

[Home](#) / [Science and Environment](#) / Indian drug to fight existing, emerging Covid strains

New Indian drug candidates to fight existing as well as emerging Covid strains and influenza

The candidates belong to a class of chemicals known as diphenylurea derivatives or DPUDs



Kalyan Ray, DHNS , New Delhi, MAY 24 2023, 21:59 IST | UPDATED: MAY 25 2023, 07:56 IST



Representative Image. Credit: Reuters File Photo

NEW

Newsletters

Subscribe
To Epaper

... remarkably well against disease causing variants of Covid-19 and influenza but also remain effective in tackling the emerging strains. Moreover, the candidate medicine has the ability to overcome drug resistance that makes some of the current generation antivirals ineffective after some time.

Developed by a team of biologists and chemical scientists, these drug candidates have been found to completely block SARS-CoV-2 variants of concern like the Wuhan, Delta and Omicron strains, besides inhibiting H1N1 and H3N2 strains of influenza to spread inside the cells.

Also Read | [Out of stock: Health department stops third dose of Covid jabs](#)

The candidates belong to a class of chemicals known as diphenylurea derivatives or DPUDs. "We have altogether identified five DPUDs that are capable of blocking both SARS-CoV-2 and influenza virus by 95-100 per cent," Indranil Banerjee, one of the lead scientists from Indian Institute of Science, Education and Research, Mohali told DH.

His collaborator Prabal Banerjee at Indian Institute of Technology, Ropar was experimenting with this chemical before the Covid-19 pandemic. Once the pandemic struck, the team also comprising researchers from Indian Institute of Science, Bengaluru and CSIR's Institute of Microbial Technology, Chnadiragh decided to check their antiviral properties.

WHAT'S HAPPENING IN BENGALURU

B'luru: Trip goes wrong, 2 students drown, 2 missing

K'taka: Delivery boy drowns during fishing trip

[VIEW ALL](#)



The scientists prepared 23 DPUDs and found excellent virus-blocking properties in five of them. They block the viral entry -- the first step of the viral life cycle -- and stop the pathogens at the cell entrance itself, preventing further progression of infection. Also, despite interfering with the host cell machinery, they don't induce any apparent toxicity in the host, highlighting their potential in clinical applications with minimum or no side effects.

"We have found that DPUDs don't induce any resistance in the virus. We compared the FDA-approved anti-influenza drug Tamiflu with DPUDs to check the induction of resistance in influenza virus. While Tamiflu became ineffective after some time, DPUDs didn't induce any resistance and remained effective even after prolonged exposure to influenza virus," he said.

The scientists claimed that these drug candidates remained effective even after the emergence of a new strain - a property rare to find out among antiviral medicines.

"This is a nice piece of work, which is carefully done and has important implications. However, the results should not be over interpreted to mean that we have a broad spectrum antiviral drug. At this point it's an interesting lead," commented eminent virologist Shahid Jameel, who is not associated with the study.

After demonstrating the efficacy in cultured cells, the team carried out experiments in mice. They infected the animals with the SARS-CoV-2 or influenza virus and subsequently treated them with the DPUDs.

Those received treatment displayed remarkable body weight recovery, improved survival and marked reduction in lung viral load, highlighting their potential as highly-effective, broad-spectrum antivirals.

Half of the untreated Covid-infected mice died, but each one under the DPUD treatment survived, they reported in a recent issue of PloS Pathogen.

The (compounds') mechanism of action, nicely carved out by the authors, involves disturbances in chloride homeostasis (or balance) inside cells," said Jameel, currently a Research Fellow at Green Templeton College, University of Oxford.

"It is well worth remembering that chloride ions play an important role in controlling the function of neurons in the central nervous system. Its dysregulation leads to seizures and is associated with conditions like schizophrenia, Down's Syndrome, Autism and others. That these symptoms were not observed in mice is encouraging, but mice and humans are different. This requires more

NEW

Newsletters

Subscribe
To Epaper

Get a round-up of the day's top stories
in your inbox

Email Address

Sign Up

Check out all newsletters

[Deccan Herald News now on Telegram - Click here to subscribe](#)[Follow us on Facebook / Twitter / Dailymotion / YouTube](#)

Scientists

Covid-19

Coronavirus

Covid-19 vaccine

India News

What is your reaction?

