CHEMWATCH

BULLETIN

Week of 29 May 2026

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GOSSIP

Study Warns Widely Used Food Preservatives Linked to High Blood Pressure and Heart Disease

Sci Tech Daily · 27 May 2026

Common preservatives used in processed foods may increase the risk of high blood pressure and cardiovascular disease , according to a study of more than 112,000 people.

For decades, food preservatives have helped keep supermarket shelves stocked and extend the life of everything from packaged bread to processed meats.

But new research suggests some of these widely used additives may come with an unexpected tradeoff: a higher risk of high blood pressure and cardiovascular disease.

The study was led by Dr. Mathilde Touvier, research director at INSERM (the French National Institute for Health and Medical Research), and Anaïs Hasenböhler, a PhD student. Both are part of the Nutritional Epidemiology Research Team at Université Sorbonne Paris Nord and Université Paris Cité in France.

Ms. Hasenböhler said, “Food preservatives are used in hundreds of thousands of industrially processed foods. Experimental studies suggest that some preservative food additives may be harmful to cardiovascular health, but we have not had enough evidence on the impact of these ingredients in humans. As far as we know, this is the first study of its kind to investigate the links between a wide range of preservatives and cardiovascular health.”

The research was conducted as part of the larger NutriNet-Santé study and involved 112,395 volunteers across France. Every six months, participants reported everything they ate and drank during a three-day period.

Researchers closely examined the ingredients in all foods and beverages consumed, including preservative additives. Participants’ health was then monitored for an average of seven to eight years to identify cases of high blood pressure and cardiovascular disease.

The team found that 99.5% of volunteers had consumed at least one food preservative during their first two years in the study.

Participants with the highest intake of “non-antioxidant” preservatives had a 29% greater risk of hypertension compared with those consuming the least. They also had a 16% higher risk of cardiovascular disease, including heart attack, stroke, and angina.

People who consumed the most antioxidant preservatives showed a 22% higher risk of hypertension. Non-antioxidant preservatives are used to prevent the growth of harmful microbes such as mold and bacteria. Antioxidant preservatives help stop oxidation that can cause foods to brown or become rancid.

Researchers also analyzed 17 commonly consumed preservatives and found that eight were specifically associated with high blood pressure. These included potassium sorbate (E202), potassium metabisulphite (E224), sodium nitrite (E250), ascorbic acid (E300), sodium ascorbate (E301), sodium erythorbate...

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This new aluminum could replace rare metals and cut costs dramatically

Science Daily · 16 Mar 2026

A team of scientists at King's College London has identified a new form of aluminum, one of the most abundant metals on Earth, that could offer a far less expensive and more sustainable alternative to widely used rare earth metals.

Led by Dr. Clare Bakewell, a Senior Lecturer in the Department of Chemistry, the researchers created highly reactive aluminum molecules capable of breaking some of the strongest chemical bonds. Their findings, published in Nature Communications , also reveal entirely new molecular structures, opening the door to previously unknown types of chemical behavior.

The researchers reported the first known example of a cyclotrialumane, a compound made of three aluminum atoms arranged in a trimeric -- triangular -- structure. This unusual configuration shows remarkable reactivity. Importantly, the structure remains intact even when dissolved in different solutions, giving it the stability needed for a variety of chemical reactions.

These reactions include splitting dihydrogen and enabling the step-by-step insertion and chain growth of ethene, a simple 2-carbon hydrocarbon. Such capabilities highlight the compound's potential for building more complex molecules.

Metals play a central role in producing both everyday and specialized chemicals used across industry. Many of these processes rely on precious metals like platinum, which are costly and can have significant environmental impacts due to extraction.

Scientists have been searching for alternatives that are easier to obtain and more sustainable. Dr. Clare Bakewell explained: "Transition metals are the workhorses of chemical synthesis and catalysis -- but many of the most useful are becoming increasingly difficult to access and extract -- often being located in regions of political instability, increasing the demand and price.

"Chemists have been looking towards more common elements from the periodic table, and we chose aluminum, as it's super abundant, making it ~20,000 times less expensive than precious metals such as platinum and palladium."

Expanding the Possibilities of Aluminum Chemistry

In addition to designing aluminum compounds for use in chemical synthesis, the team is uncovering entirely new reactions.

Dr. Bakewell said, "What's special about this work, is that we're pushing the boundaries of chemical knowledge. Most excitingly, we can use this aluminum trimer to build completely new compounds with levels of reactivity that have never been observed before -- these include the 5- and 7-membered aluminum and carbon rings formed through reaction with ethene. These capabilities go beyond the transition metals we were originally trying to mimic, to the forefront of...

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Scientists turn CO2 into fuel using breakthrough single-atom catalyst

Science Daily · 17 Apr 2026

Every chemical reaction must overcome an energy hurdle before it can occur. Substances need an initial input of energy to start reacting. Sometimes this barrier is small, like lighting a match. In many industrial processes, however, the required energy is much higher, which increases costs.

To make reactions easier and more efficient, chemists rely on substances called catalysts. These "reaction helpers" reduce the energy needed. The most effective catalysts often contain metals, including rare and expensive ones.

Breakthrough Catalyst Turns CO 2 Into Methanol

Researchers at ETH Zurich have now made a major advance in catalyst design. Their new system significantly lowers the energy needed to produce methanol (an alcohol) from carbon dioxide and hydrogen.

The team also achieved an unusually efficient use of the metal indium. In this catalyst, each individual indium atom acts as its own active site. This is a major shift from traditional approaches, where metals are grouped in particles.

Another key advantage is improved precision. In the past, catalyst development often relied on trial and error. This new design allows scientists to better observe and understand the reactions happening on the surface, opening the door to more deliberate and optimized catalyst development.

"Methanol is a universal precursor for the production of a wide range of chemicals and materials, such as plastics -- the Swiss army knife of chemistry, so to speak," says Javier Pérez-Ramírez, Professor of Catalysis Engineering at ETH Zurich.

Methanol is essential for producing fuels and materials, and it plays a growing role in efforts to move away from fossil fuels. If the hydrogen and energy used in the process come from renewable sources, methanol production could become climate neutral.

This approach also offers a new way to use CO 2 . Instead of releasing it into the atmosphere, it can be captured and turned into a valuable raw material.

Single Atom Catalysts Maximize Efficiency

"Our new catalyst has a single atom architecture, in which isolated active metal atoms are anchored on the surface of a specially developed support material," Pérez-Ramírez explains.

In conventional catalysts, metals are typically grouped into small particles that can contain hundreds or even thousands of atoms. Many of those atoms are not directly involved in the reaction, making the process less efficient.

Single atom catalysts represent a more efficient alternative. By using metals at the level of individual atoms, scientists can make better use of scarce and costly...

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25 years ago click chemistry changed science. What happened next?

Chemistry World · 28 May 2026

How the concept of click has become a transformational tool for science

Barry Sharpless and his team first popularised the concept of ‘clicking’ two molecules together back in 2001 – 25 years ago this month. The review paper that launched a new field has now been cited almost 20,000 times, making it one of the most influential chemistry papers ever written. And in 2022, Sharpless, along with Morten Meldal and Carolyn Bertozzi, won the Nobel prize in chemistry for establishing the field of click and bioorthogonal chemistry . But what are click reactions and what might the next 25 years of this field look like?

Taking inspiration from how nature can combine small building blocks, Sharpless’s team first described a handful of ‘spring-loaded’ synthetic reactions that ‘click’ two molecules together in 2001. ‘[The name] was meant to call back that feeling that one gets when you snap together the two halves of a luggage strap – that satisfying click,’ says M G Finn at Georgia Tech in the US. Finn helped develop the click concept with Sharpless and Hartmuth Kolb at the Scripps Research Institute, US, leading to the seminal paper that established the field .

