drug purchases, choosing suppliers through open bidding and requiring the full disclosure of drug and producer information.

Meanwhile, community hospitals and medical institutions have been given the same access to medicines that were once only prescribable by high-level hospitals.

More than 90 percent of Beijing's hospitals have taken action to improve their services since the reform plan was published on March 22, said Fang.

2 new H7N9 cases reported in central China

Two new cases of H7N9 infection were reported from March 31 to April 6 in central China's Hunan Province, health authorities said Saturday.

Live poultry trading has been suspended in the provincial capital Changsha since March 17, which will last until the end of April.

Nationwide, 79 people died in January from the virus, according to the National Health and Family Planning Commission.

H7N9 is a bird flu strain first reported to have infected humans in China in March 2013. Infections are most likely occur in winter and spring.

Disease control and prevention experts have said that the H7N9 virus is not transmitted from person to person.

Experts recommend that people avoid contact with dead and live poultry, and only buy poultry with quarantine certificates.

Govt cuts budget on overseas trips, vehicles, receptions

The central government has continued to cut its annual budget for overseas trips, vehicles and receptions this year.

Central government departments will spend a maximum of 6.15 billion yuan (891 million U.S. dollars) on the "three public consumptions" in 2017, down 31 million yuan from 2016, according to the Ministry of Finance (MOF).

Expenses on overseas visits will reach no more than 1.88 billion yuan, while 3.5 billion yuan was budgeted for the purchase and maintenance of government vehicles and 761 million yuan for official receptions.

The MOF said the 2017 budget will give a priority to funding important overseas visits, reception of foreign guests, as well as participation in international meetings.

In addition, central departments will need to replace their vehicles with greener cars in line with Beijing's policy on emission reduction, the MOF said.

China has long been bedeviled by officials using their expenses accounts to

travel in the name of official visits, use work vehicles on personal errands, and enjoy luxurious receptions and accommodation.

However, the frugality campaign launched by central authorities is driving down the expenses in a bid to build a cleaner and more transparent government.

Thunderstorms to hit central, southeast China

Thunderstorms and heavy rains are forecast to hit parts of central and southeast China in the next 24 hours, the national observatory warned Saturday.

From Saturday evening to Sunday evening, parts of Hubei, Anhui, Hunan, Jiangxi, Zhejiang and Fujian provinces will be lashed by thunderstorms, wild winds or hailstones, according to the National Meteorological Center (NMC).

The center issued a blue alert, the lowest in a four-tier warning system, for severe convective weather for the above-mentioned regions, predicting precipitation of 20 to 40 millimeters per hour, or even 50 millimeters per hour, in some areas.

The NMC cautioned that local governments should take emergency measures against thunderstorms, strong wind and potential disasters, including mountain floods and landslides.

China has a four-tier color-coded weather warning system, with red representing the most severe warning, followed by orange, yellow and blue.