Ode to E Pluribus Unum for Sunday November 13 2022

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Pleiades over Half Dome

Image Credit & Copyright: Dheera Venkatraman

Stars come in bunches. The most famous bunch of stars on the sky is the Pleiades, a bright cluster that can be easily seen with the unaided eye. The Pleiades lies only about 450 light years away, formed about 100 million years ago, and will likely last about another 250 million years.

Our Sun was likely born in a star cluster, but now, being about 4.5 billion years old, its stellar birth companions have long since dispersed.

The Pleiades star cluster is pictured over Half Dome, a famous rock structure in Yosemite National Park in California, USA. The featured image is a composite of 28 foreground exposures and 174 images of the stellar background, all taken from the same location and by the same camera on the same night in October 2019.

After calculating the timing of a future juxtaposition of the Pleiades and Half Dome, the astrophotrographer was unexpectedly rewarded by an electrical blackout, making the background sky unusually dark.

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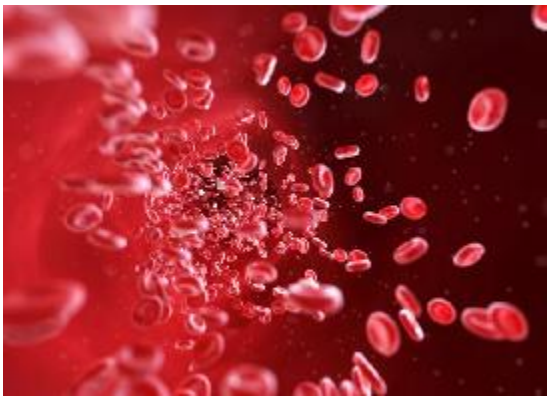
Two People Receive Transfusions of Lab-Grown Blood Cells

By Nicoletta Lanese

A clinical trial will test the viability of lab-grown blood cells for transfusions.



Scientists grew red blood cells in a lab and then transfused them into people.
(Image Credit: Sebastian Kaulitzki/Science Photo Library Via Getty Images)

Two people in the U.K. are the first ever to receive transfusions of lab-grown red blood cells.

The pair are healthy volunteers in the "Recovery and survival of stem cell originated red cells" (RESTORE) trial, a one-of-a-kind clinical trial taking place at Addenbrooke's Hospital in Cambridge. The trial will ultimately include at least 10 participants, each of whom will receive a tiny transfusion of about one to two teaspoons-worth of lab-grown red blood cells, according to a statement(opens in new tab).

The goal of the trial is to compare how well these lab-grown cells survive in the body compared with standard red blood cells from a donor. So each trial participant will receive two mini-transfusions — one with standard cells and one with lab-grown — spaced four months apart. The order of the transfusions will be randomized.

Scientists expect the lab-grown cells to survive longer than standard cells, mostly because standard blood transfusions contain cells of varying ages while lab-grown cells can be made fresh.

https://youtu.be/_Dw4mGy_DJg

"If our trial, the first such in the world, is successful, it will mean that patients who currently require regular long-term blood transfusions will need fewer transfusions in future, helping transform their care," chief investigator Dr. Cédric Ghevaert(opens in new tab), a professor in transfusion medicine and consultant hematologist at the University of Cambridge and National Health Service Blood and Transplant (NHSBT), said in the statement.

People who require regular blood transfusions, such as those with sickle cell anemia, face a risk of "iron overload," in which excess iron accumulates in the body and damages organs, according to the medical database StatPearls(opens in new tab). In addition, repeat transfusion patients can also develop antibodies that target specific

These antigens distinguish the different blood groups, including the major groups — A, B, AB and O — and the lesser-known minor groups that are challenging to match between blood donors and recipients. When transfusion patients develop antibodies against specific blood groups, this puts them at risk of life-threatening immune reactions and therefore limits the types of blood they can receive in the future, according to a 2018 report in the journal Blood(opens in new tab).

"This world leading research lays the groundwork for the manufacture of red blood cells that can safely be used to transfuse people with disorders like sickle cell," Dr. Farrukh Shah(opens in new tab), the medical director of transfusion for NHSBT, said in the statement. Ideally, the work will not only reduce the number of transfusions such patients need, but also allow medical researchers to grow rare blood cells in the lab.

"The need for normal blood donations to provide the vast majority of blood will remain," Shah said. "But the potential for this work to benefit hard to transfuse patients is very significant."

For the new trial, scientists extracted stem cells from blood donated by adult volunteers and allowed those cells to mature in lab dishes. The stem cells were "hematopoietic," meaning they could only mature into red blood cells, white blood cells and platelets.

