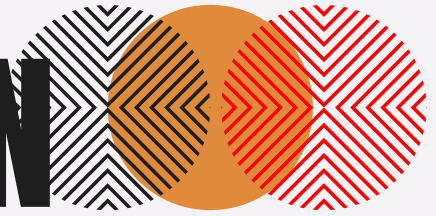# A TRUSTWORTHY ECOSYSTEM FOR THE FUTURE OF SCIENCE
共建可信赖的科研生态

WHITE PAPER: THE 3RD SINO-SWISS RESEARCH INTEGRITY WORKSHOP
第三届中瑞科研诚信研讨会白皮书

SWISSNEX IN CHINA
FRONTIERS

INTRODUCTION

In the context of the 75th anniversary of diplomatic relations between Switzerland and China, Swissnex in China, Frontiers, the Embassy of Switzerland in China, the National Science Library of the Chinese Academy of Sciences and the China Science and Technology Exchange Center jointly hosted *Towards a Trustworthy Research Ecosystem: The 3rd Sino-Swiss Research Integrity Workshop* at the Embassy of Switzerland in Beijing, a part of the Tech&Ethics initiative of Swissnex in China.

The workshop brought together policymakers, academic experts, and industry leaders from both countries to address emerging challenges and share best practices in research integrity. It aims to provide valuable insights for fostering an ethical and trustworthy research ecosystem, while enhancing mutual trust, dialogue, and collaboration—especially among young scholars—in research integrity and scientific ethics.

As H.E. Jürg Burri, Ambassador of Switzerland to China emphasized during his welcome address, mutual understanding and collaboration in science and technology are vital for addressing transnational ethical issues.

Experts from prominent Chinese and Swiss institutions — including the Ministry of Science and Technology's Science and Technology Evaluation Center, the Swiss Competence Center for Research Integrity, the National Science Library of the Chinese Academy of Sciences, Tsinghua University, Peking University, ETH Zurich, and Zurich University of Applied Sciences—presented their cutting-edge research insights and discussed best practices towards trustworthy AI. Key takeaways from the workshop are the following:

THEME 1: FUTURE OF AI IN ACADEMIA

1. ROLE OF AI IN ACADEMIA – PERSPECTIVES ON GOVERNANCE AND INTEGRITY

Chinese scholars acknowledge China's centralized approach to research integrity governance, with policies from government bodies like the Ministry of Science and Technology and Ministry of Education. The update of national regulation on integrity and ethics is usually linked with severe academic misconduct scandals. Guided by the national regulatory framework, universities and research institutes establish and implement their own practical measures.

Swiss participants highlighted their country's decentralized approach where research integrity misconduct is managed through university-specific internal mechanisms, which are subject to different cantonal and federal regulations. Switzerland aligns its research integrity governance framework with the European Code of Conduct for Research Integrity—a framework that emphasizes honesty, accountability, and reproducibility as essential pillars of scientific credibility. The Swiss Academies of Arts and Sciences published the Code of Conduct for Scientific Integrity in 2021 as a guideline.

> *"Research integrity is a global issue that no single institution can tackle alone. It requires strengthened collaboration among the international research community, including China and Switzerland, to build consensus through such seminars and jointly establish a trustworthy research ecosystem."*

2. AI'S DUAL IMPACT ON RESEARCH – INNOVATION VS. ETHICAL CHALLENGES

While AI can help address biases and barriers in research, including language communication problems, knowledge sharing and ensuring the inclusiveness of research scope, there are limitations. AI algorithms themselves can contain biases and are not magic bullets. There is a risk of creating new research disparities where early AI adopters gain advantage. And responsibility dilemmas exist regarding who bears accountability for AI generated content and AI-assisted projects. Scholars emphasized the need for clear guidelines to delineate roles, responsibilities, and ethical accountability when AI systems contribute to research outputs.

> *"AI holds potential in three areas for overcoming biases in scientific research. First, its potential in addressing data challenges, offering support in language and modal analysis. Second, its potential in bias detection, aiding in identifying statistically significant anomalies and uncovering overlooked research questions. Third, its potential in advancing scientific openness—whether by facilitating linguistic communication, sharing knowledge resources, or refining and reconstructing knowledge systems distributed across global nodes—AI will unlock new opportunities."*

THEME 1: FUTURE OF AI IN ACADEMIA

3.TRANSFORMING RESEARCH PARADIGMS WITH AI

Innovative models such as AI-driven research initiation present fascinating opportunities to reshape academic publishing, allowing AI to proactively define research topics and allocate resources. However, challenges such as monopolized data access, professional integrity in data management, and concerns over fair returns for contributors remain significant barriers. Transparency, robust peer-review mechanisms, and equitable collaboration are seen as foundational strategies to ensure ethical integration of AI.