The paper that started it all. Click chemistry is now widely used, but the concept was met with some scepticism at the time.

The team explained that such reactions must be modular, wide in scope, high-yielding and able to take place without a solvent or benign solvents such as water. Click reactions also had to be stereospecific and selective without the need to isolate the product using chromatography, as well as thermodynamically favourable.

The reaction between an azide and an alkyne (catalysed by copper) is the best known example of the click chemistry concept.

Copper-catalysed cycloadditions between azides and alkynes to form triazole rings are the most well-known example of a click reaction. Sharpless’s team described this as the ‘cream of the crop’. However, other reactions fall under the umbrella of click reactions, including nucleophilic ring-openings of strained heterocycles such as epoxides and oxidative additions to carbon–carbon multiple bonds.

‘The idea of click chemistry has empowered non-organic chemists to be able to think about making new molecules,’ says Finn. ‘It allows biologists, material scientists [and others] to make bonds where they might not have thought that they could do that before,’ he says. ‘We sometimes refer to this as the democratisation of chemical synthesis.’...

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Fusing silk gives it Kevlar-like strength for next-gen implants

New Atlas · 25 May 2026

Silk isn't just great as a smooth fabric for luxurious clothing: it's finding a wide range of uses in everything from edible food-preserving wrappers to skin-friendly wearable health monitoring sensors . There's plenty of scope to enhance its characteristics too , and a simple new approach has allowed it to get about as tough as Kevlar.

Silk fibers are typically harvested and dissolved before they're turned into other forms for the aforementioned applications. A group of researchers from Tufts University, Imperial College London, and the University of Michigan went a different way: fusing the fibers together under precisely controlled heat and pressure.

By aligning the fibers in a single direction and then processing it in this way, you get a remarkably strong and tough solid bio-derived material. You can even control the structure depending on its target application by applying more or less heat and pressure, as the team noted in its paper that appeared in Nature Sustainability this month .

Silk fibers are first treated to remove the sticky sericin that enables insects to build cocoons. They're then hot-pressed at temperatures between 257-419 ºF (125-215 ºC) and pressures between 1,900-9,800 atmospheres, during which the amorphous phase of the fiber proteins enable the fibers to strongly fuse together.

The bond between these fibers transfers stress between them, making the fused material much stronger than before, similar to wood or carbon-fiber composites.

This fused silk has numerous properties that open it up to a wide range of applications. It can withstand ballistic impact – demonstrating toughness similar to that of Kevlar. It's transparent to visible light, and it's biocompatible.

Tufts research assistant professor Chunmei Li noted that, "because of its strength, it could potentially be used for fixation devices like plates, pins, and screws as supports for bone fractures." Tuning the processing conditions could also produce platforms for softer and more flexible implants.

It can also polarize terahertz radiation , and the team believes this material could be deployed in next-gen communication systems like 6G networks that will quickly transmit high volumes of encoded information.

Lastly, this approach to treating silk could allow for upcycling used textiles, which previously would have to be dissolved before processing, or simply discarded.

The researchers' next steps involve exploring ways to scale up production of this material, and exploring its role in sensing technologies.

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Near-zero cement takes a huge bite out of emissions

New Atlas · 26 May 2026

Cement has been a vital building block (pun intended) in constructing civilization. However, its manufacturing process has also made it a wrecking ball on the environment, with a carbon footprint that rivals that of the aviation industry. Scientists from the University of British Columbia have devised a method that dramatically cuts cement’s carbon footprint using electricity.

Their process, outlined in ACS Energy Letters , significantly lowers the extreme heating requirements of cement manufacturing by incorporating a preheating electrochemical conversion step. Their approach also utilizes recycled cement and concrete to achieve an even lower carbon footprint.

Cement is one of the world's most widely used industrial materials. Humanity produces roughly 4 billion tons of it every year, mixing the fine powder with water, sand, and aggregates like gravel to create concrete and mortar used in buildings, bridges, roads, tunnels, dams, and countless other forms of infrastructure. In fact, much of modern civilization is quite literally built on it.

Cement's ubiquity stems from the remarkable durability and compressive strength it provides to structures, allowing them to last for decades or even centuries. Unfortunately, the material also sits at the center of one of the planet's biggest industrial climate problems. Cement production is estimated to account for roughly 8% of global CO_2 emissions, more than the entire aviation industry.

The bulk of the problem lies not with the finished cement itself but with its manufacturing process.

Modern cement production begins primarily with limestone (calcium carbonate, $CaCO_3$) and silica-rich minerals such as clay or sand. These raw materials are fed into giant rotary kilns and heated to temperatures approaching 2600 °F (1450 °C), partially melting and chemically transforming the mixture into hardened nodules known as clinker: the intermediate material later ground into the fine powder we recognize as cement. Clinker consists predominantly of calcium silicate minerals known as alite and belite, compounds largely responsible for cement's strength and hardening behavior.

Now, this process has a two-fold problem that generates emissions in two separate ways.

First, maintaining kiln temperatures hot enough to partially melt rock requires enormous amounts of energy, traditionally supplied by burning coal, petroleum coke, or natural gas. Cement kilns are among the most energy-intensive industrial systems on Earth.

Second, and more importantly, the chemistry itself directly releases carbon dioxide. As limestone is heated, it undergoes thermal decomposition in a reaction known as calcination, breaking apart into calcium oxide and CO_2 gas. This...

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Climate change driving extreme acidification of North American streams that threatens life in them

Chemistry World · 27 May 2026

As climate change drives thawing of permafrost it can lead to highly acidic water that leaches 'catastrophic' levels of toxic metals from rocks into pristine streams, researchers in Canada have shown. The result has been a decline in vegetation over decades that appears to be accelerating recently.

Buried sulfides that originally formed in oxygen-depleted environments on Earth are widespread in permafrost. When the permafrost begins to melt, oxygen or water can oxidise them to sulfates. This then leads to runoff containing sulfuric acid, which can leach metal ions from rocks.

In the new work, environmental geochemist Ellio t t Skierszkan at Carleton University in Canada and colleagues studied the effects on the Yukon and Mackenzie river basins in North America. Their results showed increasing acidification of rivers from permafrost meltwater to a level that would be painful to skin. 'We typically mine metal sulfides – they're a great source of metals for economic use. We break apart the rock and we expose those sulfide minerals to oxygen and to water, and create acid mine drainage,' says Skierszkan. 'You get pH2–3 water coming out of sulfide-rich mine tailings if there are no carbonates present in the mine waste. Here we're seeing the exact same chemical

reactions happening in a “natural” setting, so instead of being concentrated by mining, their chemical reactivity is being amplified by a transition to unfrozen conditions.’ At this pH, he says, almost no organisms can live, and the concentrations of metals such as cadmium, nickel and zinc are thousands of times higher than the safety limits for most living organisms. ‘It’s quite clear that this water is going to be catastrophic from an environmental standpoint,’ he concludes.

The researchers’ own data, which go back to 2019, show a ‘precipitous decline in water quality’ after 2023. Detailed measurements of various metal ions in specific streams are unavailable from earlier studies, but Skierszkan says that other data from older studies – including remote sensing images of vegetation dieback around rivers – paint a consistent picture of declining water quality since around 2015. ‘There have been recent publications showing it’s an issue happening in Alaska, happening in the Alps, happening in the Andes – all over the world where there are either glaciers that are melting or permafrost that is thawing and where the geology contains these sulfide minerals.’