Powered by Vuukle

Advertisement



Comments



Commenting is not available for now

RELATED VIDEOS

RELATED STORIES

<

HC refuses urgent hearing on self-styled godman’s event...
25th May 2023

Fire incidents in Kerala raising eyebrows
25th May 2023

Village official's illegal wealth unearthed in Kerala
25th May 2023

>

WHAT'S BREWING

a woman
looks to
global
recor
the
2

<

>

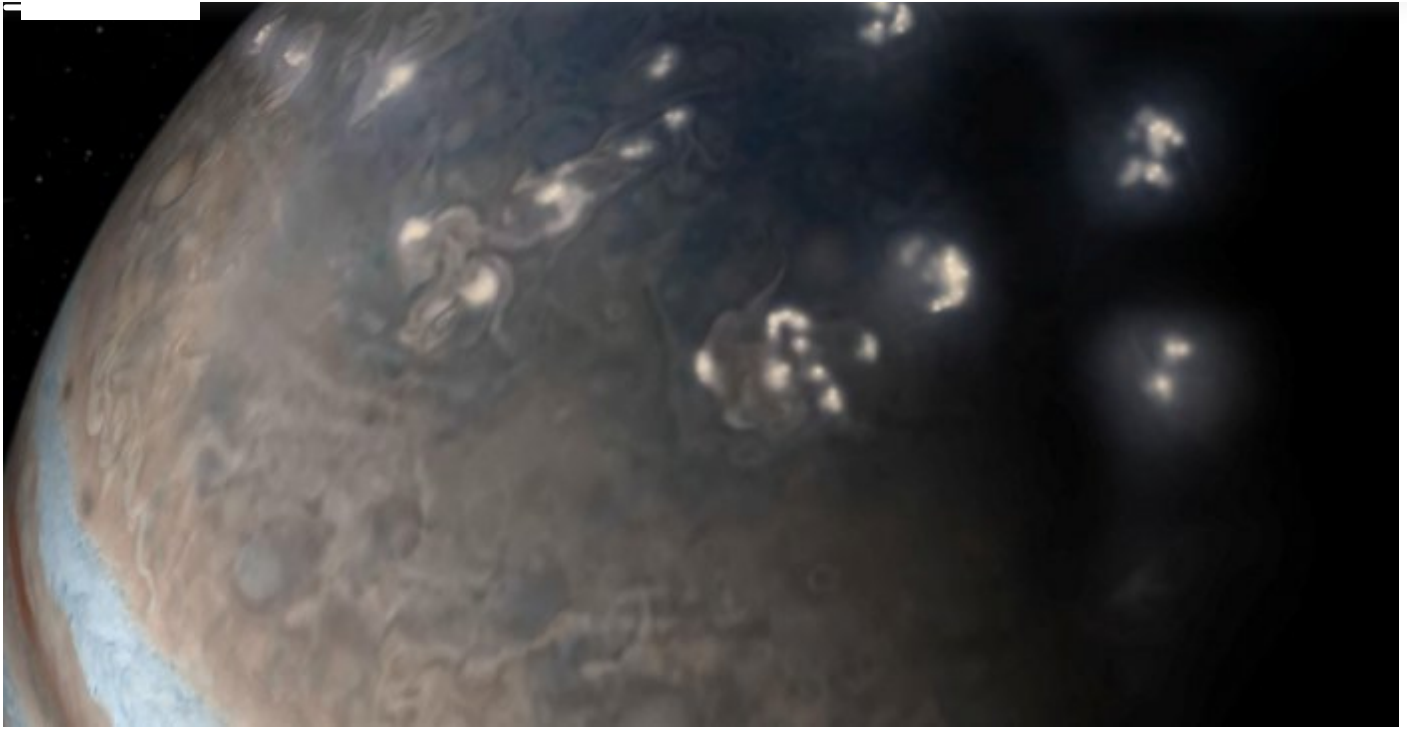
NEXT STORY

[Home](#) / [Science and Environment](#) / [NASA documents how Jupiter lightning resembles Earth's](#)