The team then ran the mature cells through a filter normally used to remove white blood cells from standard blood donations, CNBC reported(opens in new tab). Finally, they tagged the purified red blood cells with a radioactive marker, so that they could track the cells in the body post-transfusion.

So far, "no untoward side effects were reported" in the two trial participants, according to the statement. After the trial concludes, more research will still be needed before lab-grown blood cells can be widely used. "But this research marks a significant step in using lab grown red blood cells to improve treatment for patients with rare blood types or people with complex transfusion needs," the statement reads.

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Why Flying a Frogfoot Over the Ukraine is Risky Business

From The Aviationist.

https://youtu.be/qkT7Q5EHOAc

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Evolution of Vision and the Eye

https://www.visualcapitalist.com/eye-evolution/?utm_source=join1440&utm_medium=email&utm_placement=newsletter'

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Witness Moths Taking Flight at 6,000 Frames Per Second

'Whose day isn't gonna be better after watching a pink and yellow rosy maple moth fly in super-slow motion?'

https://youtu.be/JQL25_hoQ1k?t=1

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Impressive Owl Camouflage on Display

https://mossandfog.com/impressive-owl-camouflage-on-display-can-you-spot-them/?utm_source=join1440&utm_medium=email&utm_placement=newsletter

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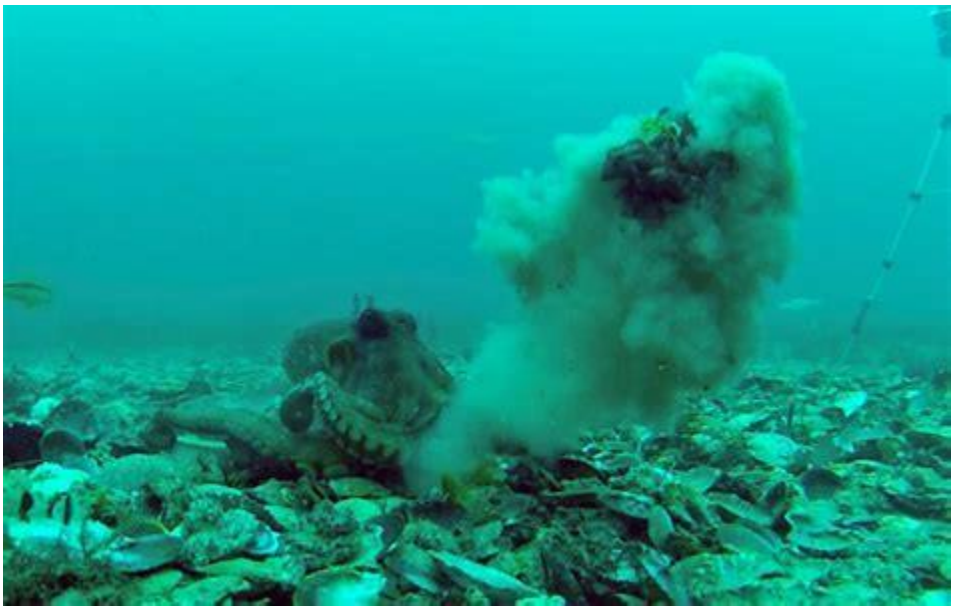
Octopuses Caught on Camera Throwing Things aAt Each Other

Cephalopods living unusually close together have been filmed throwing shells, algae and silt — sometimes at another octopus.



https://www.nature.com/articles/d41586-022-03592-w?utm_source=join1440&utm_medium=email&utm_placement=newsletter

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Springtails Are Nature's Tiny Gymnasts, Videos Reveal

The insect-like creatures that leap through the air with remarkable control might inspire new jumping robots

https://www.smithsonianmag.com/smart-news/springtails-are-natures-tiny-gymnasts-videos-reveal-180981094/

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Disturbing Assessment of Pilot Emotional Intelligence

http://bit.ly/3TpgkZS

Is this valid? I think it's hogwash, but if so I seem to have missed the boat.