Aquatic biogeochemist Rose Cory at the University of Michigan in the...

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Scientists Identify Hidden Brain Pathway Behind GLP-1 Weight-Loss Effects

Sci Tech Daily · 27 May 2026

A new study shows oral GLP-1 drugs suppress hedonic eating through a deep-brain reward circuit linked to dopamine release, potentially extending their use beyond weight loss.

Why do GLP-1 weight-loss drugs seem to quiet cravings in ways that go beyond simple appetite suppression? A new NIH-funded study suggests the answer may lie deep within the brain’s reward circuitry, where next-generation oral GLP-1 drugs appear to dampen “hedonic feeding” — eating motivated by pleasure rather than hunger.

The findings offer new insight into why these medications may influence compulsive behaviors more broadly, raising the possibility that they could eventually help treat conditions tied to addiction and reward processing.

Researchers at the University of Virginia investigated small-molecule GLP-1 receptor agonists, including the Food and Drug Administration (FDA)-approved drug orforglipron. Unlike widely used injectable GLP-1 therapies such as semaglutide, these newer compounds can be taken as pills and are less costly to manufacture, potentially making the rapidly growing class of medications more accessible to patients.

“As the accessibility of these medications continues to rise and patient uptake increases, it’s crucial that we understand the neural mechanisms underlying the effects we’re seeing,” said Lorenzo Leggio, M.D., Ph.D., Clinical Director of NIH’s National Institute on Drug Abuse (NIDA).

Earlier studies have largely focused on larger peptide-based GLP-1 drugs such as semaglutide. Those medications are known to reduce hunger-related eating by acting on regions of the hypothalamus and hindbrain. However, researchers have known far less about how smaller oral GLP-1 drugs affect the brain.

To investigate further, scientists used gene-editing methods to alter GLP-1 receptors in mice so they more closely resembled human receptors.

The researchers then gave the mice orforglipron or another small-molecule GLP-1 drug called danuglipron and mapped the brain regions activated by the treatments. In addition to affecting areas already linked to appetite control, the drugs also activated the central amygdala, a brain region tied to desire and reward that scientists did not previously believe GLP-1 drugs could directly access.

Additional experiments found that activation of the central amygdala lowered dopamine release in major parts of the brain's reward system during hedonic feeding.

"We've known that GLP-1 drugs suppress feeding behavior driven by energy demand. Now it seems oral small-molecule GLP-1s also dial back eating for pleasure by engaging a brain reward circuit," said co-corresponding author Ali Guler, Ph.D, a professor of biology at the University of Virginia.

Researchers say the next step...

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Scientists discover a mysterious silicone pollutant that may be everywhere

Science Daily · 23 Mar 2026

Scientists have identified surprisingly high levels of a little-known silicone pollutant in the atmosphere, raising new questions about possible risks to human health and the climate. The chemicals, known as methylsiloxanes, are commonly used in cosmetics, industrial products, transportation, and household items. Researchers found these compounds across a wide range of environments, from major cities to rural villages and forests.

The study was led by researchers from Utrecht University and the University of Groningen and published in the journal Atmospheric Chemistry and Physics .

Hidden Silicone Pollution Found Worldwide

Pollutants such as PFAS and microplastics are already known for their widespread presence in the environment. But methylsiloxanes, a class of water-repelling silicone compounds often used as lubricants, have received far less attention.

For years, scientists believed the methylsiloxanes detected in the atmosphere mainly came from evaporation from personal care products and industrial materials. More recently, however, researchers discovered that ships and motor vehicles release a different form of methylsiloxanes made up of much larger molecules that do not easily evaporate.

The new research shows these larger methylsiloxanes are not limited to traffic-heavy locations. Scientists detected them in urban, coastal, rural, and forest environments, suggesting the chemicals are widespread in the atmosphere.

"The findings also suggest that concentrations of methylsiloxane in the atmosphere are much higher than expected," says Rupert Holzinger, associate professor at Utrecht University who co-supervised the study.

According to the researchers, these large molecular methylsiloxanes account for between 2 and 4.3 percent of the total mass of organic aerosols in the atmosphere, making them among the most abundant synthetic compounds detected in airborne particles. By comparison, atmospheric concentrations of PFAS are typically more than a thousand times lower.

Methylsiloxanes added to lubricants are intended to assist with lubrication rather than combustion. However, during engine operation, moving parts such as pistons require constant lubrication, making it unavoidable that small amounts of engine oil enter the combustion chamber.

Because methylsiloxanes are highly heat resistant and do not fully break down during combustion, some survive the intense temperatures inside engines and are released into the atmosphere through exhaust gases.

The highest concentrations were measured in urban regions. Samples collected in the São Paolo metropolitan area in Brazil reached 98 nanograms per cubic meter. The lowest levels appeared in forest locations, including Rugsteliskis, Lithuania, where concentrations measured 0.9 nanograms per cubic meter.

Researchers also collected air samples in Cabauw, a small rural...

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Quantum entanglement provides a new framework for understanding chemical bonding

Phys Org · 28 May 2026

by Ludwig Maximilian University of Munich

Chemical bonding is one of the central organizing principles of the microscopic world. It determines how atoms combine and thereby governs a wide range of physical and chemical properties of quantum systems across many length scales, ranging from small molecules and biomolecules to macroscopically large solid materials.

Yet, despite its fundamental importance and its prominent role already in high school science education, chemical bonds remain surprisingly elusive from the perspective of quantum mechanics. They are indispensable for describing matter, even though they are not directly observable quantities.

In a recent article published in Nature Communications , the group led by LMU physicist Christian Schilling and member of the MCQST Cluster of Excellence, addresses this long-standing challenge using concepts from quantum information theory.

Building on their expertise in orbital entanglement in quantum chemistry, Christian Schilling and his Ph.D. student Lexin Ding, now an ETH Fellow at ETH Zurich, together with collaborator Eduard Matito from the Donostia International Physics Center in Spain, developed a new framework for understanding chemical bonding through quantum entanglement.

The researchers introduced the notion of maximally entangled atomic orbitals (MEAOs), whose entanglement patterns reveal the bonding structures of molecules in a natural and systematic way.

Remarkably, the framework captures not only conventional two-center bonds described by Lewis structures, but also more complex bonding phenomena including multicenter bonding, aromatic systems such as benzene, and transient bonding patterns emerging during chemical reactions. Such diverse bonding scenarios can now be described within a single unified and fully ab initio framework.

The work reveals a deep connection between chemical bonding and quantum entanglement and establishes a unified and quantitative language for describing bonding phenomena. "In the future, the framework could become a powerful tool for studying complex molecular systems, chemical reactions, and unconventional bonding mechanisms for which traditional approaches often fail," says Schilling.

Lexin Ding et al, Chemical bonding concepts emerge naturally from maximally entangled atomic orbitals, Nature Communications (2026). DOI: 10.1038/s41467-026-73527-w

Provided by Ludwig Maximilian University of Munich

BA art history, MA material culture. Former museum editor, paramedic, and transplant coordinator. Editing for Science X since 2021. Full profile →

Bachelor's in mathematical biology, Master's in creative writing. Well-traveled with unique perspectives on science and language. Full profile →

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CURIOSITIES

New Drug Offers 'Functional Cure' For Dangerous Liver Virus

sciencealert.com · 29 May 2026

WASHINGTON (AP) – A first-of-its-kind drug for hepatitis B is letting some patients stop treatment without showing signs of the dangerous liver virus , what's called a "functional cure," researchers reported Thursday.

