New International Paleontology Award Named After Chinese Scholar

At the 18th International Symposium on Early and Lower Vertebrates held in Berrechid, Morocco from February 7 to 10, upon the proposal and vote of the Organizing Committee of the International Society of Early and Lower Vertebrates, a new award—the Meemann Chang Award—was established in honor of Prof. ZHANG Miman, a Chinese paleontologist from the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP), Chinese Academy of Sciences (CAS). The award aims to recognize outstanding young researchers in the field.

The Meemann Chang Award is one of the only two awards currently in the field of early vertebrate research. The other one is the Stensiö Award, which honors the research achievements and influence of middle-aged and young scholars in this field. Dr. LU Jing, an IVPP researcher, was presented with the Stensiö Award at this symposium.

Prof. ZHANG, a CAS Member, is a founder of paleoichthyology and research on the origin of tetrapods in China. Her achievements have shifted the focal region for research on the origin and early evolution of sarcopterygians from Europe and America to China. ZHANG was once elected as the President of the International Society of Paleontology and is currently a foreign academician of the national academies of sciences of multiple countries.

ZHANG has been honored with a lot of prizes/awards. In 2016, she was awarded the Romer-Simpson Lifetime Achievement Award, the highest honor of the Society of Vertebrate Paleontology. In 2018, she became the first Chinese scholar to win the L'Oréal-UNESCO for Women in Science Award; and in the same year received the Ho Leung Ho Lee Foundation Prize for Scientific and Technological Achievements. In 2021, the International Astronomical Union's Minor Planet Center officially named an asteroid "Meemann Chang" in her honor.

Chinese paleontologist, CAS Member ZHANG Miman (Meemann Chang). (Credit: IVPP)

Ammonia Synthesis at Room Temperature

Making ammonia—the backbone of fertilizers and a key industrial chemical—has always demanded enormous energy. The industrial Haber-Bosch process employs high temperatures and pressures to drive the reaction of nitrogen and hydrogen to produce ammonia, consuming vast amounts of energy and releasing substantial carbon emissions. As reported in *Chem* (doi: 10.1016/j.chempr.2025.102884) on February 10, a team led by Prof. DENG Dehui and Prof. YU Liang from the Dalian Institute of Chemical Physics (DICP), along with Prof. CUI Yi from the Suzhou Institute of Nano-Tech and Nano-Bionics—both affiliated with the Chinese Academy of Sciences—have developed a catalyst that accomplishes the same reaction at room temperature and ambient pressure.

The key to this thermocatalytic ammonia synthesis under ambient

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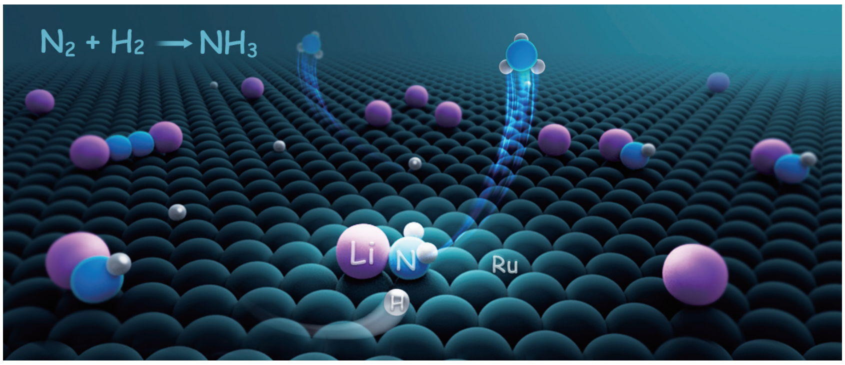
conditions is an interface between metallic lithium (Li) and ruthenium (Ru). The Li/Ru interface presents a synergetic effect, which promotes both N_2 activation and hydrogenation steps, both critical for the production of NH_3 under ambient conditions. To *in-situ* build this interface, the team designed and assembled a lithium battery—lithium metal at the anode, ruthenium nanoparticles on carbon nanotubes at the cathode. During discharge, the active lithium-ruthenium interface forms spontaneously. Flowing nitrogen and hydrogen across the interface at around 25°C and normal atmospheric pressure, the system produced ammonia steadily for over 400 hours across more than 120 charge-discharge cycles.



