Recommended Checklist for Specialized Review of Academic Misconduct in Chinese Sci-Tech Journals (2025 Edition)

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Abstract: To systematically enhance the ability of Chinese sci-tech journals to identify and prevent academic misconduct manuscripts, and to safeguard the solemnity and fairness of academic publishing, this Specialized Review Recommended Checklist is hereby formulated. The checklist covers key links such as formal review, author identity verification, content logic review, image data verification, and peer review process supervision, comprising 21 core review points that focus on typical misconducts like plagiarism, data fabrication, duplicate publication, and improper authorship. Its core innovation lies in the first systematic structuring of a specialized review process for preventing academic misconduct manuscripts, translating abstract academic integrity principles and complex identification theories into operational elements. This provides journal editors with a set of standardized and procedural verification tools and decision-making bases, realizing a paradigm shift from relying on individual experience to following standardized norms. The checklist aims to strengthen journals' pre-review prevention mechanisms, enhance editors' review awareness and efficiency, effectively reduce the risk of publishing academically misconducted papers, and provide a systematic solution for upholding academic integrity and ensuring journal quality.
Key words: Academic Misconduct; Preventive Measures; Review Checklist; Sci-Tech Journals; Publishing Ethics

Academic misconduct typically encompasses fabrication, falsification, and plagiarism of data, while duplicate submission, appropriation of academic achievements, and fabrication of academic credentials are also included within its scope[1-2]. Such misconduct occurs across all stages of scientific research, including experimentation, grant applications, and academic publishing.

In July 2022, *Science* published an investigative report alleging data irregularities in multiple papers authored by Sylvain Lesné of the University of Minnesota. Among these, a 2006 Alzheimer's-related study published in *Nature*—which had garnered over 2,300 citations—was retracted due to image manipulation[3].

In recent years, the National Natural Science Foundation of China (NSFC) has publicly disclosed academic misconduct cases involving dozens of scholars from over ten renowned domestic universities and research institutions. The reported violations encompass diverse forms of misconduct, including but not limited to: soliciting favors from peer reviewers, plagiarism, image misuse, data fabrication, false authorship attribution, and duplicate publications. To address such academic misconduct, China has implemented a series of national governance policies targeting research integrity violations.

In 2022, the Ministry of Science and Technology and 21 other departments issued the Investigative Procedures for Research Misconduct[4], defining research misconduct, delineating responsibilities for addressing violations, investigation procedures, and disciplinary measures. That same year, the Supervisory Committee of the National Natural Science Foundation of China promulgated the Investigation and Handling Measures for Research Misconduct in NSFC

Projects[5], specifying its scope of application, definitions of research misconduct, investigation procedures, disciplinary actions, implementation details, and protocols for appeals and reviews.

In 2023, the Department of Supervision under the Ministry of Science and Technology issued the Guidelines for Responsible Research Practices[6], covering research topic selection and implementation, data management, literature citation, authorship attribution, research output publication, peer review, ethical review, academic exchange and collaboration, intellectual property protection, training and mentoring, as well as oversight and administration.

In 2024, the Ministry of Education issued the Implementation Rules for Investigating and Handling Academic Misconduct in Higher Education Institutions[7] and the Guiding Opinions on Strengthening Research Integrity and Academic Misconduct Governance in Higher Education Institutions[8]. The former applies to the investigation and handling of academic misconduct occurring during project application, evaluation, implementation, and conclusion processes, as well as in academic activities such as the publication and application of research outputs including papers, patents, and monographs. The latter provides eight programmatic guidelines. While most of these policies address academic misconduct post-publication, certain provisions have comprehensive coverage of the entire research process. However, they lack detailed criteria for identifying specific manifestations of academic misconduct. Consequently, there is an urgent need for the publishing sector to establish guiding protocols for screening manuscripts pre-publication and in-process.