In two international studies, about 1 in 5 patients given the experimental drug saw their virus reduced to levels low enough for the immune system to keep in check.

"We have not had a treatment which has come to this level of cure," Dr. Seng Gee Lim of the National University Health System of Singapore, who helped lead the GSK-funded studies, told reporters before presenting the findings at a scientific meeting in Barcelona, Spain.

The data also was published Thursday in the New England Journal of Medicine .

Chronic hepatitis B can cause liver cancer or liver failure , and kills about 1.1 million people around the world each year.

Improvements to today's lifelong therapy, which can be hard to stick with or to access in some countries, have been sought for decades.

The new findings "represent a major step," Dr. Anna Lok, a hepatitis expert at the University of Michigan who wasn't involved in the research, wrote in the journal .

But she cautioned that more study is needed to see how long that remission-like state lasts.

The drug is bepirovirsen, nicknamed "bepi" and developed by GSK and Ionis Pharmaceuticals. It is under fast-track review by the U.S. Food and Drug Administration, with a decision expected in October.

Regulators in Japan, China and Europe also are considering the drug.

Hepatitis B is a serious liver infection spread through contact with blood or other bodily fluids, including childbirth. A highly effective vaccine can prevent it.

For people who are infected, many have an "acute" illness that lasts several months. But for some – about 1.7 million people in the U.S. and more than 250 million worldwide – it becomes a chronic form that gradually damages the liver.

Standard treatments, including daily pills, reduce levels of the virus and prevent liver damage.

But a true cure is elusive because hepatitis B has an unusual ability to hide in the body, ready to rebound if therapy stops.

The new drug attacks hepatitis B by binding to its genetic components, suppressing viral replication as well as a key protein, the "S" or surface protein, and stimulates the immune system, said GSK vice president Melanie Paff.

The trials included 1,838 patients assigned...

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Ancient lost ocean may have built Central Asia's dinosaur-era mountains

Science Daily · 27 Jan 2026

A new study from Adelaide University suggests that the ancient Tethys Ocean played a major role in shaping Central Asia's landscape during the Cretaceous period, long before the rise of the Himalayas.

The research team reached this conclusion through a large-scale data analysis that combined hundreds of thermal history models collected from more than 30 years of geological studies across Central Asia.

Scientists have often linked the region's landscape to a combination of tectonic activity, climate changes, and processes deep within Earth's mantle over the past 250 million years. However, the new findings point to a different dominant force.

"We found that climate change and mantle processes had only little influence on the Central Asian landscape, which persisted in an arid climate for much of the last 250 million years," said Dr. Sam Boone, who was a post-doctoral researcher at Adelaide University when the research was conducted.

"Instead, the dynamics of the distant Tethys Ocean can directly be correlated with short-lived periods of mountain building in Central Asia."

How a Lost Ocean Influenced Mountain Building

The Tethys Ocean once stretched across a vast area of the planet before gradually disappearing during the Meso-Cenozoic period, which covers the last 250 million years. Today, the Mediterranean Sea is considered the final remnant of that ancient ocean.

"The present-day relief of Central Asia was largely built by the India-Eurasia collision and ongoing convergence," said co-author Associate Professor Stijn Glorie, from Adelaide University's School of Physics, Chemistry and Earth Sciences.

"However, during the Cretaceous periods, dinosaurs would have seen a mountainous landscape as well, similar to the present-day Basin-and-Range Province in the western USA.

"It is thought that the extension in the Tethys, due to roll-back of subducting slabs of ocean crust, reactivated old suture zones into a series of roughly parallel ridges in Central Asia, up to thousands of kilometers away from the Himalaya collision zone."

According to the researchers, geological activity connected to the ancient ocean may have triggered mountain formation far from the actual plate boundaries.

Thermal History Models Reveal Earth's Past

The study relied on thermal history models, which help scientists trace how rocks cooled as they moved closer to Earth's surface during periods of mountain uplift and erosion.

"These models were constructed using thermochronology methods and reveal how rocks cooled down when they are brought towards the surface during mountain uplift and subsequent erosion," Associate Professor Glorie said.

"We...

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Scientists discover tiny gut particles that may drive aging and chronic disease

Science Daily · 9 Apr 2026

Researchers at the Marshall University Joan C. Edwards School of Medicine have uncovered new evidence that tiny particles created in the gut may contribute to inflammation and chronic diseases linked to aging. The findings provide fresh insight into the connection between gut health, metabolism, immune function, and even sleep-related biological stress.

The study, published in Aging Cell , focused on gut luminal exosomes, microscopic particles that cells use to communicate by carrying proteins and genetic material throughout the body. Scientists discovered that exosomes taken from older animals contained molecular signals tied to insulin resistance, inflammation, and damage to the gut barrier. When those exosomes were transferred into young animals, the younger animals developed similar metabolic and inflammatory changes.

Researchers also observed the opposite effect. Exosomes collected from young animals and transferred into older animals reduced several aging-related metabolic problems. The results suggest that the gut environment itself may play an important role in the development of diseases associated with aging.

Gut Barrier Damage and Chronic Inflammation

The study indicates that gut exosomes could directly influence disease development. A weakened gut barrier can allow inflammatory substances to leak into the bloodstream, potentially triggering long-term inflammation and raising the risk of heart disease and metabolic disorders.

"This study helps clarify how the physiological stressors associated with biological aging may accelerate biological processes linked to aging and disease," said Abdelnaby Khalyfa, M.Sc., Ph.D., professor of biomedical sciences at the Joan C. Edwards School of Medicine and lead author on the study. "Understanding these mechanisms is essential to identifying new targets for intervention and improving long-term outcomes for patients."

The findings also reinforce the idea that aging affects multiple systems in the body at the same time, including metabolism, immune responses, and cellular communication pathways. Researchers identified specific molecules inside the exosomes that may eventually help scientists detect, better understand, and possibly treat age-related diseases.

The researchers noted that the findings may also apply to chronic conditions involving long-term physiological stress, particularly diseases that share biological pathways with aging.

The research team included Khalyfa, Trupti Joshi, Ph.D., and David Gozal, M.D., M.B.A., Ph.D. (Hon) from Marshall University, along with Lyu Zhen from the University of Missouri.

Funding for the study included unrestricted start-up support awarded to Khalyfa by the Joan C. Edwards School of Medicine through the Marshall University Research Corporation (MURC), Huntington, West Virginia, USA. Gozal also received partial support from NIH grants...

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Popular anti-aging drug combo caused severe brain damage in mice

Science Daily · 24 Nov 2026

A drug combination widely studied for its anti-aging potential may have a serious downside. Researchers at the University of Connecticut report that the treatment caused significant brain damage in mice, raising concerns about its growing use in longevity research and off-label anti-aging therapies.

The findings, published in PNAS , showed that the drug pairing dasatinib+quercetin (D+Q) damaged myelin, the protective coating that surrounds nerve fibers and helps electrical signals travel efficiently through the brain and body.

"When you administer this cocktail to an animal, young or old, the myelin is damaged, which makes it disappear. Even worse in the young animals" than in the aged ones, says UConn School of Medicine immunologist Stephen Crocker.

Myelin loss can lead to numbness, pain, difficulty walking, and problems with memory and thinking. Damage to myelin is also a defining feature of multiple sclerosis.

Anti-Aging Drugs and Brain Health Concerns

D+Q has become one of the most popular drug combinations in anti-aging research. Scientists have investigated it for its ability to remove aged cells that contribute to inflammation and age-related disease. The treatment is currently being explored for conditions including type II diabetes and Alzheimer's disease.

