

HAPPENINGS

Weekly Edition
Friday, August 5, 2022

Reinfection, severe outcome more common with BA.5 variant

Compared with the earlier Omicron BA.2 subvariant, currently dominant Omicron BA.5 is linked with higher odds of causing a second SARS-CoV-2 infection regardless of vaccination status, a study from Portugal suggests.

From late April through early June, researchers there studied 15,396 adults infected with the BA.2 variant and 12,306 infected with BA.5. Vaccines and boosters were equally effective against both sublineages, according to a report posted last week on medRxiv ahead of peer review. However, 10% of BA.5 cases were reinfections, compared to 5.6% of BA.2 cases, which suggests a reduction in protection conferred by previous infection against BA.5 compared to BA.2, the researchers said. Moreover, the vaccines appeared to be less effective in reducing the risk of severe outcomes for BA.5 compared with BA.2.

"Among those infected with BA.5, booster vaccination was associated with 77% and 88% reduction in risk of COVID-19 hospitalization and death, respectively, while higher risk reduction was found for BA.2 cases, with 93% and 94%, respectively," the researchers wrote. While "COVID-19 booster vaccination still offers substantial protection against severe outcomes following BA.5 infection," they said, their findings provide "evidence to adjust public health measures during the BA.5 surge."

The spike protein on its surface that the coronavirus uses to break into heart muscle cells also triggers a damaging attack from the immune system, according to new research. The SARS-CoV-2 spike protein interacts with other proteins in cardiac myocytes to cause inflammation, researchers said on last week in a presentation at the American Heart Association's Basic Cardiovascular Sciences Scientific Sessions 2022. In experiments with mice hearts, comparing the effects of SARS-CoV2 spike proteins and spike proteins from a different, relatively harmless coronavirus, the researchers found that only the SARS-CoV-2 spike protein caused heart dysfunction, enlargement and inflammation. Further, they found in infected heart muscle cells, only the SARS-CoV-2 spike interacted with so-called TLR4 proteins (Toll-like receptor-4) that recognize invaders and trigger inflammatory responses.

In a deceased patient with COVID-19 inflammation, the researchers found the SARS-CoV-2 spike protein and

TLR4 protein in both heart muscle cells and other cell types. Both were absent in a biopsy of a healthy human heart.

"That means once the heart is infected with SARS-CoV-2, it will activate the TLR4 signaling," Zhiqiang Lin of the Masonic Medical Research Institute in Utica, New York said in a statement. "We provided direct evidence that spike protein is toxic to the heart muscle cells and narrowed down the underlying mechanism as spike protein directly inflames the heart muscle cells. More work is being done in my lab to test whether and how spike protein kills heart muscle cells."

All this research is not without purpose. A new monoclonal antibody combination can prevent and treat Omicron infections in monkeys, researchers reported last week in *Nature Microbiology* (<https://www.nature.com/articles/s41564-022-01198-6>). The antibodies, called P2G3 and P5C3, recognize specific regions of the spike protein the SARS-CoV-2 virus uses to enter cells. "P5C3 alone can block all SARS-CoV-2 variants that had dominated the pandemic up to Omicron BA.2," said Dr. Didier Trono of the Swiss Institute of Technology in Lausanne. "P2G3 then comes to the rescue as it not only can neutralize all previous SARS-CoV-2 variants of concern, but it can also block BA.4 and BA.5," he said. "P2G3 is even effective against some BA.2 or BA.4/BA.5 mutants capable of escaping bebtelovimab, the only antibody approved for the clinics still displaying activity against the currently dominant BA.4/BA.5 subvariants."

In lab experiments, mutations that might make SARS-CoV-2 variants resistant to P2G3 did not allow escape from P5C3, and P5C3 escape mutants were still blocked by P2G3, Trono said. "In essence, the two antibodies cover for each other, one filling in for the lapses of the other and vice versa."