Recommended best practices involve fostering transparency akin to a "glass kitchen" model to rebuild trust, orderly reuse of data, and ensuring reasonable returns for contributors. AI tools should facilitate rapid peer review, topic forecasting, resource identification, hotspot monitoring, and accurate communication, all while improving efficiency and supporting robust collaboration among authors, reviewers, and editorial teams.

"In our current academic and research landscape, we're witnessing what I call holistic research—where different fields collaborate and intersect extensively. This presents a new challenge: all disciplines must conduct their research on the same platform."

4. COMBATTING RESEARCH MISCONDUCT IN THE ERA OF AI

The widespread misuse of AI and evolving fraudulent practices (e.g., paper mills, fake peer reviews and image manipulation) threaten the credibility of research. These issues, which undermine public trust in science and tarnish the reputation of the publishing industry, demand proactive solutions. Scholars emphasize the importance of multipronged defense strategies, including AI-powered tools for misconduct detection, harmonized ethical codes, and coordinated international collaboration.

THEME 1: FUTURE OF AI IN ACADEMIA

A key initiative by Frontiers is AIRA, the AI-powered screening assistant, which analyzes large datasets, flags patterns of misconduct, and assigns risk scores, ensuring fraudulent submissions are identified early and passed on for human evaluation. The purpose of the AI tool is not to replace human editors, but quite the contrary, to support humans in making better-informed decisions.

> *"Frontiers further strengthens AIRA system by integrating independent tools (such as Cactus and Clear Skies) and by running a specialized research integrity auditing unit that uncovers more complex, coordinated misconduct. Feedback from authors and editors shows high satisfaction and rising quality metrics, supporting the claim that this combined human-AI approach effectively protects the integrity of the scientific record."*

5. GOVERNANCE AND INSTITUTIONAL RESPONSES TO ACADEMIC PRESSURE

Intense publication-driven evaluation systems are identified as underlying catalysts for academic misconduct. Efforts to regulate integrity through comprehensive disclosure protocols, adaptable standards, and institutional reforms are viewed as essential. Collaborative frameworks across regions and industries remain critical to adapting to misconduct risks in increasingly technology-driven academic environments.

Swiss experts identified a lack of coordinated reporting mechanisms and data-sharing practices as a challenge of recording misconduct cases. Swiss scholars emphasized the need to establish a comprehensive disclosure, which has led to the creation of the Competence Center for Scientific Integrity Switzerland (KWIS) in 2025. The center will collect all reported academic misconduct cases and will be able to recommend academic institutions for best practices.

> *"The National Competence Center on Research Integrity is the body to which all universities and all organizations funded through that federal act on research must report any research integrity proceedings that they have initiated sanctions that they have imposed and measures that they are implementing to improve research integrity awareness."*

THEME 2: ETHICAL CONSIDERATIONS OF AI IN LIFE SCIENCES

1. ETHICAL CHALLENGES IN AI FOR LIFE SCIENCES

The integration of AI into life sciences research raises ethical concerns such as informed consent, data management, and balancing risks versus benefits, particularly in areas like brain-computer interfaces and clinical decision-making algorithms. For instance, decision-making algorithms used in clinical settings have the potential to enhance diagnostic accuracy, yet they pose risks related to user autonomy and oversight when system predictions are incorrect or poorly understood.

Scholars emphasize the importance of frameworks that address user autonomy, algorithm transparency, and accountability for system inaccuracies, ensuring ethical oversight in clinical applications.

"In real-world healthcare projects, around 90% of LLM-based prototypes never reach production. LLMs are widely promoted for reducing administrative burden, democratizing medical knowledge, accelerating research, and overcoming language barriers, but these promises are often superficial. LLMs are just tools, not a silver bullet, and only useful in some narrow, well-chosen areas."