Outside clinical settings, some people interested in longevity have also experimented with the drugs on their own, despite warnings from medical professionals. However, very little research has examined how the combination affects the brain.

Researchers Evan Lombardo '23 (CLAS), now a neuroscience graduate student at Dartmouth, and Robert Pijewski '21 Ph.D., currently at Anna Maria College, wanted to see whether D+Q might help repair brain damage associated with multiple sclerosis.

To test the idea, the team treated both young mice (6 to 9 months old) and older mice (22 months old) with the drug combination. They also studied oligodendrocytes grown in laboratory dishes. These specialized brain cells are responsible for producing and maintaining myelin.

Severe Myelin Loss and "Chemo Brain" Effects

Healthy mice normally show thick myelin layers surrounding nerve fibers in the brain. In the treated mice, those protective layers were dramatically reduced after exposure to D+Q. Younger mice experienced even greater damage than older animals.

The researchers also found that the corpus callosum, a major structure that connects the two halves of the brain and supports many critical functions, had deteriorated in mice receiving the treatment.

Similar damage is sometimes seen in people undergoing chemotherapy and is associated with symptoms often described as "chemo brain."

Brain...

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Pigeons break the rules of navigation – and the secret lies is in their livers

refractor.io · 28 May 2026

Bird navigation has puzzled animal scientists for a long time, despite decades of research, not least because each species seems to have its own flight manual and designing experiments to unlock these secrets is incredibly challenging for us, on the ground.

Scientists, in the 1960s, first posited that birds locked into the Earth's magnetic field for navigation in flight, but as this 2021 review explains , experimental design left a lot to be desired, and replicating results also proved difficult. It's now fairly well accepted that migratory birds in particular use complex systems of internal magnetoreception and optical biochemistry to guide them in the air, but a lot of questions remain unanswered.

Now, in what may very well prove to be a landmark discovery, scientists at the Max Planck Institute of Animal Behavior in Germany believe they've cracked the code behind how homing pigeons can fly hundreds of miles and then return home with precision. Regardless of how you feel about these (rather unfairly) maligned birds, it would appear to possess a deceptively sophisticated way of staying on track in the air, that even involves their immune cells.

In a first, the scientists found that pigeons tap into the Earth's magnetic field through iron-rich immune cells only found in their livers.

These cells, or macrophages, primarily break down old red blood cells. During this process, they become enriched with iron, turning them into quantum powerhouses that connect with magnetic fields like an internal compass. Without these cells, the birds lose their way completely.

“We didn’t expect immune cells to act like sensors for magnetic fields at all," says Professor Christian Kurts, Director at the Institute of Molecular Medicine and Experimental Immunology at the University Hospital Bonn, and one of the study’s co-senior authors."Our results reveal a previously unknown mechanism for magnetic perception in animals."

“What looks like a ‘gut feeling’ in bird navigation may actually have a physical basis,” adds co-author Professor Martin Wikelski, Director at the Max Planck Institute of Animal Behavior.

As touched on earlier, while we know migratory birds and other long-distance flyers use the Earth's magnetic fields, but precise understanding of the tools they have on board in order to do this has eluded scientists. In this study, the researchers wanted to work out just how pigeons were also harnessing the power of the planet.

Earlier research, even studies from the trailblazing husband-and-wife duo Wolfgang and...

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NASA Finds a “Goldilocks” Giant Planet Wrapped in Methane

Sci Tech Daily · 28 May 2026

NASA 's James Webb Space Telescope has uncovered a rare alien world that sits in a cosmic "sweet spot" between scorching hot Jupiters and frozen gas giants like Saturn .

Astronomers using NASA's James Webb Space Telescope (JWST) have examined the atmosphere of a rare giant planet with temperatures surprisingly close to those found on Earth. The planet, called TOI-199b, is about the size of Saturn and contains methane in its atmosphere, according to a new study.

The discovery is unusual because giant planets are typically found in extreme environments. In our solar system, Jupiter and Saturn are icy cold because they orbit far from the Sun. Many giant planets discovered around other stars are "hot Jupiters," which orbit extremely close to their stars and can heat up to thousands of degrees.

TOI-199b is different. Scientists classify it as a temperate giant planet, a category that includes only a small number of known worlds. Researchers say this is the first time the atmosphere of one of these milder giant planets has been studied in detail.

The findings could help researchers improve computer models that explain how planets and atmospheres form and change over time. The work may also provide new clues about atmospheric processes on Earth.

The research, led by scientists from Penn State and NASA's Jet Propulsion Laboratory (JPL) at the California Institute of Technology, was published May 20 in the Astronomical Journal .

"One of the main advantages of studies of planets beyond our solar system, known as exoplanets, is the ability to study many different types of planets — especially ones that we don't see in the solar system — to learn about how planetary systems form and evolve," said Renyu Hu, associate professor of astronomy and astrophysics in the Penn State Eberly College of Science and leader of the research team. "Since the first exoplanet was discovered in 1992 by a team that included Aleksander Wolszczan at Penn State, astronomers have found thousands of exoplanets. But only a few giant, temperate exoplanets are known, and this is the first time that we have been able to study the atmosphere of one of them in detail."

TOI-199b circles a star located more than 330 light-years from Earth and completes an orbit about every 100 days.

Its estimated temperature is around 175 degrees Fahrenheit . While that is still extremely hot by human standards, it is...

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Scientists Discover Sperm Seem To Bypass a Fundamental Law of Physics

Sci Tech Daily · 28 May 2026

Sperm cells move through fluids that should stop them almost instantly, yet new research suggests they succeed by exploiting unusual properties of active living matter.

At microscopic scales, fluid does not behave like water in a pool. It acts more like a thick barrier, stopping motion almost instantly. Yet sperm cells still push forward with waving tails, even through fluids that should strongly resist them.

A study led by Kyoto University mathematical scientist Kenta Ishimoto suggests that sperm accomplish this by exploiting a strange feature of living matter. Their motion appears to sidestep the usual action-and-reaction symmetry described by Newton's third law.

Newton's third law is often summarized as, "for every action, there is an equal and opposite reaction." That principle works well for everyday objects, such as two marbles colliding and bouncing apart. But sperm are active systems. They constantly add energy to their own motion.

As the researchers write, "Newton's third law may be violated when we regard it as an open system, with its mechanical energy being injected from microscopic active units."

In other words, sperm are not breaking physics. They are revealing what happens when living systems pump energy into their surroundings from within.

For sperm, there is no gliding between strokes. At their scale, inertia is almost irrelevant and viscosity dominates. If the tail stops beating, the cell stops moving almost immediately.

That creates a problem known as the scallop theorem. A microscopic swimmer cannot move through a viscous fluid by simply repeating a motion and then reversing it. To make progress, it needs a stroke that is not perfectly reversible.

Sperm solve this with flagella, the thin flexible tails that send traveling waves along their length. Green algae such as Chlamydomonas use similar structures to swim.

These waves are powered by molecular motors inside the flagellum. Because those motors inject energy into the tail, it behaves less like a passive spring and more like an active material.

The study focuses on a property called odd elasticity. In ordinary elastic materials, force and response are reciprocal. Bend or stretch them, and they push back in a predictable way.

Odd elasticity allows a different kind of response. In active materials, internal energy sources can produce forces that do not simply mirror the forces acting on them. That non-reciprocal behavior can help sustain waves, even when thick fluid drains energy from motion.

To describe this process, the...

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Sea creature's amputated limbs refused to die, even after three years

refractor.io · 28 May 2026

It came from a creature of the depths. A severed foot that refused to die, regenerating in an act of survival unlike anything we've ever seen.