Based on China's recent academic integrity policies, the Academic Integrity and Copyright Committee of the Chinese Association of University Science and Technology Journals has developed the Recommended Checklist for Specialized Review of Academic Misconduct in Chinese Sci-Tech Journals (2025 Edition). This document integrates internal case studies and expert consultations. It should be noted that expecting journal editors and reviewers to detect all research misconduct solely through manuscript submissions is unrealistic. However, most academic misconduct leaves identifiable traces, and significant progress remains highly viable in curbing such practices during the peer review process[9-10].

This checklist presents the first systematically organized set of specialized review elements for preventing academic misconduct in manuscripts. It translates theoretical principles into actionable, operational components. This is significant for advancing academic integrity in world-class journals, safeguarding the quality and reputation of scientific publications, and promoting the healthy development of the academic ecosystem. Furthermore, it represents a crucial step in transitioning Chinese scientific papers from quantity expansion to quality enhancement. The compilation of this checklist received substantial support from the Chinese Association of University Science and Technology Journals.

1.Research Objects and Methods

Based on the document review and expert consultation, this Committee has comprehensively analyzed domestic publishing regulations, including: Law of the People's Republic of China on Scientific and Technological Progress[11], Rules for Investigation and Handling of Research Misconduct[4], Measures for Investigating and Handling Research Misconduct in National Natural Science Foundation Projects[5], Guidelines for Responsible Research Conduct (2023)[6], Academic Publishing Specifications—Definition of Academic Misconduct in Journals[12], and international

publishing regulations such as: American Chemical Society's ACS Guide to Scholarly Communication[13], American Physical Society's APS Ethics Guidelines[14] and Procedures for Handling Ethics Complaints[15], IEEE's Code of Ethics[16], ICMJE Recommendations[17], Guidelines by the Committee on Publication Ethics (COPE)Beyond conventional review processes, we have established an Academic Misconduct Review Procedure (Figure1) and Key Review Criteria (Table1) to conduct Special Audits for Academic Misconduct on manuscripts, thereby mitigating publication risks. The applicable scope covers original manuscripts submitted to Chinese scientific journals including mixed Chinese－English language journals.

To improve and objectively evaluate the review criteria, the Delphi method[18] was employed to conduct two rounds of questionnaire surveys. Building upon a comprehensive literature review, domestic and international academic misconduct case samples were analyzed. Through group discussions, an expert consultation form was developed comprising four sections: Project Introduction: Background, content, and objectives Guidelines and Notices: Instructions for completion and key considerations Expert Information: Gender, educational background, institutional affiliation, disciplinary field, experts' self-assessed basis for judgment, and familiarity with the subject matter Recommended Indicators: Metrics compiled from preliminary expert consultations.

The expert authority coefficient (Cr) is calculated according to Reference 18. Familiarity is categorized into: very familiar, relatively familiar, moderately familiar, slightly familiar, and unfamiliar, assigned scores of 0.9, 0.7, 0.5, 0.3, and 0.1 respectively, representing the expert's familiarity with the subject. The judgment basis measurement scale adopts a three-level scoring system: Practical Experience (substantial, moderate, limited), Theoretical Analysis (substantial, moderate, limited), Reference to Domestic/International Data (substantial, moderate, limited), Intuitive Judgment (substantial, moderate, limited); Assigned scores correspond as: Practical Experience (0.5, 0.4, 0.3), Theoretical Analysis (0.3, 0.2, 0.1), Reference to Domestic/International Data (0.1, 0.1, 0.1), Intuitive Judgment (0.1, 0.1, 0.1).

2. Survey Results

2.1 Results of Expert Consultation via the Delphi Method

Thirty experts were invited for evaluation, all of whom are editors of Chinese scientific and technological journals from various provinces across the country. In the first round of the survey, 30 questionnaires were distributed and all 30 were retrieved; the expert positive coefficient (Y) stood at 1, and the coordination coefficient (C_r) was (0.851 7±0.068 9). The C_r of all experts was ≥ 0.7, and their responses were all included in this study. In the second round of the survey, 30 questionnaires were distributed and 30 were retrieved.