Nitrogen (N_2) and hydrogen (H_2) flowing across the lithium-ruthenium (Li/Ru) interface are converted into ammonia (NH_3) at around 25°C and normal atmospheric pressure. (Graphic: DICP)

"Integrated with high-efficiency energy-storage Li battery systems, this process provides a new way to establish a low-energy and sustainable paradigm for NH_3 synthesis," said Prof. DENG, one of the leading authors.

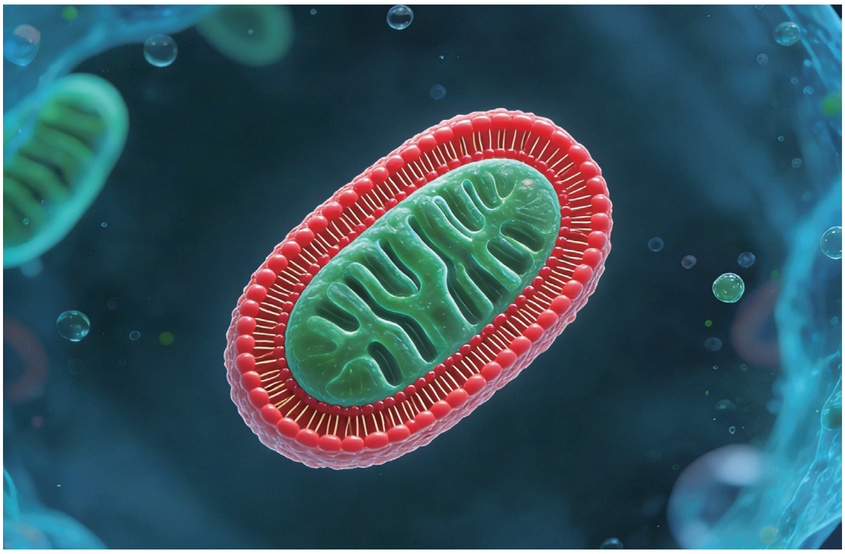
Mitochondria in a Capsule

Mitochondrial diseases—caused by defects in the cell's energy-generating machinery—have long resisted effective treatment. Researchers from LIU Xinguo's group at the Guangzhou Institutes of Biomedicine and Health (GIBH), Chinese Academy of Sciences, have now developed a method to deliver healthy mitochondria directly into diseased cells.

As published in *Cell* (March 2026, doi: 10.1016/j.cell.2026.02.023), the team encapsulated donor mitochondria inside vesicles made from red blood cell membranes, producing microscopic "mitochondrial capsules" roughly one micrometer across. These capsules protect their cargo during delivery and achieve around 80% transplantation efficiency in cultured cells. Once inside, the donor mitochondria fuse with the recipient cell's own mitochondrial network and sustain long-term function.

Testing in cells carrying mtDNA deletions or point mutations, the team showed that the transplanted mitochondria compensated for the genetic defects, restoring normal energy production. They then validated this in animal models: in mice with Leigh syndrome, a severe

Encapsulated mitochondria as a therapeutic vehicle. A donor mitochondrion (green) is wrapped in a red blood cell membrane-derived vesicle (red), shielding it for delivery into cells with mitochondrial dysfunction—an approach shown to rescue disease models of Leigh syndrome, mtDNA depletion syndrome, and Parkinson's disease. (Graphic: LIU Xinguo's group)



