

Ethical Guidelines to Regulate Human Genetic Data Research

Policy Express

By XU Zhilong, LIU Yin & LI Linxu

China's Ministry of Science and Technology has issued ethical guidelines for human genetic data research to promote responsible innovation and the healthy, orderly development of human genetic data.

The document seeks to regulate relevant scientific research and technological development activities, while protecting the legitimate rights and interests of research participants and related groups.

"The issuance of this document marks a crucial step forward for China's ethical governance in the field of human genetic data research, moving from a stage of 'principled advocacy' toward 'refined guidance,'" said Cong Bin, an academician of the Chinese Academy of Engineering.

Human genetic data refers to various kinds of data obtained or derived from human biological samples that directly reflect human hereditary information. This includes, but is not limited to, deoxyribonucleic acid (DNA) sequence data of the nuclear genome and mitochondrial genome, transcriptomic data, genotyping data and epigenetic modification data.

The rapid development of gene se-



Staff members conduct a hearing test for a young patient undergoing gene therapy in Jinan city, Shandong province. (PHOTO: XINHUA)

quencing, omics technologies and data analysis methods has supercharged genetic research. The advancement has deepened our understanding of disease etiologies, developmental mechanisms, classification systems and therapeutic pathways, providing crucial scientific support for biomedical research, disease prevention and precision medicine.

However, human genetic data possesses unique attributes, including high identifiability, lineage and population correlation and transgenerational continuity. Consequently, related sci-tech activities may trigger multi-layered and complex ethical, legal and social issues.

The guidelines lay down comprehensive regulations governing the basic principles, general requirements, special requirements and public science popularization of human genetic data research.

Sci-tech activities involving human genetic data should uphold the basic principles of promoting human well-being, respecting autonomy, controlling risks, doing no harm and preventing abuse, and ensuring fairness and justice.

They should aim to drive progress in life sciences, medicine and related technology fields, so as to improve human health, advance disease prevention

and treatment, and boost public interests and human well-being.

"Prioritizing human well-being means that all research activities must put people first," Cong said. Upholding a cautious approach, the guidelines emphasize risk control and the prevention of abuse. This fully demonstrates China's firm stance on the ethical governance of science and technology.

According to the guidelines, the principles of scientific rationality, legitimate purpose and minimal necessity should be adhered to, and the legitimate rights and interests of individuals respected and protected.

Relevant activities should strictly comply with national laws and regulations. Those engaged in such activities should possess the required qualifications and professional expertise.

Such activities should respect and protect the participants' right to know and choose freely, and follow legal procedures for informed consent.

According to the guidelines, sci-tech activities involving human genetic data should ensure that all data sources are legal, compliant, authentic, accurate and fully traceable.

Such activities should strengthen the protection of genetic privacy. Mining or using data with the intent to violate personal privacy is prohibited.



ulation and digital twin technologies to assess resource and energy consumption, as well as environmental impacts in key processes including manufacturing, usage and disassembly, while building product lifecycle databases and green design knowledge bases.

Going forward, the MIIT will work with relevant departments to develop green design solutions, advance the integration of "AI+Green Design," formulate related standards, promote representative green design products, expand training for green design professionals, and deepen international exchanges and cooperation.

These initiatives will help increase the supply of green products, stimulate green consumption, and strengthen the momentum for green development.

Under the guidelines, enterprises are encouraged to use 3D modeling, sim-

Industrial Design Goes Green

By TANG Zhexiao

Industrial products are in for a green design makeover, along with the green and low-carbon development of the manufacturing sector, after China recently released a set of guidelines to expedite the process.

The guidelines were jointly issued by the Ministry of Industry and Information Technology (MIIT), the National Development and Reform Commission, the Ministry of Education, the Ministry of Ecology and Environment and the State Administration for Market Regulation.

Green design, also known as ecodesign, is a design philosophy and methodology oriented toward sustainable development. It seeks to reduce or control resource consumption, and environmental impacts, across the entire product lifecycle starting from the initial design phase, according to the document.

Research shows that 80 percent of a product's lifecycle resource consumption and environmental impact are determined at the design stage.

In response to the evolving needs of green and low-carbon development both domestically and internationally, the guidelines promote industrial consensus on green design and outline 11

key priorities: long-life design, non-hazardous design, lightweight design, energy-saving design, water-saving design, material-saving design, noise-reduction design, space-saving design, easy recycling and regeneration design, reusable design, and zero-carbon design.

In addition, the document integrates these 11 priorities with real-world industrial applications. This is done through proposing 126 targeted solutions to guide product R&D personnel in applying green design concepts and methods to 15 key industries.