2.2 Construction of Academic Norms and Systems

In the expert consultation, the vast majority of experts held the view that, to prevent manuscripts involving academic misconduct from entering the publishing system, it is necessary not only to formulate a clear review and recommendation checklist, but also to carry out the construction of academic norms and systems.

Each editorial department shall formulate and publish journal ethical norms, including publishing standards such as the responsibilities of authors, editors, reviewers and publishing institutions. It shall be clearly stipulated in the Instructions to Authors that zero tolerance is

adopted for academic misconducts such as plagiarism (of text and ideas), appropriation, multiple submissions of the same manuscript, duplicate publication, data falsification, image tampering, improper authorship (guest authorship and ghost authorship) and false citation; specific measures for dealing with academic misconducts of different natures and severities shall also be clearly defined, such as manuscript rejection, warning, notification to the affiliated institution, and inclusion in the blacklist[19].

Each editorial department shall implement the Author Contribution Statement system, requiring that when a manuscript is submitted by multiple authors, a description of each author's contribution to the manuscript must be provided (e.g., Author A is responsible for experimental design, Author B for data collection, Author C for manuscript writing, etc.). All authors shall be required to review the full content of the manuscript and consent to the submission prior to submission[19]. The Conflict of Interest Statement system shall be refined, mandating authors to disclose all financial and non-financial interests that may affect the research results and the impartiality of peer review.

At the manuscript submission stage, each editorial department shall require the corresponding author to sign a legally binding Copyright Transfer and Academic Integrity Commitment Letter on behalf of all authors, affirming the originality and authenticity of the paper. Meanwhile, the corresponding author shall be informed of the responsibility to conduct preliminary review of the initial submission and proofreading of the final draft [19]. In addition, editorial departments should strive to shorten the manuscript publication cycle and maintain smooth communication with authors, so as to minimize the occurrence of duplicate submissions caused by excessive delays in manuscript processing[20].

2.3 Recommended Checklist

The "Recommended Checklist for Specialized Review of Academic Misconduct in Chinese Sci-Tech Journals" covers the entire process of the three-review and three-proofreading system. Its review scope includes both full-text content and partial key elements, with distinct review levels assigned to different checkpoints. L1 refers to manual retrieval, where judgments can be made through simple comparison. L2 means that certain technical tools are required—such as plagiarism checking, text review via specialized software, or image comparison—before a judgment is reached in combination with manual verification. L3 indicates that, on the basis of L1 and L2 technical methods, the involvement of more professional personnel or advanced technical tools is needed. A comprehensive judgment can only be finalized after integrating manual comparison and conducting in-depth analysis (see Figure 1 and Table 1).
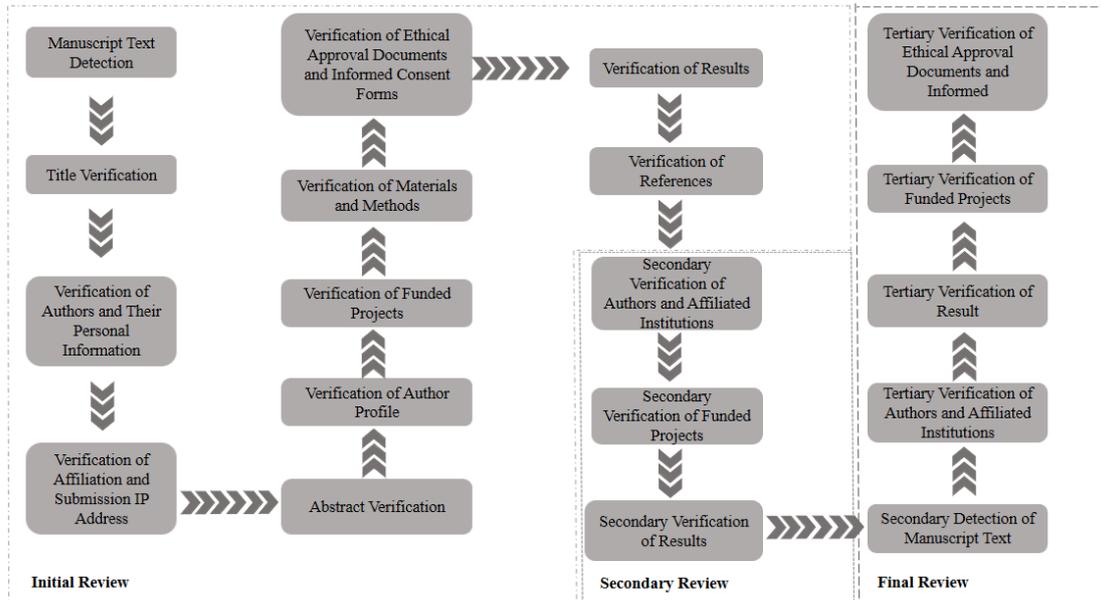
Fig. 1 Special Review Process for Specialized Review of Academic Misconduct in Chinese
Sci-Tech Journals