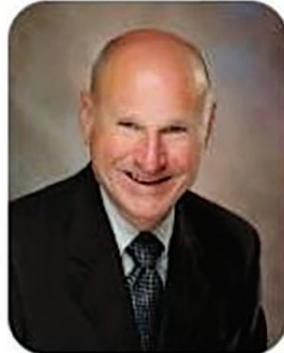
Aerium Therapeutics plans to start testing the combination in humans next month, said Trono, who is among the company's founders. If larger trials eventually confirm its effectiveness, the P5C3/P2G3 combination will be given by injection every three-to-six months to people who are immunocompromised and do not have a strong response to COVID-19 vaccines, the company has said.

Parrish Healthcare to Host Free Community Presentation by Orthopedic Expert Panel

Bone and joint health are essential to maintaining a high quality of life. Join us for an informative evening with our orthopedic panel of experts who will share information about healthy aging, tips and tricks to maintaining an active lifestyle at any age as well as a free risk assessment, live demonstrations, door prizes and more!



Anthony Allotta, DO
Sports Medicine



Johnathan Lubitz, DPM
Podiatry



Bryan Parry, MD
Orthopedics

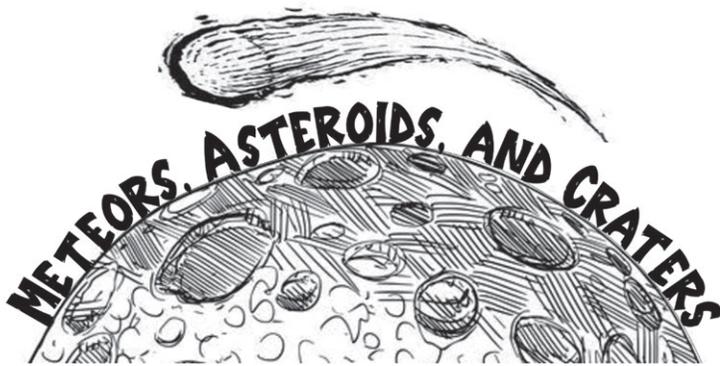


David Schafer, MD
Orthopedics

Everyone is welcome to the Life Moves Orthopedic Panel Discussion featuring Dr. Anthony Allotta, Dr. Johnathan Lubitz, Dr. Bryan Parry and Dr. David Schafer. The event will be held on Wednesday, September 7; 5:30 – 7:15 p.m. at Indian River Preserve, 3950 Clubhouse Dr., Mims, FL

The event is free, but seating is limited. Reserve yours by registering at parrishhealthcare.com/OrthoEvent.

Mad Science Saturdays Presents Meteors, Asteroids, and Craters, Oh MY!



August 13 and 27

Asteroids, Meteors, and Craters, Oh My! Ever wonder how messy space really is? Come join Professor Darin as he does some wild experiments to explain what is really flying around in space and how it affects our own planet. There will be ice balls, smashing rocks, and... flying cocoa?

**American
Space
Museum &
Space Walk of Fame**

The workshop will be offered at 10:00, 12:00, and 2:00 on BOTH Saturday, August 13th and 27th. Be sure to register soon at <https://spacewalkoffame.org/register> to reserve a spot, as class sizes are limited to 12 students per class time.

For more information, please contact the American Space Museum at 321-264-0434. The address of the museum is 308 Pine Street, Titusville. It will be lots of fun, as well as educational and it's FREE.

“Endless Summer” Paintings by Terry Cope

The Downtown Art Gallery, 335 S. Washington Ave., in downtown Titusville is proud to present the paintings of Terry Cope, their Spotlight Artist for the month of August.

Terry is well known for his textured painting of mangroves. With summer in full force, he has turned his attention to surfing. His Endless Summer Series features playful, light filled, surfers shaded by their boards in the bright Florida sun, or confidently riding the waves. His pen and ink sketches whimsically capture surfers in action.

Terry spent his childhood exploring the Merritt Island National Wildlife Refuge and surfing area beaches. For 20 years he lived in South Florida, marketing high quality artist supplies, meeting artists and studying techniques. Returning to his hometown of Titusville, Terry resumed his interest in the local environment. His oil and acrylic paintings depict surfers, mangrove shorelines, sea birds and turtles. Terry is always trying new things and his latest work is a culmination of his experience with different mediums.

Terry's paintings are on view until September 10 at the Downtown Art Gallery, Monday thru Saturday.