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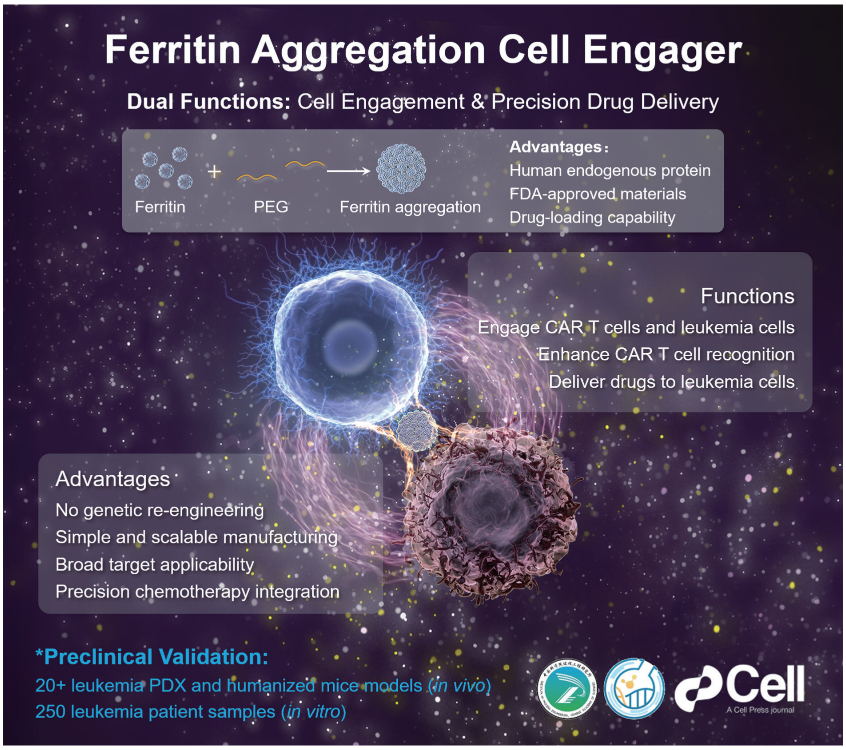
mitochondrial disorder, capsule treatment improved motor performance and extended survival; in a mouse model of mitochondrial DNA depletion syndrome, it restored mtDNA levels and reversed liver damage; and in a pharmacological model of Parkinson's disease, it rescued neurons, improved motor skills, and recovered mitochondrial function in affected brain regions. The authors proposed this as a broader "organelle therapy" strategy—one that could eventually extend to other degenerative diseases rooted in cellular energy failure.

A Molecular Bridge for Leukemia

CAR T cell therapy uses a lab-engineered protein grafted onto a patient's own T cells that directs them to seek and destroy cancer cells bearing a specific target on their surface. It has transformed leukemia treatment, but more than half of patients eventually relapse—often because leukemia cells shed the surface antigens that CAR T cells are engineered to recognize.

Researchers at the Institute of Process Engineering (IPE), Chinese Academy of Sciences, working with Zhujiang Hospital and the Institute of Hematology & Blood Diseases Hospital, have now developed a biomimetic platform that keeps CAR T cells effective even when antigen levels collapse, without any additional genetic modification of the cells.



A biomimetic platform using ferritin aggregation as a bridge to enhance CAR T cell therapy against leukemia. (Image by LI Feng)

Published in *Cell* (doi: 10.1016/j.cell.2026.02.005) on March 9, 2026, the approach centers on a protein called ferritin—the natural binding partner of CD71, an iron-transport receptor found abundantly on both CAR T cells and leukemia cells across disease types and stages. By precisely controlling assembly conditions, the team induced ferritin to self-assemble into a molecular bridge they call FACE (ferritin aggregation cell engager). Added to CAR T cells during routine preparation, FACE latches onto CD71 on the T cell surface; after infusion, it simultaneously grabs CD71 on leukemia cells, physically locking the two together and sharpening the immune attack. In patient-derived mouse models with normal antigen levels, FACE-CAR T cells matched the efficacy of conventional CAR T cells at just one-fifth the dose, reducing the risk of cytokine release syndrome. When antigen expression fell below 10% of normal—a level at which standard CAR T cells largely fail—FACE-CAR T cells still cleared the cancer and achieved 100% survival of model mice. Loading ferritin's hollow cage structure with chemotherapy drugs produced a further-enhanced version, FACED, which eliminated even antigen-negative leukemia cells—the subpopulation most responsible for relapse. Because FACE is made from an endogenous protein and FDA-approved polymer derivatives, it can be incorporated into existing CAR T manufacturing as a simple culture supplement, with no new engineering required.