It could be a great opening to a horror novel (agents, call me), but to researchers from Memorial University and the Society for Exploration and Valuing of the Environment in Canada, this discovery of a "real-life zombie" is no work of fiction.

"Here is this species that has this groundbreaking ability, and we had no idea," says Memorial University marine biogeochemist Rachel Sipler, who is also a senior researcher at the Bigelow Laboratory for Ocean Sciences. "It's a reminder how much is yet to be discovered in the marine environment and how important it is to protect these resources that may hold really valuable knowledge for us."

Found in the cold-water regions of the Atlantic and Arctic oceans, the dendrochirotid sea cucumber Psolus fabricii already resembles a living nightmare. Branches of blood-red tentacles blossom from one end of a fleshy, scale-covered body, beneath which numerous tube feet carry it around the ocean floor, no doubt just to terrify baby fish into staying in bed at night.

Being relatively soft creatures in a world of sharp rocks and sharp teeth, these delicate footsies are prone to damage, forcing the sea cucumbers – like most echinoderms – to evolve remarkable means of healing and regeneration.

To understand what happens to the lost feet themselves, researchers collected a bunch of samples and kept a close watch over them in the ensuing days, analyzing their tissues and anatomical structures, and even using specially labeled amino acids and ammonia in the seawater to monitor the nutrients they absorbed.

Over the following week, the lopped-off locomotive tubes changed. Far from rotting away, a churning over of new and old cells helped the amputated limb heal, while immune cells exploded in numbers.

What was once a foot slowly transformed into a spherical blob of living muscle and connective tissue. Within a month, the site of the wound was indistinguishable from the rest of the sample. Pigmented cells migrated deeper inside, leaving a translucent “skin.” Two months later, the shrunken balls had returned to their original size. After three months, they had grown bigger than before.

A year rolled by. Then two. And still they lived, continuing their blind, lonely existence under a thick layer of sediment in the tanks. While none...

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Scientists discover hidden gut-brain circuit that triggers protein cravings

Science Daily · 12 Apr 2026

Eating is about far more than simply getting enough calories. The body must also obtain the right balance of nutrients, especially essential amino acids, which are the building blocks of protein that the body cannot produce on its own.

Now, researchers have uncovered a hidden communication system between the gut and brain that helps animals detect when protein is missing and pushes them to seek out the nutrients they need.

A team led by Director SUH Seong-Bae of the Center for Microbiome-Body-Brain Physiology at the Institute for Basic Science (IBS), working with scientists from Seoul National University and Ewha Womans University, identified a previously unknown gut-brain signaling network that rapidly changes feeding behavior when protein levels drop.

The findings were published in the journal Science on May 21.

Proteins are essential because they contain amino acids that animals cannot make themselves. Scientists have long known that animals tend to crave protein-rich foods when deprived of protein, but exactly how the body senses this deficiency remained unclear.

The researchers discovered that the gut responds to protein shortages using two separate but coordinated communication pathways.

One pathway works quickly through the nervous system, rapidly alerting the brain that essential amino acids are lacking. The second pathway acts more slowly through hormones circulating in the body, helping sustain protein-seeking behavior over a longer period.

To uncover the mechanism, the team studied fruit flies, which are commonly used to investigate the neural circuits involved in feeding behavior. Using brain imaging, behavioral testing, and genetic experiments, the scientists mapped the specific circuitry involved.

When flies lacked protein in their diet, specialized cells in the intestine released a peptide hormone called CNMa. This hormone activated enteric neurons connected to the gut, which then quickly transmitted signals to the brain through a direct gut-brain neural pathway.

At the same time, CNMa also traveled through the bloodstream as a hormone, reaching the brain more gradually and reinforcing the drive to seek essential amino acids.

"Our study shows that the gut is not simply a digestive organ, but an active sensory system that continuously monitors nutritional state and directly guides behavioral decisions," said Director SUH Seong-Bae.

Gut Signals Shift Cravings Away From Sugar

The newly identified system did not simply make animals eat more overall. Instead, it specifically changed what they wanted to eat.

The researchers found that protein deficiency increased attraction to protein-related nutrients while simultaneously reducing interest...

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Heron-like, fish-eating dinosaur from 70 million years ago discovered in Argentina

Phys Org · 28 May 2026

A new raptor-like dinosaur from some 70 million years ago that ate fish and behaved like modern herons has been unearthed from southern Patagonia. The new species, which has been named Kank australis, was identified based on the discovery of fossil remains including teeth, vertebrae, and toe bones.

K. australis is an unenlagiid , a family of small-to-medium sized theropod dinosaurs whose members have been unearthed from Late Cretaceous deposits in South America, Antarctica, Australia, and Madagascar. Based on comparison with another unenlagiid, Neuquenraptor argentinus, which lived in northern Patagonia 90 million years ago, researchers believe adults of the new species likely grew up to some 2.5–3 meters long.

The new species is described by paleontologist Dr. Matías Motta, of the Bernardino Rivadavia Natural Sciences Museum in Buenos Aires (Museo Argentino de Ciencias Naturales "Bernardino Rivadavia"), and his colleagues in a paper published today in the Journal of Vertebrate Paleontology .

"Kank lived in a landscape of meandering rivers and streams with seasonal ponds, inhabited by aquatic plants such as water lilies and animals including fish, insects, and various mollusks," says Dr. Motta.

Based on the analysis of ancient soil samples and fossilized plant remains, he explains, we know that "70 million years ago the climate was temperate and humid, with seasonal rainfall, very different from the current cold and relatively dry conditions."

Analysis of the fossilized remains of the new dinosaur, meanwhile, has shined light on how it might have lived. "The cervical vertebrae of Kank show special structures for muscle attachment and the protection of neck blood vessels—features particularly important in modern birds with complex neck movements, such as herons," says Dr. Motta.

"This suggests Kank may have been an active fisher, contrasting with common portrayal of raptors as agile terrestrial predators, like Velociraptor from the Northern Hemisphere."

The discovery also helps fill in some more of the patchy evolutionary history of the unenlagiids in South America. While seven different species have been recorded in northern Patagonia, until now the fossil record had only yielded a few isolated remains from the south of the region that paleontologists were unable to attribute to particular species.

"Kank helps bridge a distributional gap for the Late Cretaceous of southern Patagonia, connecting known records from northern Patagonia and Antarctica, and showing that this family was dispersed across different latitudes of South America."

K. australis was unearthed at La Anita farm, near the...

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REACH UPDATE

Help us improve IUCLID

ECHA · 20 May 2026

We have launched a survey to gather your feedback on how you use IUCLID and how the user experience could be improved. We want to understand better your needs, for example, related to usability, learning curves and day-to-day workflows.

Our aim is to identify practical improvements and make IUCLID more user-friendly and efficient for everyone working with chemical data and preparing dossiers.

The survey is now open – have your say until 31 July 2026.

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REGULATORY UPDATE

ASIA PACIFIC

Over 61 % Nepalis drink water polluted with E. coli

The Rising Nepal · 20 May 2026

The latest National Multiple Indicator Cluster Survey (NMICS) 2024-25 showed that only 40 per cent of people have access to safely managed sanitation and 47 per cent to safe drinking water, while 61 per cent drink water contaminated with E. coli across the country.

Giving information at the Media Roundtable Series on MICS Data for Children: Water, Sanitation and Hygiene (WASH), Siddhi Shrestha, a WASH specialist, said that the survey conducted by the National Statistics Office (NSO) with the technical and financial support from UNICEF, found widening provincial and socioeconomic disparities, highlighting that progress must accelerate sharply if Nepal is to meet its 2030 SDG targets.