Table 1 Recommended Checklist for Specialized Review of Academic Misconduct in Chinese Sci-Tech Journals

Review Node	Audit Position/Task	Core Review Points	Audit Level
Initial Review	1. Manuscript Text Detection	Threshold of Manuscript Text Similarity Ratio: Review≤20%，Article≤15%; Artificial Intelligence Generated Content(AIGC): most institutions set it at ≤ 30%; Locations of text similarity overlaps; Published papers similar to the submitted manuscript Manuscript tracking.	L3
	2. Title Verification	Retrieval and comparison of chinese and english titles. Verify whether there is homogeneous logical sequence in the titles of centrally submitted manuscripts. Compare the linguistic features of manuscripts.	L1
	3. Verification of Authors and Their Personal Information	The regularity in the naming of authors' registered email addresses, usernames and passwords; the validity of phone numbers and ID card numbers. Whether the submitter is included in the list of authors of the paper. Whether there are any records of retraction, disciplinary action for dishonesty, or academic questioning. If the author does not use an institutional email address, it is necessary to trace the email addresses used in the author's previously published papers. Contact the author by phone to observe whether they can respond independently, as well as verify details related to the manuscript.	L2
	4. Verification of Affiliation and Submission IP Address	Whether the research background of the authors matches their affiliations. Whether the multi-author manuscripts come from affiliations of different natures with significant disciplinary differences. Whether the submission IP address is consistent with the IP address of the affiliated institution.	L2
	5. Abstract Verification	Whether the key data is consistent with that in the main text.	L1
	6. Verification of Author Profile	The author profiles of the manuscripts submitted recently have not been written in accordance with the requirements of the journal. It is necessary to review whether these profiles follow an identical logical structure.	L2
	7. Verification of	Review the timeliness of the funded projects, the relevance of the funding content, and the correlation between the project	L2

		Funded Projects	principal investigators and the manuscript authors.	
		8. Verification of Materials and Methods	Search the database for the special reagents and equipment used in the manuscript, and check whether there are similar papers that have already been published. Whether there is any flaw in the research design. Whether there is a mismatch between the research methods and the conclusions. Whether any prohibited material is adopted. Whether the principle of confidentiality is violated.	L3
		9. Verification of Ethical Approval Documents and Informed Consent Forms	Prospective studies shall complete clinical trial registration. Check whether the content of the ethical approval documents and informed consent forms is relevant to that of the manuscript. Whether the approval/signature date is reasonable. Whether the seal is clear. Whether there is any trace of forgery on the seal. Whether the approving institution is the same as the author's affiliated institution.	L2
		10. Verification of Results in Text and Tables	Verify by cross-checking the key data in the abstracts. Focus on verifying whether the decimal places of the data and the sample size meet the requirements and are consistent throughout the manuscript, and cross-check the consistency between the data in the tables and the textual descriptions. Check whether the standard deviation of the data is reasonable. If the standard deviation of the data is excessively large or small to an unreasonable extent, it should be suspected that the statistical method has been misapplied or the data has been falsified. Authors are required to provide the values of the test statistics, and the consistency between the test statistics and the P-values shall be verified.	L1
		11. Verification of Results in Figures	Check whether there are discontinuous noise spots, color bands or cloning marks in the image background; whether there are knife-edge sharp edges or feathering halos at the edge splicing positions; and whether the magnification of different areas in the same image is consistent. Sample Images: Check whether the samples have been reused, partially replaced, or photographed from different angles and presented as new results. Microscopic Images: Check for local image duplication, removal of background noise, consistency between the fluorescence signal intensity and the biological characteristics of the sample, and consistency between the scale bar markings and the actual magnification. Electrophoresis Images: Check whether the bands have blurred	L3

