Editorial

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Element as a mirror - revealing science's essence and distant horizons

Fudi Wang

When the term "Element" resonates in scientific circles - beside lab beakers where molecular reactions unfold, under observatory domes capturing cosmic light, or at hospital bedsides guiding clinical decisions - it transcends the rigid definitions in chemistry textbooks. It is hydrogen, fusing in stellar cores to ignite the universe's first glow; carbon, woven into DNA's double helix to encode life's evolution; iron, bound through hemoglobin to sustain every heartbeat; silicon, arranged into microchips to power the digital era. These tangible elements are the irreplaceable building blocks of matter, and they form the central focus of *Element* - a journal dedicated to uniting fragmented elemental research across disciplines.

RESEARCH FOCUSED ON "ELEMENTS" (THE MATERIAL FOUNDATION): CLEAR DISCIPLINARY SCOPES

We prioritize submissions that explore elements' properties, functions, and applications across five key disciplinary areas - each with distinct, actionable research directions to guide contributors:

- **Life Sciences:** Studies on elemental roles in biological processes, including (but not limited to) metallic ion signaling (e.g., zinc sparks in embryonic development, copper's role in immune cell activation), elemental metabolism (e.g., iron-sulfur cluster assembly in mitochondria, selenium's integration into selenoproteins), and element-dependent cell fate (e.g., ferroptosis, cuproptosis).

- **Medicine & Public Health:** Research linking elements to disease mechanisms and interventions, such as elemental imbalance in pathogenesis (e.g., iron overload in thalassemia, iodine deficiency in cretinism), element-based therapeutics (e.g., arsenic trioxide for leukemia, platinum complexes for cancer), and public health strategies (e.g., selenium-fortified salt for Keshan disease, fluoridated water for dental caries prevention).

- **Chemistry:** Investigations into elemental chemistry, including atomic structure and reactivity (e.g., noble gas compound synthesis, superheavy element stability), catalytic processes (e.g., elemental catalysts in carbon capture, enzyme-mediated elemental transformations), and elemental material design (e.g., metal-organic frameworks for element storage).

- **Environmental & Earth Sciences:** Work on elemental cycles and impacts, such as global elemental circulation (e.g., carbon sequestration in oceans, mercury deposition in ecosystems), geochemical distribution (e.g., selenium-deficient soil mapping, arsenic contamination in groundwater), and elemental effects on biodiversity (e.g., trace elements in pollinator health, heavy metals in aquatic life).

- **Engineering & Materials Science:** Innovations in elemental applications, including functional materials (e.g., silicon-based photovoltaics, lithium-ion battery cathodes), elemental recycling (e.g., rare earth element recovery from e-waste), and industrial elemental control (e.g., heavy metal removal in manufacturing wastewater).

RESEARCH EXPLORING "ELEMENT" (THE FUNDAMENTAL ESSENCE/GENIUS): CROSSING DISCIPLINARY BORDERS

Beyond material elements, "Element" embodies the "fundamental essence" - the "Genius" (as we translate it in Chinese) of scientific inquiry. We welcome groundbreaking work that probes the core logic of any discipline, even without direct ties to traditional elements. Key disciplinary areas here include:

- **Life Sciences:** Studies on foundational biological mechanisms, such as the "Genius" of cell fate determination (e.g., stem cell differentiation hierarchies), genetic information transmission (e.g., DNA repair mechanisms), and intercellular communication (e.g., signal transduction cascades).

- **Medicine:** Research into the "Genius" of disease origins and treatments, including the root causes of chronic illnesses (e.g., metabolic syndrome's molecular triggers), precision medicine targets (e.g., genetic markers for drug response), and regenerative therapy principles (e.g., tissue engineering scaffolds).

- **Physics & Astronomy:** Explorations of cosmic and quantum "Genius," such as the origin of elements in the universe (e.g., stellar nucleosynthesis), quantum behavior of fundamental particles (e.g., Higgs boson's role in mass generation), and planetary habitability's elemental prerequisites (e.g., iron cores for magnetic fields).

- **Chemistry:** Investigations into the "Genius" of matter transformation, including reaction kinetics (e.g., enzyme catalytic efficiency limits), chemical bonding principles (e.g., hydrogen bond dynamics), and synthetic chemistry fundamentals (e.g., green chemistry for sustainable synthesis).

- **Agronomy & Environmental Engineering:** Work on the "Genius" of ecosystem and agricultural sustainability, such as soil-plant elemental symbiosis (e.g., phosphorus uptake in crops), climate-resilient agriculture (e.g., elemental regulation of drought resistance), and ecological restoration (e.g., elemental remediation of degraded lands).

Science's greatest leaps occur when we connect *elements* - the material building blocks - to their genius - the fundamental essence. Mendeleev's periodic table, for example, organized the elements to reveal the genius of chemical periodicity; Marie Curie's discovery of radium unveiled the *genius* of radioactivity, laying the foundation of nuclear science; today's research on ferroptosis links iron, an element, to the genius of regulated cell death. As Carl Sagan noted, "*We are made of star-stuff*" - a reminder that our quest for elements is inherently a quest for the universe's genius.

Element aims to serve as a bridge between

these two realms: a platform where researchers studying iron metabolism and those decoding quantum mechanics can converge, united by their pursuit of fundamentals. Whether your work explores a material element's role in health or a discipline's core genius, this journal offers a space to shape the future of elemental science.

We invite colleagues worldwide to join us - submitting work that transforms elemental insights into genius discoveries, and together building a journal that honors both the tangible and the profound.

DECLARATIONS

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Fudi Wang[1,*]
Department of Public Health, School of Medicine, Zhejiang University, Hangzhou 310058, Zhejiang, China.

*Correspondence to: Prof. Fudi Wang, Department of Public Health, School of Medicine, Zhejiang University, Hangzhou 310058, Zhejiang, China. E-mail: fwang@zju.edu.cn

Fudi Wang, is a Qiushi Distinguished Professor at the Zhejiang University School of Medicine. He is a recipient of the National Science Fund for Distinguished Young Scholars, a scholar of the Ten Thousand Talent Program, and the Chief Scientist of a National Key Research and Development Program. He has deep expertise in the fields of ferroptosis and metal ion metabolism and has proposed the "ferroptosis signal" theory and established the new discipline of "Ferrology," positioning him as a leading scholar in the field. His team focuses on the mechanisms of ferroptosis and translational medicine and has achieved significant breakthroughs in recent years in targeting ferroptosis for the prevention and treatment of cardiovascular and liver diseases. He has published over 260 papers in top-tier journals such as *Nature* and *Cell Metabolism*, including 31 cover articles, with a total impact factor approaching 3000, nearly 25,000 citations, and an H-index of 80. His research findings have been highlighted in leading international journals and incorporated into clinical guidelines.