For information call 321-268-0122 or view them on Facebook @The Downtown Art Gallery.

Latest on SpaceX's Starship

On July 5, Starship prototype SN24 rolled out, setting off a wave of fevered speculation over whether it could finally embark on its much-teased next test flight and become the first of SpaceX's enormous new rockets to reach orbit. If it does blast off this month, SN24 will be the first Starship prototype launch in more than a year.

Starship prototypes went through five suborbital tests in the spring of 2021. SN8 even managed to stick the landing. Since that high, the engines have fallen silent.

What caused the testing slowdown in the first place? "The thing that's really holding them up is the FAA approval to launch." That's the word from Wendy Whitman Cobb, a professor in space policy at the US Air Force School of Advanced Air and Space Studies. "The regulations have not kept up with the state of the commercial space industry."

Cobb has a point: To launch Starship to orbit, the Federal Aviation Agency required SpaceX to undergo an environmental review. The process has taken over a year, and the agency finally published a list of 75 "mitigations" in June of 2022 that SpaceX must deploy in order to keep launching Starship prototypes. The list includes certain safety stipulations, as well more esoteric measures like requiring the company to make an annual contribution of \$5,000 to a local adopt-an-ocelot program.

The FAA's review has been a point of frustration for SpaceX CEO Elon Musk. According to Cobb, Musk's ire isn't without merit. "They started developing these regulations in the 1980s, and when they did so they were not anticipating anything like SpaceX, let alone the rest of the commercial industry," says Cobb. "The bureaucracy was set up in such a way that they were only anticipating maybe a dozen launches a year using traditional methods and the regulations have not kept up with the state of the commercial space industry today," she explains.

However torturous, the environmental review is important. Not only does it try and protect the local environment, but also previous sub-orbital tests have already demonstrated the risks when launching such large rockets. During one suborbital test launch, SN11, debris from a mid-air explosion landed on a publicly accessible beach — it took months to clean up, according to some reports.



SpaceX Starship spacecraft prototypes and a super heavy booster sit at the company's launch facility in south Texas. - photo courtesy of Getty Images

Orbital launches magnify the risk of failure — something SpaceX is not unaccustomed to at this point. To reach orbit, both the Starship rocket and first stage booster require more liquid methane propellant than SpaceX has ever used before. When they fill the booster fully, there's talk that the exclusion zone — the area they would need to evacuate — will impinge on the southern parts of South Padre Island, where people live. The location of Boca Chica on the South Texas border amplifies the potential problems. An explosion of that size would be an international incident by definition because

the fireball might reach the Mexican border.

Assuming SpaceX ticks all the FAA's boxes, it's expected that the company will be approved for around five orbital flights launching from Boca Chica every year.

But the apparent delay on an orbital test isn't all red tape. The ground system at Boca Chica was scaled only for what they needed for their suborbital test," says Anthony Colangelo, a veteran SpaceX watcher and the host of space industry podcast Main Engine Cut Off. "They did not have the systems capable of doing orbital launches a year ago."

SpaceX has spent the last year building out its capabilities on the ground, constructing extra storage tanks, and the all-important launch tower.

In recent months, SpaceX has also spent considerable resources building a new launch tower at the Kennedy Space Center's historic Launchpad 39A, which launched the Apollo 11 mission to the Moon. Since 2013, SpaceX has held a lease on the Florida site, and it is now being upgraded for Starship launches. They've been building out a Starship launch tower down here. Kennedy Space Center is also better located for launches, as rockets can reach a wider range of different orbits.

"39A might prove a more suitable home for Starship than Boca Chica. 39A has all the environmental stuff cleared for gigantic rockets," says Colangelo. "It wasn't even scaled for the Saturn 5, it was scaled for the thing after the Saturn 5. They built that pad thinking it will be the Mars rocket launch pad," he adds.

Starship's ultimate goal is to ferry humans to Mars by the middle of this century.