NASA spacecraft documents how Jupiter's lightning resembles Earth's

Jupiter is a gas giant so immense that all the other planets in our solar system could neatly fit inside it - including more than 1,300 Earths





Hidden below the brownish ammonia clouds blanketing Jupiter are clouds that like on Earth are made of water. And like on Earth, lightning often is generated within these clouds - an eerie sight spotted by various spacecraft that have visited our solar system's largest planet, including NASA's Juno probe.

Data obtained by Juno is providing fresh information on how the lightning processes on Jupiter are similar to those on Earth despite the dramatic differences between the two planets, according to scientists.

Earth is a relatively small rocky world. Jupiter, whose namesake ancient Roman god flung lightning bolts, is a gas giant so immense that all the other planets in our solar system could neatly fit inside it - including more than 1,300 Earths.

Read | [SpaceX sends Saudi astronauts, including nation's 1st woman in space, to International Space Station](#)

Tapping into five years of high-resolution data acquired by Juno's radio receiver as the spacecraft orbits Jupiter, the researchers found that the planet's lightning initiation processes pulsate with a similar rhythm to that observed inside clouds on our planet. The pulses observed on Jupiter as flashes of lightning were initiated with time separations of about a millisecond, similar to thunderstorms on Earth.

K'taka: Delivery boy drowns during fishing trip



Bengaluru's annual rainfall surges 89% in 5 years



Lightning is the most powerful naturally occurring electrical source on Earth.

"Lightning is an electric discharge which is initiated inside thunderclouds. The ice and water particles inside the cloud get charged by collisions and form layers of particles with the charge of the same polarity," said planetary scientist Ivana Kolmasova of the Czech Academy of Sciences' Institute of Atmospheric Physics in Prague, lead author of the study published this week in the journal Nature Communications.

"By this process, a huge electric field is established and the discharge can be initiated. This explanation is somewhat simplified because scientists are still not completely sure what is exactly happening inside thunderclouds," Kolmasova added.

The existence of lightning on Jupiter was confirmed when telltale radio emissions at audible frequencies were recorded in 1979 by NASA's Voyager 1 spacecraft as it ventured through the solar system.

The solar system's other gas planets - Saturn, Uranus and Neptune - also have been shown to have lightning. There is some evidence for lightning in the clouds of the rocky planet Venus, though it is still a matter of debate.

Other studies have detailed other similarities in the lightning processes on Jupiter and Earth. For instance, lightning rates on the two planets are similar though the distribution of lightning on Jupiter differs from Earth.

"On Earth, the tropical regions are the most active ones. The majority of Jovian lightning occurs in mid-latitudes and also in polar regions. We have nearly no lightning activity close to the poles on the Earth. It means that conditions for the formation of Jovian and terrestrial thunderclouds are probably very different," Kolmasova said.

"There were some attempts to compare the power of lightning based on optical measurements and it was concluded that lightning on Jupiter might be comparable with the strongest terrestrial lightning," Kolmasova added, while noting that more analysis is planned.

NEW

Newsletters

Subscribe

To Epaper

... iminate the colossal appearance of Jupiter, the main planet from the sun with a diameter of about 88,850 miles (143,000 km).

Juno has been orbiting Jupiter since 2016, obtaining information about its atmosphere, interior structure, internal magnetic field and the region around it created by its internal magnetism.