Pakistan's Higher Education Commission in 2023.

The CPJRC focuses on such areas as natural disasters, ecological environment, resource development and sustainable development.

Its researchers proposed a digital platform to share disaster-related open data in a fully digital format, so as to enhance data accessibility and lower economic and technical barriers, providing a replicable model of data aggregation,

open sharing, rapid response, and research promotion for underdeveloped regions.

New opportunities for broader cooperation

The achievements in both space exploration and disaster management have created new opportunities for broader cooperation in emerging fields.

During Pakistani Prime Minister Shehbaz Sharif's visit to China from May 23 to 26, the two countries issued a

From Earth to Space: China-Pakistan Ties Expand

From page 1

To cope with specific meteorological disasters such as glacial lake outburst floods, monsoon surges and torrential rains in Pakistan, the CMA and relevant departments in Pakistan jointly developed a customized version of the system.

Another example of growing cooperation on the ground is the China-Pakistan Joint Research Center on Earth Sciences (CPJRC), jointly established by the Chinese Academy of Sciences and

joint statement, agreeing to tap into the potential for cooperation. The areas include energy, digital economy, scientific and technological innovation, artificial intelligence, and information and communication.

They also agreed to scale up personnel training, advance trade liberalization, and jointly safeguard the stability and security of industrial and supply chains.

Cooperation in areas ranging from space exploration and Earth sciences to artificial intelligence and the digital economy will continue to expand in the future.

ray in this region.

Cao said: "These ocean-bottom seismometers act like sensitive 'stethoscopes' for the deep sea, capable of continuously capturing natural seismic waves and recording minute tremors within the Earth's crust." Through them, researchers can conduct year-long passive-source ocean-bottom seismic observations to acquire natural seismic signals from this area and its surrounding regions.

This expedition challenges the traditional reliance on the summer season for Antarctic scientific research and provides a valuable model for achieving continuous, year-round observations in the polar regions. Furthermore, international collaboration and data sharing in polar research serve as a global public good, highlighting China's significant contribution to international cooperation in this field.

Xuelong 2 Maps Rare Antarctic Marine Secrets

From page 1

Over the course of 23 days, the team conducted surveys at 41 stations, focusing on three core scientific questions: melting ice shelf, carbon sequestration mechanisms and biological overwintering strategies.

The research team collected over 5,700 seawater samples, 2,289 filter membrane samples and 829 biological samples in total. According to Chen Jianfang, the deputy leader of China's 42nd Antarctic Expedition and chief scientist of the Joint Expedition, preliminary investigations revealed signals of super-cooled water at certain depths near the front of the Amery Ice Shelf and within the Mackenzie Polynya. Low-temperature signals were detected on the northwestern continental slope of Prydz Bay,

and signs of Circumpolar Deep Water intrusion were observed on the northern continental slope. However, it appeared that high-density shelf water was unable to flow off the continental slope during this particular season.

The Joint Expedition also conducted stratified surveys of various biological organisms, thereby providing the crucial data needed to construct a year-round operational model of the Antarctic ecosystem.

High-precision observation network

On the night of April 16, amid the strong westerly winds, the Xuelong 2 crew deployed 28 monitoring buoys in the core regions of mesoscale eddies. This marked the first time China had deployed a network for observing meso-

scale eddies in the Southern Ocean. Mesoscale eddies are crucial for transporting matter and energy, however observational data for autumn and winter remain scarce. The deployment of China's domestically developed 6,000-meter "Deep-Sea Basal" buoy, which made its maiden voyage in the Southern Ocean, will provide the first set of in situ observational data to support research on deep-sea warming.

Domestically produced equipment also played a pivotal role in the 42nd Antarctic Expedition. During the summer phase, team members deployed 15 ocean-bottom seismometers manufactured in China in the waters surrounding the Antarctic Peninsula, thereby establishing China's first ocean-bottom seismic observation ar-



Angewandte Chemie

Spotlighting Innovations that Inspire Chemical Community

By Frank Maaß & Nathalie Weickgenannt

Angewandte Chemie, meaning "applied chemistry" in German, is one of the world's leading journals for the publication of chemical research. With an impact factor of 17 and over 5,000 publications in 2025, it is a high-impact, high-volume journal with a mission to disseminate innovative research from around the globe that drives the advancement of chemistry across all sub-disciplines, from biocatalysis to battery research, from inorganic materials to transition-metal catalysis.

In 2025, the journal recorded more than 40 million full-text downloads, corresponding to over 75 article views per minute. This underscores its position as a central platform for the dissemination of chemical research and reflects the size and diversity of its global readership. For authors, a publication in *Angewandte Chemie* offers broad international visibility within the chemical sciences.