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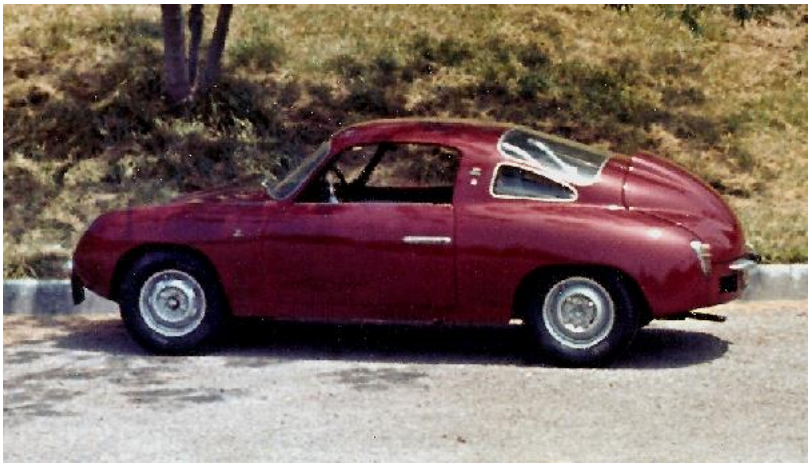
Fiat Abarth 1000 Twin Cam



https://bringatrailer.com/listing/1961-fiat-abarth/?utm_source=dm&utm_medium=email&utm_campaign=2022-11-11

Mine was stolen while I was in Vietnam in 1970. A true 'Thank you for your service,' don't you think?

Along with being a weekend racer, it was my daily driver for six years…85k miles and able to deliver 50+ mpg at 80 mph. Years later I owned its double-bubble cousin, but it was nowhere near the same car.

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Heinz Spent 185,000 Hours Redesigning its Ketchup Bottle Cap

After 45 iterations, this Heinz bottle cap will be fully recyclable.

[Image: Heinz]

By Adele Peters

In Heinz's squeezable upside-down ketchup bottle, the plastic cap is designed to dispense a standard blob of sauce without spilling. It works. But it can't easily be recycled, so the Kraft Heinz Company decided to design an alternative. Nine years later—after 185,000 hours of product development, $1.2 million in investment, and 45 different iterations—a new design will be rolling out in the U.K. within the next couple of months.

The original cap used a flexible silicone valve, something that was "very difficult to recycle," says Jonah Smith, global head of ESG at Kraft Heinz. "It's possible, it's just more difficult." Recycling facilities would have to be able to separate the silicone from the rest of the cap—something not terribly cost effective for a tiny scrap of material—and then they'd need somewhere to send it. In the U.S., there's only one silicone recycling plant. (And considering an explosion that happened there last summer after an unexpected reaction, it isn't clear how viable that plant's process is.)

The team looked for a solution that could "still provide that exact proportion and the right amount, and protect the product, obviously," Smith says. "And at the same time, make it easier for [recycling facilities] to recycle the material." It wasn't a simple problem. After trying to find a solution with external partners, the company brought it back to an internal R&D team, who eventually started experimenting with a 3D printer.

They first tried to make an insert, and then realized they'd need to redesign the whole cap. "The biggest challenges were getting to similar performance of the current closure, addressing the challenges of the current one, and meeting our consumers' needs . . . which led to the 45 iterations," says Kim Bertens-Vlems, an international senior packaging manager at Kraft Heinz based in the Netherlands. "Changing some of the aspects affected the other criteria, therefore getting the balance right was the main challenge."

The final design is made from a single material, polypropylene, with two parts that make "an indirect exit for the product to be dispensed" when the bottle is squeezed, Bertens-Vlems says. When someone lets go, the air rushes back in. It creates a "controlled dose," and because it's one material, it easily can be recycled with other things made from polypropylene, like yogurt cups. The same approach could be adapted for caps for other types of products, including shampoo, and Smith says that the company is interested in potentially sharing the design with competitors. The caps will launch first in the U.K. and Europe, with no announcement yet about a global rollout.

The lengthy redesign process is one example of just how hard it is to shift from the status quo of the packaging world, where it's still common for packages to be made from multiple materials or otherwise difficult to recycle. And the new design itself doesn't fully solve the problem—both recycling facilities and consumers need to learn that the new caps are now recyclable, and consumers have to actually take the step to put them in the right bin. In the U.S., even widely recyclable soda and water bottles often end up in landfills (the same is undoubtedly true for plastic ketchup bottles; Kraft's is made from PET, the same type of plastic as a water bottle). Just because something is recyclable, doesn't mean that it gets recycled.

While other packaging alternatives exist, Smith says they all come with tradeoffs. Glass bottles, for example, have a larger carbon footprint than plastic during transportation, because they're heavier. (Also, the recycling rate for glass in the U.S. is abysmally low.) The company is still experimenting with other solutions, including a paper bottle that could potentially be used with the new cap. The ideal solution, perhaps, may be the hardest to adopt—reuse. If you go to some Kroger stores in Portland, Oregon, it's possible to buy Heinz ketchup through the Loop platform, where packaging can be returned after use, cleaned, refilled, and then put back on the shelf, repeatedly. But it comes in an old-fashioned glass bottle, and some consumers may still want something squeezable. And if it's hard to get consumers to widely use recycling bins, it may be even harder to get them to bring them back to the store.