A total of 12,960 sample households were selected for the survey. According to the survey, 40 out of every 100 people have access to safely managed on-site sanitation. This metric signifies that human waste is being safely contained and treated at the community and household levels.

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AMERICA

Mountain View lifts boil water notice near Cuesta Park

Mountain View Voice · 20 May 2026

It took nearly a month but all the homes near Mountain View's Cuesta Park are now in the clear and have safe drinking water once again.

On Tuesday afternoon, Mountain View lifted a "boil water" notice for the last 21 households that had been without access to clean piped water since a city contractor inadvertently contaminated a water main on April 24. In total, 67 households in the Cuesta Park neighborhood were initially affected by the breach, leading the city to declare a state of emergency last month.

While safe drinking water was restored to the majority of the homes two weeks ago, the boil water notice stayed in place for 21 remaining homes on Drucilla Drive and Carla Court. Samples collected from pipes connecting to the homes continued to test positive for coliform bacteria, which is typically harmless but can indicate the presence of other harmful organisms in the water supply, according to a fact sheet from the California State Water Resources Control Board.

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Money for clean drinking water threatened by Newsom administration's climate overhaul

CAL Matters · 14 May 2026

Seven years ago, California Gov. Gavin Newsom signed a law to bring safe and affordable drinking water to the state's most disadvantaged communities.

Last week, Newsom celebrated the program's accomplishments.

"Over 1 million people that didn't have access to clean, safe drinking water today have access to clean, safe drinking water," Newsom told a conference room filled with California's water leaders, to a round of applause.

"I'm not saying that to impress you, but to impress upon you real progress. A lot more work to be done."

But that work could lose critical funding as the Newsom administration overhauls its source: California's carbon market. The changes to the program's funding priorities and revenue threaten efforts to bring clean drinking water to schools, homes and communities across California.

"If that funding goes away," said Sherry Hunter, who has long battled the arsenic leaching into the water supply in the historic Tulare County town of Allensworth, "Oh my god, I can't even imagine."

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California Releases Draft Cancer Risk Assessments for Two Air Toxics

State of California OEHHA · 14 May 2026

Today the Office of Environmental Health Hazard Assessment (OEHHA) released draft risk values for two air pollutants — acrolein and ethylene oxide. This new research found both chemicals can potentially pose elevated cancer risks to many Californians, with some communities facing greater exposure.

The assessments are based on new research and a greater understanding of the related health risks. They come as the U.S. Environmental Protection Agency (US EPA) is proposing to roll back its own rules for ethylene oxide emissions and re-evaluating the underlying science, making it more critical than ever for California to conduct its own assessments.

"We must stay focused on improving air quality," said California EPA Secretary Yana Garcia. "As the US EPA slashes air quality-related research and protections, California is doubling down on independent, best-in-class science that paves the way to healthier air for all Californians."

Heath risks from acrolein and ethylene oxide

Acrolein and ethylene oxide both pose an estimated cancer risk exceeding 800 in 1 million based on the draft cancer risk values and early research. This is more than 10 times higher than the cancer risk from benzene and puts it on par with the cancer risk diesel exhaust posed when it was first identified as a major concern in the late nineties.

This estimated cancer risk characterizes current risk and does not represent a significant recent shift in regional air quality. Estimates of cancer risk reflect the best available science and indicate a cause for concern. However, fully understanding the extent of this risk and the sources will require additional study and remain an active area of research.

OEHHA's assessment for acrolein provides the first cancer risk value for this chemical since it was classified as "probably cancer-causing to humans" in 2020. In addition to cancer risk, acrolein can irritate your eyes, nose and throat in the short term, causing symptoms like watery eyes, coughing, or a burning feeling. Long-term exposure to higher levels can harm the respiratory system, leading to problems such as congestion, shortness of breath, worsened asthma, and ongoing irritation.

Ethylene oxide can also irritate your nose and throat and cause headaches, dizziness, nausea, fatigue, and stomach distress.These effects may disappear after exposure stops but irritation can become persistent after long-term exposure. Ethylene oxide also is considered a reproductive toxicant.

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EUROPE

UK to prioritise alignment with EU on chemicals regulation

The Chemical Engineer · 21 May 2026

THE UK will align its chemicals regulation with EU rules unless "very exceptional circumstances" require otherwise, government officials have said.

Following Brexit, the UK introduced its own regime for the registration, evaluation, authorisation and restriction of chemicals (REACH), replacing the EU framework that had previously applied. However, industry has expressed frustration at what it sees as a lack of clarity over how and when different aspects of UK REACH will take force.

Speaking at the ChemUK trade show in Birmingham on Wednesday, government officials stressed that UK regulation will remain closely aligned with EU rules in force before Brexit.

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High levels of toxic 'forever chemicals' found off coast of southern England

The Guardian · 19 May 2026

Study of Channel finds levels of toxic Pfas in Solent at 13 times safe limits in some places, with much coming from treated sewage

Scientists have found high levels of toxic Pfas, or "forever chemicals", in soil, water and throughout the marine food chain in the UK's Solent strait, including at protected environmental sites, according to a new study.

In some samples, pollution was 13 times the safe threshold for coastal waters. Others, which were below legal limits for individual chemicals, failed tests for combined toxicity.

The samples were taken from the Solent strait, which runs between the Isle of Wight and the mainland, forming part of the Channel. The chemicals are thought to have entered the environment from wastewater treatment plants, sewage outflows, historic landfills and nearby military sites.

Researchers said their findings highlighted the need to monitor chemicals in combination and to make a blanket ban on Pfas part of the government's water reform agenda.

Prof Alex Ford, a biologist at the University of Portsmouth and one of the study's authors, said: "If there was an oil spill in the Solent that industry would have to pay for the restoration of those habitats, but that doesn't happen with sewage.

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Commission presents updated EU Emissions Trading System benchmarks for consultation

European Commission · 11 May 2026

The European Commission has today proposed the updated European Union Emissions Trading System (EU ETS) benchmark values for 2026-2030, which will now be open to public and Member State consultation before adoption.

The benchmark update is a key step in determining the level of free allocation of allowances for European industry. With the proposed benchmarks, industry will, on average, continue to receive free allocation covering around 75% of its emissions. The Commission is addressing industry concerns by making full use of the legal flexibilities available. To incentivise industrial electrification, the updated approach maintains coverage of indirect emissions from electricity use across 14 product benchmarks. This leads to higher benchmark values with a financial impact of around €4 billion for the 2026-2030 period.

The update to the benchmark values for the period 2026-2030 is required under the ETS Directive. It complements the proposed amendment to the ETS Market Stability Reserve presented on 1 April, which will adapt and better equip the reserve to respond to future market developments, including potential tightness in supply in the coming decades. Together, these measures will help support the competitiveness and decarbonisation of EU industry while further reinforcing the stability and predictability of the EU's carbon market.

These measures should also be seen in the broader context of the EU ETS review due in July 2026, which aims to ensure that the ETS remains fit for the future and continues to support European industry in its decarbonisation transition.

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Omnibus: EFSA proposes safer and faster alternative to unlimited pesticide approvals

PAN Europe · 13 May 2026

New information from the European Food Safety Authority (EFSA) proposes a safer, faster, and more effective alternative to the European Commission's Omnibus "simplification" proposal, which would grant unlimited approval to pesticides and inevitably lower the level of protection. With a bit more

resources, EFSA could address current delays in risk assessments within three years, improve the quality of evaluations, and prevent future backlogs in the EU pesticide approval system.