		or jagged edges, whether the brightness or contrast has been adjusted, whether any bands have been deleted or added, and whether the molecular weight markers have been forged.	
	12. Verification of References	Verify that the serial numbers, authors, publication years and page numbers of the citations in the main text are completely consistent with those in the reference list at the end of the document, so as to ensure the consistency of citations. Verify item by item in the database using information such as DOI. Verify whether the content cited in the manuscript is relevant to the references.	L1
Seconda ry Review	13. Secondary Verification of Authors and Affiliated Institutions	Verify whether the number of authors and affiliated institutions has been increased or decreased. Verify whether the order of authors and affiliated institutions has been altered. Verify whether a corresponding author is to be added.	L2
	14. Secondary Verification of Funded Projects	Verify whether to add funding support. Verify whether the newly added funding content is relevant to the manuscript and whether the funding was obtained after the submission date.	L2
	15. Secondary Verification of Results	Verify whether the revised text, tables and figures contain any violations, falsifications or unreasonable content.	L3
Proofre ading	16. Secondary Detection of Manuscript Text	Verify the newly added text similarity rate and newly added AIGC content. Verify the locations of duplicated content in the text similarity check. Verify published papers similar to the submitted manuscript. Verify whether the manuscript tracking process reveals any new cases of duplicate submission.	L3
	17. Tertiary Verification of Authors and Affiliated Institutions	The key points for authors and affiliations are the same as those in the secondary verification.	L1
	18. Tertiary Verification of Abstract and Results	The key points for abstract and results are the same as those in the secondary verification.	L3
	19.	The key points for funded projects are the same as those in the	L1

	Tertiary Verification of Funded Projects	secondary verification.	
	20. Tertiary Verification of Ethical Approval Documents and Informed Consent Forms	The key points for ethical approval documents and informed are the same as those in the secondary verification.	L1
Others	21. Recommended List of Other Review Items	A number of papers submitted intensively within one day from the same IP address or even the same account. The payment accounts for manuscripts from different provinces and institutions are the same; the royalty collection accounts are also the same.	L1

Notes: L1 refers to manual retrieval, where a simple comparison is sufficient for judgment; L2 refers to cases that require the use of professional tools combined with manual comparison for judgment; L3 refers to cases that require the involvement of more specialized personnel or technical means, on top of the technical methods adopted in L1 and L2, and then conduct a comprehensive analysis through manual comparison.

3. Discussion

3.1 Key Review Points in initial review

1）Text similarity check

Upon receiving submitted manuscripts, the editorial office shall conduct a text similarity check. It is recommended to set a text similarity rate threshold: the threshold shall be ≤ 20% for review articles and ≤ 15% for research articles (articles).

If the text similarity rate exceeds the threshold, an analysis shall be carried out on the sections with excessive similarity. If the excessive similarity occurs in the results section, especially with lengthy duplicated texts, duplicate publication shall be highly suspected; if it appears in sections such as the abstract, introduction and discussion, plagiarism shall be suspected; if it is found in the materials and methods section, improper citation shall be considered.