Get a round-up of the day's top stories
in your inbox

Email Address

Sign Up

Check out all newsletters

[Deccan Herald News now on Telegram - Click here to subscribe](#)

[Follow us on Facebook / Twitter / Dailymotion / YouTube](#)

Science News

Jupiter

Earth

NASA

RELATED VIDEOS

RELATED STORIES

- <

Paralysed man walks via
thought-controlled implants
- Previous smallpox vaccine
provides immunity to mpox
- Microplastics in recycling
process raises concerns

>

WHAT'S BREWING

[Home](#) / [Science and Environment](#) / Paralyzed man walks via thought-controlled implants

Paralysed man walks again via thought-controlled implants

The 40-year-old Dutchman has been paralysed in his legs for more than a decade after suffering a spinal cord injury during a bicycle accident



AFP, Paris, MAY 24 2023, 22:02 IST | UPDATED: MAY 24 2023, 22:02 IST



A paralysed man has regained the ability to walk smoothly using only his thoughts for the first time, researchers said on Wednesday, thanks to two implants that restored communication between brain and spinal cord.

The patient Gert-Jan, who did not want to reveal his surname, said the breakthrough had given him "a freedom that I did not have" before.

The 40-year-old Dutchman has been paralysed in his legs for more than a decade after suffering a spinal cord injury during a bicycle accident.

study published in the journal Nature.

The advance is the result of more than a decade of work by a team of researchers in France and Switzerland.

WHAT'S HAPPENING IN BENGALURU

[VIEW ALL](#)

B'luru: Trip goes wrong, 2 students drown, 2 missing



K'taka: Delivery boy drowns during fishing trip



Bengaluru's annual rainfall surges 89% in 5 years



Also Read | [Over 800 million people may suffer back pain by 2050: Lancet study](#)

Last year the team showed that a spinal cord implant -- which sends electrical pulses to stimulate movement in leg muscles -- had allowed three paralysed patients to walk again.

But they needed to press a button to move their legs each time.

Gert-Jan, who also has the spinal implant, said this made it difficult to get into the rhythm of taking a "natural step".

The latest research combines the spinal implant with new technology called a brain-computer interface, which is implanted above the part of the brain that controls leg movement.

The interface uses algorithms based on artificial intelligence methods to decode brain recordings in real time, the researchers said.

This allows the interface, which was designed by researchers at France's Atomic Energy Commission (CEA), to work out how the patient wants to move their legs at any moment.

The data is transmitted to the spinal cord implant via a portable device that fits in a walker or small backpack, allowing patients to get around without help from others.

The two implants build what the researchers call a "digital bridge" to cross the disconnect between the spinal cord and brain that was created during Gert-Jan's accident.

NEW**Newsletters****Subscribe
To Epaper**

After undergoing invasive surgery twice to implant both devices, it has "been a long journey to get here," he told a press conference in the Swiss city of Lausanne.

But among other changes, he is now able to stand at a bar again with friends while having a beer.

"This simple pleasure represents a significant change in my life," he said in a statement.

Gregoire Courtine, a neuroscientist at Switzerland's Ecole Polytechnique Federale de Lausanne and a study co-author, said it was "radically different" from what had been accomplished before.

"Previous patients walked with a lot of effort -- now one just needs to think about walking to take a step," he told a press conference in the Swiss city of Lausanne.

There was another positive sign: following six months of training, Gert-Jan recovered some sensory perception and motor skills that he had lost in the accident.

He was even able to walk with crutches when the "digital bridge" was turned off.

Guillaume Charvet, a researcher at France's CEA, told *AFP* this suggests "that the establishment of a link between the brain and spinal cord would promote a reorganisation of the neuronal networks" at the site of the injury.

So when could this technology be available to paralysed people around the world? Charvet cautioned it will take "many more years of research" to get to that point.

But the team are already preparing a trial to study whether this technology can restore function in arms and hands.

They also hope it could apply to other problems such as paralysis caused by stroke.

Get a round-up of the day's top stories
in your inbox

Email Address


Sign Up

Check out all newsletters

Deccan Herald News now on Telegram - Click here to subscribe

RELATED VIDEOS


RELATED STORIES



Imran Khan's close aide
Fawad Chaudhry quits PTI
party...

Grave of Mahsa Amini
vandalised in Iran

Sunak gives Suella Braverman
clean chit on driving fine...