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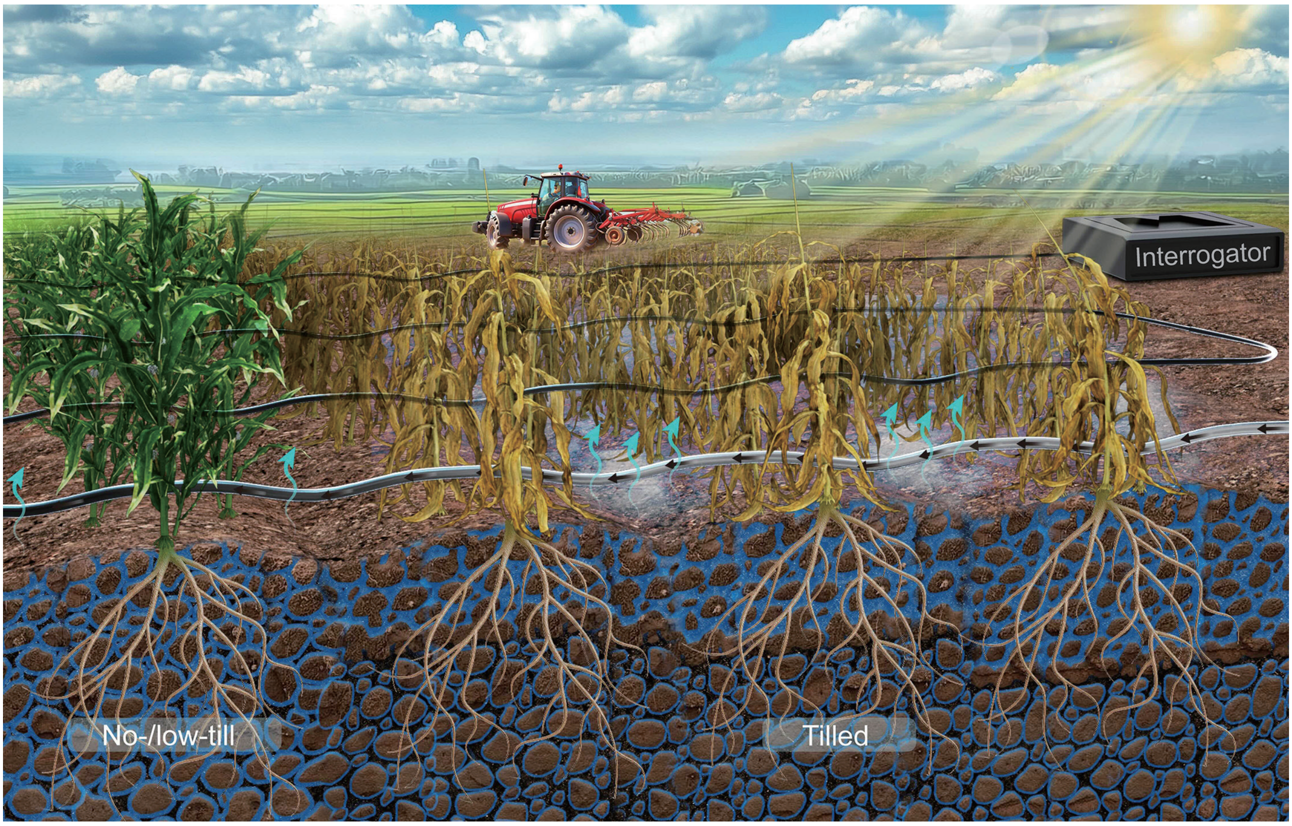
The Hidden Plumbing of Healthy Soil

Soil is far more than dirt—it is a living, porous system threaded with microscopic channels that draw rainwater deep underground, where plant roots can reach it. Researchers at the Institute of Geology and Geophysics of the Chinese Academy of Sciences (IGGCAS), along with their international collaborators, have now shown, in striking detail, how common farming practices quietly destroy this natural plumbing. The findings were published in *Science* (doi: 10.1126/science.aec0970) on March 19.

To observe what happens beneath the surface without disturbing the land, the team repurposed standard fiber-optic cables—the same kind used in broadband internet networks—into a large sensor array buried across an experimental farm at Harper Adams University in the United Kingdom. By detecting the faint vibrations produced by water moving through soil, the array tracked subsurface water flow minute by minute. In heavily cultivated fields, rainfall pooled near the surface rather than infiltrating downward. Shallow water evaporates quickly, leaving deeper soil layers dry and inaccessible to crops. In undisturbed soil, water moved efficiently into deeper layers, where it remained available during dry spells.

To explain these differences, the team developed a model built around the "ink-bottle effect"—water enters a soil pore easily but escapes with difficulty, held back by capillary forces that shift depending on whether the soil is wetting or drying. Repeated plowing and heavy machinery don't merely compact soil particles; they sever the mechanical bonds that keep these capillary networks intact. Without them, soil loses its ability to buffer crops against both flooding and drought—a vulnerability that will only deepen as extreme weather becomes more frequent.

Impact of farming practices on soil porous structure and hydrological process revealed by distributed acoustic sensing. (Image by IGGCAS)



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