Even for manuscripts with a low text similarity rate, the editorial office needs to verify similar papers identified by the similarity check platform, and determine whether they are duplicate submissions of the author's or their research team's previously published works without proper declaration. Focus shall be placed on comparing the core data and arguments of similar papers, including research objects, research methods and technical routes, research results, and references[17-18]. If the research objects are patients, the source and quantity of the patients shall also be compared.

In addition, attention shall be paid to such plagiarism methods as plagiarism through Chinese-foreign language translation, misappropriation of others' viewpoints or data with minor modifications, and conversion of others' textual content into figures [19].

Beyond the above-mentioned identification of duplicated textual content, some similarity check platforms also offer a "manuscript tracking" function [19], which provides clues about potential duplicate submissions to assist editors in making determinations.

2）AIGC detection

Editorial offices with adequate resources may conduct AIGC detection at the manuscript warehousing stage. Most academic institutions stipulate that the proportion of AIGC-generated content in dissertations shall not exceed 30%, while there is still no unified standard for AIGC content in journal manuscripts.

Current AIGC detection methods have certain technical limitations, so the relevant requirements should be appropriately relaxed for reference purposes. It is recommended to follow the standards for dissertations: the proportion of AIGC-generated content in modules with high originality requirements, such as the results and conclusions sections of scientific papers, shall be ≤ 30%[20-22], while that in other modules may be ≤ 40%.

3）Verification of title, authors and their personal information, affiliation and submission IP address

The Chinese and English titles of the manuscript can be searched by consulting databases to verify whether identical or similar titles exist. If identical or similar titles are found, the content of the two papers shall be further reviewed. If the content is different, the author may be advised to revise the title.

Sometimes, there are cases where the titles seem different but share the same inherent logical structure in expression—for example, manuscripts with titles formatted as "A Targets B to Promote/Inhibit the Proliferation of C Cancer Cells". For such cases, it is necessary to further verify whether the research objects, technical routes, result indicators and charts are identical.

For authors and their information, the editorial office can rely on the manuscript submission and editing system to review the naming regularity of authors' registered email addresses, usernames, and passwords; it can also verify the accuracy of their phone numbers and ID card numbers[18, 23-25].

When suspecting that a manuscript is ghostwritten or submitted by an intermediary, contacting the author via phone is a highly effective method of verification. If the author's phone remains unanswered for a long time, or the author is unable to independently respond to content related to the manuscript, the possibility that the manuscript is ghostwritten or submitted by an intermediary shall be considered[23].

A credibility risk assessment shall be conducted on all contributing authors to check whether they have records of manuscript retraction, disciplinary penalties for academic misconduct, or academic questioning. If such records exist, the manuscript shall be subject to intensified review throughout all stages of the handling process.

In terms of reviewing the authors' affiliations and manuscript submission IP addresses, it is necessary to verify whether the research backgrounds of the authors and their affiliations are consistent with the research content of the manuscript, and whether they match the research level of the manuscript. If there is a mismatch, the manuscript shall be flagged as suspicious and further judged in conjunction with other review checklists. For manuscripts with multiple authors affiliated to institutions of different types and with significant disciplinary differences, the authorship shall be suspected of being conferred gratuitously[24-25]. The submission IP address provided by the manuscript submission and editing system shall be compared with the IP address of the author's affiliation. If the two are inconsistent, the corresponding author may be contacted to request an explanation. The rationality of the explanation shall be evaluated before considering the formal warehousing of the manuscript. If a surge of similar manuscripts from the same IP

segment is received in a short period after accepting a manuscript with inconsistent submission IP and affiliation IP, such manuscripts shall be suspected of being submitted by academic paper intermediaries[25].

4）Verification of abstract, author profile, and funded projects

Focus on verifying whether the key data in the abstract is consistent with that in the main text. Vigilance shall be raised if any data inconsistency is detected at any review stage. The authors may be contacted to submit the original data for verification, and the rationality of such inconsistencies shall be determined on a case-by-case basis.