WHAT'S BREWING



a woman
looks to
grab
the
win

NEXT STORY



[Home](#) / [Science and Environment](#) / [Previous smallpox vaccine provides immunity to mpox](#)

Previous smallpox vaccine provides immunity to mpox, finds study

The virus that causes mpox is known as an orthopoxvirus and is very similar to the virus that caused smallpox until the mid-1970s





PTI, New Delhi,

MAY 24 2023, 19:12 IST | UPDATED: MAY 24 2023, 19:12 IST



Vaccines against smallpox given until the mid-1970s offer continuing immunity against monkeypox, a study conducted in Sweden has found.

During last year's mpox (formerly monkeypox) outbreak, the virus spread for the first time outside Africa, causing over 85,000 cases of the disease to date.

Men who have sex with men account for the most infections, with a marked skew towards the young, the researchers said.

Also Read | [WHO declares end to monkeypox public health emergency](#)

The virus that causes mpox is known as an orthopoxvirus and is very similar to the virus that caused smallpox until the mid-1970s when it was finally eradicated.

WHAT'S HAPPENING IN BENGALURU

[VIEW ALL](#)

B'luru: Trip goes wrong, 2 students drown, 2 missing



K'taka: Delivery boy drowns during fishing trip



Bengaluru's annual rainfall surges 89% in 5 years



researchers at Karolinska Institutet in Sweden wondered if the individuals who were vaccinated decades ago against the former would have some protection against the latter owing to a remaining memory response.

"Our study shows that this is the case, which implies that the memory cells are very long-lived and that they can recognise closely related viruses such as the mpox virus and provide overlapping, or cross-reactive immunity," said the study's corresponding author Marcus Buggert, researcher at Karolinska Institutet.

By analysing the T-cell immune response in 105 healthy blood donors, the study, published in the journal *Cell Host & Microbe*, showed that individuals born before 1976 had a significantly stronger immune response against both viral types.

The researchers also analysed the immune response in 22 men with a recent mpox infection and showed that they also exhibited a strong immune response to the virus, which may provide future immunity.

The current study was too small to judge how much protection previous smallpox vaccination provides, but Buggert refers to a recently published British observational study examining the effect of a smallpox vaccine given to risk-group males in 2022.

"This study shows that smallpox vaccine can provide about 80 per cent protection against mpox," he said.

Mpox is a viral infection spread mainly through close physical contact with an infected person. Sexual contact poses a particularly high risk.

Common symptoms are blistering, sores and rashes, fever, and swollen glands. It can also cause pain and discomfort but typically clears up on its own after two to four weeks.

In Sweden, the smallpox vaccination programme started in the early 19th century and was discontinued in 1976 when the disease was eradicated.

The vaccine was mandatory for the entire population. The vaccine currently given for mpox is essentially a smallpox vaccine.

NEW

Newsletters

Subscribe

To Epaper

Get a round up of the day's top stories
in your inbox

Email Address

Sign Up

Check out all newsletters

Deccan Herald News now on Telegram - Click here to subscribe

Follow us on Facebook / Twitter / Dailymotion / YouTube

Science and Environment

Science News

Smallpox

Monkeypox

Vaccine

RELATED VIDEOS

RELATED STORIES

<

Microplastics in recycling
process raises concerns

Climate scientists leave
Twitter as hostility mounts

Man's anti-ageing blood
transfusion involves dad &
son...

>

WHAT'S BREWING

a
woma

looks
to

ghai
recor

the
the

can

<

NEXT STORY

>

Recycling can release massive amounts of microplastics, finds study, raising questions about sustainability

While the study analysed microplastics released by one recycling plant in the UK, researchers expressed concern about the situation worldwide



Shiladitya Ray, DH Web Desk, MAY 24 2023, 17:36 IST | UPDATED: MAY 24 2023, 18:06 IST



Recycling has long been touted by the plastics industry as a solution to the burgeoning problem of plastic waste, but a new study challenges this assumption, and has found that recycling itself releases massive amounts of microplastics.

The study, conducted by a team of scientists at the University of Strathclyde in Glasgow and [published](#) in the *Journal of Hazardous Material Advances*, analysed wastewater samples from a state-of-the-art recycling plant in the UK, and found that microplastics released in the water samples amounted to 13 per cent of plastic processed at the recycling plant.