The Omnibus proposal grants most active substances unlimited approval. Scientists, law experts and NGOs warn against it, as it will significantly lower the current level of protection for human health and the environment.

This deregulation measure is presented by the Commission as a way to simplify and reduce administrative backlogs in the EU approval system yet it is clear it will fall short of achieving this goal. In written answers sent on 8 May to French MP Benoît Biteau and the Croatian MEP Biljana Borzan, EFSA indicated practical alternatives to unlimited approval that would be both safer and more effective than the Commission's plan. These solutions are not included in the Commission's proposal.

According to EFSA, recruiting around 50 additional experts and rejecting incomplete industry dossiers would drastically reduce delays in pesticide reassessments, while maintaining high standards of protection for health and the environment. It would have a "transformative effect" on the EU pesticide assessment system. Most notably, EFSA estimates that the current backlog of renewal assessments could be cleared in approximately three years under such an approach, compared to eight years under the Commission's proposal for unlimited approvals.

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INTERNATIONAL

Collaboration with Taiwan Ministry of Environment

US EPA · 14 May 2026

Taiwan is an environmental leader in the Indo-Pacific region. EPA established an agreement with Taiwan Ministry of Environment (MOENV) in 1993, under the auspices of the American Institute in Taiwan (AIT) and Taiwan Economic and Cultural Representative Office (TECRO), to advance joint environmental programs.

EPA's close partnership with MOENV has now evolved into a robust platform for sharing experience and expertise with each other as well as assisting environmental agencies and partners in the Indo-Pacific, Latin America, and Africa regions. Through this partnership, U.S. and Taiwan environmental authorities have worked to manage the environment and reduce pollution through projects, research, and knowledge exchange.

In 2014, EPA and MOENV officially launched the International Environmental Partnership (IEP), a network of experts from around the world working together to strengthen capacity for addressing environmental challenges. In 2020, the IEP expanded to collaborate with Ministry of Health and Welfare (MOHW), Ministry of Education (MOE), Ministry of Economic Affairs (MOEA), and Ocean Affairs Council (OAC). To date, the IEP has:

- Expanded mercury monitoring in the Asia Pacific region to harmonize atmospheric mercury monitoring
- Established a regional air quality protection program to strengthen air quality management
- Supported countries in developing new approaches to managing electronic waste

- Advanced the Global Environmental Education Partnership in environmental literacy.

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Recycled food-contact materials need regulatory harmonization, UN report says

Packaging Dive · 14 May 2026

The United Nations' food organization addressed a contentious packaging issue in a new report Wednesday: While recycled plastic in food packaging offers certain environmental benefits, it also brings chemical safety concerns, the Food and Agriculture Organization wrote.

An absence of globally harmonized standards is complicating the situation. The report calls for updating existing regulatory frameworks to ensure safe production and application of recycled food-contact materials. FAO also said more research is needed on contaminants, exposure scenarios and traceability.

"We want to recycle more plastic, but we also want to make sure that by solving one problem we don't create new problems," said Corinna Hawkes, director of the Agrifood Systems and Food Safety Division at FAO, in a statement. "Food safety must be a central consideration in the transition towards more sustainable agrifood systems and food consumption patterns."

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HAZARD ALERT

Acetophenone

29 May 2026

Acetophenone is the organic compound with the formula C6H5C(O)CH3. It is the simplest aromatic ketone. [1] Is a colourless or yellow-tinted liquid with a sweet, strong odour. [2]

Uses [3]

Acetophenone is used in perfumery as a fragrance ingredient in soaps, detergents, creams, lotions, and perfumes; as a flavouring agent in foods, non-alcoholic beverages, and tobacco; as a specialty solvent for plastics and resins; as a catalyst for the polymerisation of olefins; and in organic syntheses as a photosensitiser.

Sources & Routes of Exposure

Sources of Exposure [3]

- Occupational exposure to acetophenone may occur during its manufacture and use.
- Acetophenone has been detected in ambient air and drinking water; exposure of the general public may occur through the inhalation of contaminated air or the consumption of contaminated water.

Routes of Exposure [4]

Acetophenone can be absorbed into the body by inhalation, through the skin and by ingestion. A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster and may pose a risk via inhalation.

Health Effects

Acute Effects

- Acute exposure of humans to acetophenone vapour may produce skin irritation and transient corneal injury. One study noted a decrease in light sensitivity in exposed humans.
- Acute oral exposure has been observed to cause hypnotic or sedative effects, haematological effects, and a weakened pulse in humans.
- Congestion of the lungs, kidneys, and liver were reported in rats acutely exposed to high levels of acetophenone via inhalation.
- Tests involving acute exposure of rats, mice, and rabbits have demonstrated acetophenone to have moderate acute toxicity from oral or dermal exposure.

Chronic Effects

- No information is available on the chronic effects of acetophenone in humans.
- Degeneration of olfactory bulb cells was reported in rats chronically exposed via inhalation. In another study, chronic inhalation exposure of rats produced haematological effects and, at high doses, congestion of cardiac vessels and pronounced dystrophy of the liver.
- In two studies, no effects were observed in rats chronically exposed to acetophenone in their diet.
- EPA has not established a Reference Concentration (RfC) for acetophenone.
- The Reference Dose (RfD) for acetophenone is 0.1 milligram per kilogram body weight per day (mg/kg/d) based on general toxicity in rats.

Reproductive/Developmental Effects

- No information is available on the reproductive or developmental effects of acetophenone in humans.
- In one study of pregnant rats exposed dermally, no effects on reproduction or development were noted.

Cancer Risk

- No information is available on the carcinogenic effects of acetophenone in humans or animals.
- EPA has classified acetophenone as a Group D, not classifiable as to human carcinogenicity.

Safety [5]

First Aid Measures

- Eye Contact: Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention immediately.
- Skin Contact: In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
- Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
- Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
- Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Fire & Explosion Information

- Acetophenone is Combustible.
- Auto-Ignition Temperature: 570°C (1058°F)
- Flash Points: Closed Cup: 77°C (170.6°F)

Open Cup: 82.2°C (180°F)

- Acetophenone is flammable in presence of open flames and sparks, of heat, of oxidising materials.
- Dry chemical powder should be used to extinguish small fires
- Water spray, fog or foam should be used to extinguish large fires.
- Do not use water jet.
- Acetophenone should be stored away from direct sunlight. When heated to decomposition it emits acrid smoke and fumes.

Exposure Controls & Personal Protection

Engineering Controls

- Exhaust ventilation or other engineering controls should be provided to keep the airborne concentrations of acetophenone vapours below their respective threshold limit value.
- Ensure that eyewash stations and safety showers are proximal to the workstation location.

Personal Protective Equipment

The following personal protective equipment should be used when handling acetophenone:

- Splash goggles;
- Lab coat;
- Gloves

Personal Protection in Case of a Large Spill:

- Splash goggles;
- Full suit;
- Boots;
- Gloves;
- Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product

Regulation

United States [6]

ACGIH: The American Conference of Governmental Industrial Hygienists has set a Threshold Limit Value (TLV) for acetophenone of 10 ppm, 49 mg/m3 Time Weighted Average

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JANET'S CORNER

Who Am I?

29 May 2026

I am the king of chemicals, and industrial nations measure their prosperity by how much of me they produce each year.

My oily appearance and violent thirst for water make me one of the most treacherous substances in the lab—I can ignite organic matter on contact through sheer exothermic passion.

I am essential to refining petroleum, fertilizing crops, and extracting metals; without me, the modern world simply cannot function.

I am a colorless liquid formed when sulfur trioxide dissolves in water, and my chemical formula is H_2SO_4.