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When the game is over, regardless of the outcome, the king, the queen and the pawns are all returned to the same box.

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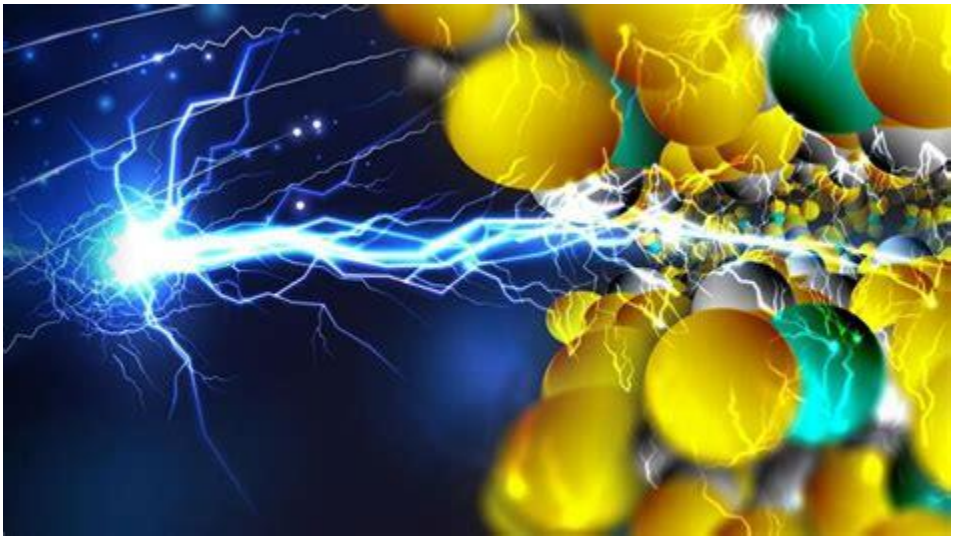
Material Made of Plastic that Can Conduct Like Metal



newsrnd.com

https://mail.google.com/mail/u/0/?shva=1#inbox/FMfcgzGqRGfPwWHvHbVShhctKzltnnGW?projector=1&messagePartId=0.1

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Next Steps to Return Mars Samples to Earth

Multiple robots that would team up to ferry to Earth samples of rock and soil collected from the Martian surface by NASA's Mars Perseverance rover.
Credit: NASA/ESA/JPL-Caltech

http://bit.ly/3Eq122

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New Entanglement Results Hint at Better Quantum Codes

A team of physicists has entangled three photons over a considerable distance, which could lead to more powerful quantum cryptography.

https://www.quantamagazine.org/new-entanglement-results-hint-at-better-quantum-codes-20221024/?mc_cid=256dd327cd&mc_eid=636bc88d2e

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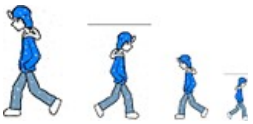
My Walking Thoughts



For Sunday October 23 2022

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Breaking Barriers: Peer Outreach Boosts Student Veterans

https://news.cornell.edu/stories/2022/11/breaking-barriers-peer-outreach-boosts-student-veterans

Lately, I've become uniquely aware of the difficulties veterans face in reestablishing their lives in what is for the most part an unwelcoming society. Forget all that 'thank you for your service' greetings and recognize that today's veteran who six years ago traded membership in a tribe composed principally of schoolmates for one based on the sterner stuff of duty, obligation, and survival, now finds himself faced with fitting back in with people who have moved forward in civilian pursuits.

There are no simple answers for drawing veterans back into a society that has undergone significant changes during their absence. Institutions such as family, religion, basic concern for justice and fairness have given way to…well you know today's world probably better than I, so you can assess the challenges these 24-year-old outsiders face as they move from a very tightly bound tribe to a world filled with people fixated on their own concerns.

Last Thursday was the US Marine Corps' 247th birthday. Friday--Veterans' Day--marked the 104th anniversary of the end of World War 1…the eleventh hour of the 11th day of the 11th month in 1918.

Of all the things I read this week, the accompanying article offered not so much a solution as an opportunity for today's returning vets to gain a foothold in the mainstream of American life.

While the advantage of continuing education is certainly there, the true value may not be so much one of scholarship or the achievement of a white-collar work permit, but a handshake to those who have shared more of themselves than most of us will ever know.

[While I'm at it, I will root my use of the masculine personal pronoun in the simple fact that currently 99% of veterans are male. When by the end of this decade the percentage of female veterans may rise to 2%, I'll be gone and won't need to worry about explaining myself.]

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