What makes the pause in Starship testing particularly

worrying is the white elephant in the room: The Moon. NASA's current roadmap scopes out a 2025 launch for astronauts on the Artemis III mission to the Moon from Kennedy Space Center on board NASA's Space Launch System rocket. But instead of building a new, tiny capsule like the one used by the Apollo program in the 1960s, NASA contracted SpaceX to use Starship as a "Human Landing System" (HLS) that the astronauts will dock with once in lunar orbit. But, can Starship make enough progress in the next three years to meet NASA's deadline?

"The Starship that's going to land on the Moon will launch from Earth, but it will never come back to Earth. It will have landing legs for the Moon," says Colangelo.

Also, not one Starship: Artemis III requires multiple Starships to be in space at one time — not just the HLS, but also Starships that act as fuel tanks for the HLS.

Artemis III depends on more than SpaceX. At this point, he thinks a 2025 Artemis III launch is unlikely.

Back to School

Children in the Brevard County Schools will be returning to school on August 12, 2022. Please watch out for the school buses, stop behind them when they stop with their flashers on, and be prepared to obey the 15 mph school zone signs again.

Port St. John Public Library

6500 Carole Ave., Port St. John
321-633-1867

Mary Lena Penna, Library Director

Library Hours: Monday, Tuesday, Thursday and Friday 9 a.m.-5 p.m.. Wednesday 12-8 p.m. and Saturdays 10 a.m.-2 p.m.

Meeting rooms are available for reservation by calling the library and study rooms are open on a first-come-first-served basis.

Computers are available, and we also offer scanning, wireless printing and faxing.

8/13 & 8/27 10 a.m.-noon: **Pokemon Club of Port St John.** All ages welcome.

8/20 10:30 a.m.: **Cruise talk** with cruise travel writer, Melissa!

Storytimes will be on hiatus at the beginning of August.
8/25 3-4:00 p.m.: **Storytime for Young Readers.** Ages 6-12.

8/26 10:30 a.m.: **Little Listeners storytime.** Ages 2-5.

Book BINGO continues through August for Adults & Teens 12+. See Reference Desk.

Tuesdays, 10-11 a.m.: Humanatee Yoga for Beginners or Intermediate. \$5 Instructor Fee.

All Brevard County libraries will be closed on Monday, September 5th in Observance of Labor Day.

Enchanted Forest Sanctuary

August Events

Nature Storytime

Wednesday, August 10th 10 a.m. to 10:30 a.m.

Geared towards ages 5 years and under, enjoy a half-hour story time at the Enchanted Forest Sanctuary! Theme: Colors in Our Garden! Explore colors in our butterfly garden and how they attract pollinators. Registration required; please call 321-254-5185 to sign up.

Sanctuary School

Wednesday, August 17th 10 a.m. to 10:45 a.m.

Geared towards ages 6 through 12. Theme: Fabulous Flowers! Dissect a flower and learn how pollination happens. Registration required, please call us at 321-264-5185 to sign up.

Garden Workday

Saturday, August 20th 10 a.m. to 12 p.m.

Grab your hat, sunblock, and water, and come help maintain the butterfly garden at the Sanctuary! Registration required. Please call 321-264-5185 to sign up.

Forest Funday

Sunday, August 28th 1 p.m. to 3 p.m.

Join us to learn about flowers and do some fun activities. Registration is not required but if you have any questions, please call us at 321-264-5185.

Tai Chi at the Forest

Every Saturday in August 9:30 a.m. to 10:30 a.m.

Join instructor Kate Perez for a beginner-level class on the porch! Loose-fitting clothing, masks, and a water bottle are recommended. Registration required no later than the day before class. Please call 321-264-5185. Space limited.

Yoga in Nature

Every Sunday in August 9:30 a.m. to 10:30 a.m.

Join local yoga instructors for a traditional class for all levels on the porch! Wear loose-fitting clothing and do not eat anything an hour before class. Bring water and a mat. Registration required no later than the day before class. Please call 321-264-5185. SPACE LIMITED.

Guided Hikes

Openings Every Sunday in August at 10 a.m.

Enjoy a 45-minute guided hike. Please bring a hat, water, and walking shoes. Registration required no later than the day before the hike. Please call 321-264-5185 to sign up. NO SAME-DAY SIGN-UPS.

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