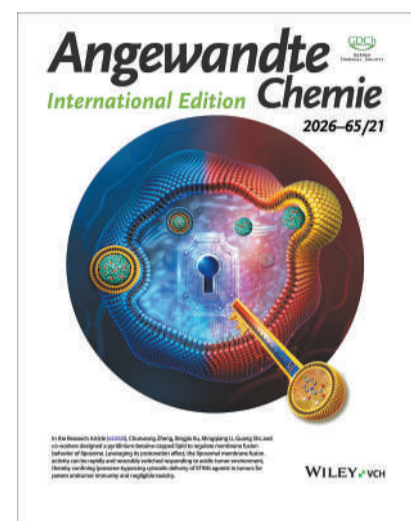
Founded in 1887, *Angewandte Chemie* initially focused on chemical engineering and technical chemistry. In the 1970s, the journal's focus shifted toward fundamental research as it became more international, while it retained its applied roots. Its success story is built on the close collaboration between its owner, the German Chemical Society, and the editorial team at the publisher Wiley-VCH.

Managing growth through editorial expertise

In 2000, *Angewandte Chemie* received around 150 submissions per month. By 2025, this number had risen to nearly 2,500. Handling this volume requires a large editorial team to ensure consistent and rigorous evaluation. The around 40 full-time in-house editors of the journal have extensive research experience across all areas of chemistry and adjacent disciplines, and they work collaboratively in subject-focused teams.

Every manuscript submitted undergoes an initial internal assessment by an editor, often in consultation with the subject team or the editors-in-chief. As the editors evaluate manuscripts, they look for the transformative potential of the research as well as excellent scientific quality and broad relevance that has the potential to inspire the wider chemical community.

Angewandte Chemie serves a large, diverse and international scientific community. The in-house editors closely interact with the members of the journal's Scientific Advisory Committee (SAC) and International Advisory Board, composed of internationally renowned active scientists from across the globe. They act as our eyes and ears in the community and



Front cover of *Angewandte Chemie*, Volume 65, Issue 21. (COURTESY PHOTO)

offer essential strategic guidance.

The current 13 members of the SAC help shape the scientific profile of the journal and provide input on editorial strategy. As active researchers, they bring hands-on experience from the bench into editorial decision-making and are closely involved in difficult decisions and appeals.

Elevating outstanding innovations

The editorial office headquarters are located in Weinheim, Germany, where the editors-in-chief are also based. At the same time, our editorial presence in Canada, China, India, South Korea and the United Kingdom reflects the global nature of chemistry and enables close engagement with researchers on the ground. The China editorial team of 13 editors, based in Beijing and Shanghai, plays a key role in identifying innovative work and maintaining close engagement with researchers.

Through ongoing dialogue and by gathering feedback from authors, the local editors provide responsive editorial support while ensuring that high-quality contributions from the region are evaluated within the journal's rigorous editorial framework.

With the launch of *Angewandte Chemie Novit*, "The Up-Transfer Journal", the *Angewandte Chemie* portfolio introduced a new route to publishing in 2025. Manuscripts originally submitted to *Angewandte Chemie* and rated as exceptional by the reviewers undergo an additional manuscript selection process, identifying a small number of particularly outstanding studies for publication. The SAC members play a key role in this process. As a highly selective journal with limited annual output, *Angewandte Chemie Novit* offers exceptional global visibility and recognition from the research community.

The authors are the editors-in-chief of *Angewandte Chemie*.

Journal Review

Angewandte Chemie stands as one of the most influential and trusted journals in the chemical sciences. Its name carries a rich heritage, yet the journal has evolved far beyond its original scope to embrace the growing interdisciplinary nature of modern chemistry research. Today, it publishes groundbreaking research articles alongside authoritative reviews and highlights that bridge chemistry with physics, biology and materials science. This inclusive and forward-thinking culture is the cornerstone of *Angewandte Chemie*'s enduring success.

China has become one of the largest contributors to *Angewandte Chemie*, verifying both the growing excellence of Chinese chemical research

and the journal's commitment to fostering global scientific exchange. By providing a high-quality platform for rigorous and innovative work, *Angewandte Chemie* empowers researchers worldwide to share discoveries that push disciplinary boundaries.

Looking ahead, I hope *Angewandte Chemie* will continue to champion scientific rigor and cross-disciplinary collaboration, serving as an indispensable resource for the global chemistry community while reflecting the dynamic contributions of Chinese scientists to the field.

— Tang Zhiyong, academician of the Chinese Academy of Sciences, and director of the National Center for Nanoscience and Technology