Based on this, the scientists estimated that the facility could be releasing up to 75 billion plastic particles in each cubic metre of wastewater.

Also Read | [Ways to make the future sustainable](#)**WHAT'S HAPPENING IN BENGALURU**[VIEW ALL](#)

B'luru: Trip goes wrong, 2 students drown, 2 missing



K'taka: Delivery boy drowns during fishing trip



Bengaluru's annual rainfall surges 89% in 5 years



"It's scary because recycling has been designed in order to reduce the problem and to protect the environment. This is a huge problem we're creating," she added.

The researchers also tested the water before and after the recycling plant installed a water filtration system, and found that the filter managed to reduce the concentration of microplastics in water from 13 per cent to 6 per cent, thereby indicating that filtration systems could help address but not entirely eliminate the issue.

In addition to finding microplastics in wastewater around the facility, the scientists also found high levels of microplastics in the air around the facility, with 61 per cent said particles being less than 10 microns in size—something that has been found to be a cause for illness among humans.

"More than 90 per cent of the particles we found were under 10 microns and 80 per cent were under 5 microns. These are digestible by so many different organisms and found to be ingested by humans," Brown told *The Guardian*, commenting on the size of the particles found.

While the study analysed microplastics released by one recycling plant in the UK, researchers expressed concern about the situation worldwide.

"An important consideration is what other plants globally are emitting. This is something we really need to find out," Brown further said, adding that findings from the facility analysed in the US represented a "best case scenario".

Microplastics are defined as any particle of plastic measuring less than 5 mm, and has been found virtually everywhere across the planet. from the Arctic snow to the depths of the ocean. Despite

NEW

Newsletters

Subscribe
To Epaper

Get a round up of the day's top stories
in your inbox

Email Address Sign Up

Check out all newsletters

Deccan Herald News now on Telegram - Click here to subscribe


Follow us on Facebook / Twitter / Dailymotion / YouTube

recycling Microplastics sustainability environment Pollution

Science News

RELATED VIDEOS


RELATED STORIES



Climate scientists leave
Twitter as hostility mounts

Man's anti-ageing blood
transfusion involves dad &
son...

TB vaccine may have
protective effect against
Alzheimer...



WHAT'S BREWING



a
woma

looks
to

ghat
recor

the
the

can
a



NATIONAL

NEW

Newsletters

Subscribe
To Epaper

West

KARNATAKA

Top Stories

Politics

Districts

BENGALURU

Top Stories

Bengaluru Crime

Politics

Infrastructure

Life in the City

SPORTS

Cricket

Formula 1 with DH

Football

Tennis

Sportscene

Other Sports

BUSINESS

Business News

Family Finance

Technology

DH Wheels

MULTIMEDIA

Videos

Photos

OPINION

DH Views

Editorials

Panorama

Comment

In Perspective

Right in the Middle

ENTERTAINMENT

NEW

Newsletters

**Subscribe
To Epaper**

Arts, Books & Culture

KARNATAKA PORTFOLIO ALLOCATION

MYTH-MAKING IN A DEMOCRATIC ERA

INDIAN IT INDUSTRY: TIMES, THEY ARE A CHANGIN'...

WRESTLERS' PROTEST: FIR AGAINST ORGANISERS

DH GALLERIES

TRENDING NEWS

Mangaluru-Bengaluru IndiGo flight diverted to Dubai

B'luru: Teen says doctor examined her under CCTV camera

There's such a thing as a free lunch

Centre to mint ₹75 coin to mark new Parliament opening

Hospital told to pay Rs 1.5 cr for death of woman

SERVICES

[About](#) [Epaper](#) [Archives](#) [Sitemap](#) [Classifieds](#) [Contact](#)

OUR GROUP SITES

[Printers Mysore](#) [Prajavani](#) [Sudha](#) [Mayura](#) [Exam Mastermind](#)

DOWNLOAD DH APP



[Privacy Policy](#) [Terms](#) [Disclaimer](#) [Grievance Redressal](#)

© 2023 The Printers (Mysore) Private Ltd.