2. SECONDARY DATA USAGE AND GLOBAL COLLABORATION CONCERNS

A particular concern raised was secondary data usage, especially given the volume of private health information processed in AI systems. There is a need to develop an ethical review system where a multidisciplinary team would assess clinical protocols. Recommendations also include to adopt a dynamic informed consent process, so patients are engaged throughout the process. Scholars proposed an assessment framework based on clinical, ethical, legal, and sociocultural factors, taking into consideration cross-cultural differences.

Collaborative international efforts should focus on transparent data sharing, cross-border accountability mechanisms, and evaluation of AI models' clinical implications.

"We really need to focus on what's the quality of the data. It's a topic for research institutions, researchers, and it happens also in the production process."
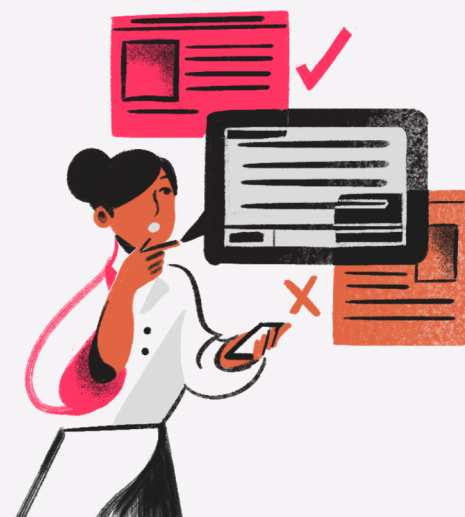
THEME 2: ETHICAL CONSIDERATIONS OF AI IN LIFE SCIENCES

3. PRACTICAL ETHICAL FRAMEWORKS FOR PRECISION MEDICINE

Traditional ethical principles alone are insufficient for guiding responsible AI development in healthcare contexts. An example presented by the Swiss scholar is a participatory research methodology that integrates formal ethical analysis with practical stakeholder needs, as demonstrated in the PRECISE4Q project's "Reflective Framework for Big Data Health Research." This framework emphasizes inclusive co-creation from the beginning, ensuring societal alignment, leveraging collective expertise for ethical innovation, and enhancing patient outcomes by prioritizing healthcare professional and patient perspectives throughout the development and deployment process, thereby enabling thorough assessment of risks, benefits, and potential pitfalls associated with precision medicine tools.

"The main purpose of the framework is to stimulate discussion and reflection among the consortium partners, allowing them to identify and anticipate potential ethical challenges that might jeopardize the successful translation of the Precise4Q tools into clinical practice. In doing so, the framework aims to ensure that decision-making during the development and deployment phase is closely aligned with core ethical values and principles of patient-centered care."

THEME 2: ETHICAL CONSIDERATIONS OF AI IN LIFE SCIENCES

4. CHALLENGES WITH LARGE LANGUAGE MODELS (LLMS) IN HEALTHCARE

Despite their promise, LLMs face significant hurdles in clinical settings, including unreliable outputs, high costs, and unmet expectations like reducing administrative burdens. Professionals often expend additional effort verifying outputs due to inaccuracies and inadequate handling of complex datasets.

There is a risk of creating inequitable health systems based on access to reliable AI tools versus trained professionals. Misallocation of resources toward AI in underfunded healthcare systems exacerbates disparities.

Best practices and recommendations emphasize that LLMs should be seen as tools for specific, well-defined applications rather than catch-all solutions. Ethical considerations, such as the environmental impact of large data centers and the questionable handling of intellectual property during model training, must also be addressed. For example, Switzerland offers an innovative approach to open and transparent data training, which can serve as a model for ethical AI development. Moreover, care must be taken to prevent the risk of creating two-tier health systems—one relying on unreliable AI tools for underfunded communities and another with access to trained professionals. Misallocation of funds toward AI tools in already strained healthcare systems further underscores the need for cautious integration. Ultimately, stakeholders are encouraged to evaluate the benefits rigorously and account for financial and operational realities, avoiding the hype fueled by commercial pressures for rapid AI adoption.

"Artificial intelligence is moving very, very rapidly, but the process for developing guidance and use cases is a process which moves relatively slowly. [...] The scientific community itself is not particularly well informed about AI, or the potential of AI. And there is a very high level of anxiety among the scientific community about the potential misuse of AI."

KEY CONSENSUS

- Both Chinese and Swiss participants acknowledged the opportunities and the challenges imposed by AI in academia, stressing the need for collective governance frameworks. Transparency and reproducibility were identified as shared priorities in maintaining trust across academic and healthcare contexts.

- Mutual agreement was evident on the urgency of interdisciplinary input/multi-stakeholder engagement when developing ethical guidelines for the use of advanced technologies, including but not limited to AI and Brain Computer Interface. By combining technological advancements with ethical deliberations, both nations aim to tackle complex dilemmas like AI accountability and secondary data usage.

- Participants agreed on the importance of fostering transnational dialogue to ensure consistent ethical applications of AI and other emerging technologies, and the need to ensure cultural differences have been addressed. Knowledge exchange is a crucial way of mutual learning.

WAY FORWARD

By addressing the complex interplay between AI technologies and ethical frameworks, the Sino-Swiss Seminar on Research Integrity and Bioethics has established a strong foundation for future collaboration. With shared commitments to transparency, reproducibility, and accountability, China and Switzerland have the opportunity to lead global efforts in shaping robust and ethically sound practices in life sciences research.

> *"Given the increasingly severe challenges to academic integrity, researchers, publishers, and relevant institutions must collaborate. Universities and research organizations also need to reform and refine their performance evaluation systems to avoid undue emphasis on publications or impact factors."*

> *"Current research and publishing face contradictions amid overwhelming information, indistinguishable authenticity, eroding trust, and "passive open data." On one hand, AI creates content dilemmas. On the other, it is entrusted to become the solution. Traditional publishing has long served as a bridge to mend distrust between authors and readers. Yet with AI now deeply embedded in writing, peer review, and dissemination, academic publishing risks becoming a process where "AI writes, AI reads, and humans free ride" if no changes are made."*

APPENDIX: AGENDA

14:30 **Welcome Remarks**
Jürg BURRI, Ambassador of Switzerland to China
Xiwen LIU, President, National Science Library, Chinese Academy of Sciences
Frederick FENTER, Chief Executive Editor, Frontiers
Xiaowei ZHANG, European Division, China Science and Technology Exchange Center

14:50 **Keynote 1: Sino-Swiss Framework for Tech Ethics and Research Integrity**
Xiaoyong SHI, National Center for Science and Technology Evaluation (NCSTE)
　　　　　　　Ministry of Science and Technology
Edwin CONSTABLE, Founding President
　　　　　　　Competence Center for Scientific Integrity Switzerland

15:25 **Keynote 2: AI for Publishing: Between Innovation and Authenticity**
AI's Role in Safeguarding Research Integrity: Quality and Integrity at Scale
Julie MO SVALASTOG, Research Integrity Manager, Frontiers
AI-driven Data Pennant: Operating Models for Sci-tech Academic Journals
Zheng MA, Researcher, National Science Library, Chinese Academy of Sciences

16:10 **Keynote 3: AI for Good: Responsibility and Practice**
Safeguarding Academic Integrity and Public Trust in the AI-Powered Research Era
Jianbin JIN, Professor of Tsinghua University and Director of Tsinghua University Library
A Reflective Approach for AI in Personalized Medicine
Dr. Sara KIJEWSKI, Health Ethics & Policy Lab, ETH Zurich
Correcting Research Bias? The Potential and Limits of Artificial Intelligence
Li TIAN, Dean, School of Journalism and Communication
　　　　　Vice Dean of the School of New Media
　　　　　Director of the Institute for Internet Development Studies, Peking University
Responsible Use of Large Language Models and Intelligent Agents
Václav PECHTOR, Researcher AI & Data Engineering
　　　　　　　ZHAW School of Management and Law
Ethical Review of Clinical Research on Brain-Computer Interfaces
Dr. Xueqin WANG, Director of Ethics Office
　　　　　　　No.6 Hospital of Peking University Health Science Center

17:10 **Panel Discussion: Future of Academia – the Changing Role of AI?**
Moderator:
Junpeng YUAN, Professor at National Science Library, CAS
　　　　　　Director, Research Integrity and Responsible Innovation Committee
　　　　　　of the Chinese Association for Science of Science and S&T Policy
Panelists:
Fred FENTER, Chief Executive Editor, Frontiers
Michael CONRAD, AI Solution Architect, Machine Learning Engineer
　　　　　　　Swiss Center for Design and Health
Yang XU, Professor, Department of Information Management, Peking University

CONNECTING TOMORROW