Check whether the author profiles are written in accordance with the journal's requirements. If it is found that the author profiles in different manuscripts fail to comply with the journal's specifications, or that the author profiles in batch-submitted manuscripts share an identical logical structure, the manuscripts shall be flagged as suspicious and further evaluated in conjunction with other review checklists.

Regarding the verification of funding projects, authors shall be required to upload the cover page, project title, as well as the pages specifying the applicant and participants of the funding project. Focus shall be placed on verifying the timeliness of the funding, the relevance of the funding content to the manuscript, and the correlation between the funding applicants/participants and the manuscript authors[26-27]. This is to prevent unauthorized affiliation, irrelevant affiliation, premature affiliation, overdue affiliation, and even the fabrication of funding projects.

5）Verification of Materials and Methods

This section constitutes a critical step in screening for "sausage papers" and duplicate publications. It involves searching databases for specific reagents and equipment mentioned in the submitted manuscripts to identify any previously published similar papers, then comparing the similarities and differences between the published works and the submissions to make an informed judgment. Reviewing the special instruments, equipment and specimens described in the Materials and Methods section serves as a key basis for editors to determine whether a manuscript involves malicious plagiarism of published papers or intentional multiple submissions of the same work.

6）Verification of Ethical Approval Documents and Informed Consent Forms

For manuscripts involving human or animal research, authors shall be required to provide the ethical review approval and information on the informed consent obtained from patients/volunteers at the time of submission. If a manuscript reports a human prospective study, authors must, in accordance with ICMJE requirements, complete clinical trial registration on or before the enrollment of the first patient, in addition to the aforementioned approval documents[28].

It is necessary to verify whether the content of the ethical review approval and patients' informed consent forms is relevant to the manuscript, whether the approval/signature dates are reasonable, whether the official seals are legible, and whether there are any traces of forgery on the seals[29]. If the issuing institution of the ethical review approval is neither the author's affiliated institution nor the institution where the data/patients were sourced, the manuscript shall be deemed suspicious, and a comprehensive judgment shall be made in conjunction with other checklists for review.

7）Verification of materials and methods

Consistent verification of the consistency of data throughout the entire manuscript handling process shall be prioritized. In particular, before manuscript warehousing, after author revisions,

and during the proofreading phase, it is advisable to cross-check the key data presented in both the Chinese and English abstracts.

The academic publication guidelines formulated by organizations such as the ICMJE clearly stipulate requirements for data ethics. Practices including data fabrication, falsification, and selective reporting are all regarded as serious academic misconduct[13].

If duplicated table titles or data within tables are detected during the text similarity check, it is necessary to further verify the research objects, research methods, and data/patient sources of the two papers in question. When data-related irregularities are identified, the authors shall be notified to provide the original data (including raw experimental records, patient admission records, questionnaire samples, and experimental codes) for verification.

For manuscripts containing statistical results, the editorial office shall conduct a preliminary statistical screening before the formal warehousing of the manuscripts. If the standard deviation of the data is unreasonably high or low, it shall be suspected that incorrect statistical methods have been adopted or data has been falsified[30]. In such cases, authors shall be required to provide a reasonable explanation before being granted an opportunity for revision; after revision, the authors must submit the original data for verification by the editorial office.

8）Verification of results in figures

Image review in Chinese scientific and technological papers is a key and difficult point in editorial work. When conducting image review, editors should first check whether discontinuous noise, color bands, or cloning spots appear in the image background; then verify whether knife-edge-like sharp edges or feathered halos exist at the edge splicing positions; finally examine the proportions, specifically whether the magnification ratios of different areas within the same image are consistent[31-33].

When reviewing sample photographs, focus shall be placed on checking whether the samples in the manuscript have been reused, partially altered, or photographed from different angles and presented as new results. Common methods of plagiarizing others' images include downloading, cropping from published papers, rephotographing, or scanning. Such images usually have low resolution, and authors may be required to provide the original image files for verification.

When reviewing microscope images, focus shall be placed on checking whether partial images (e.g., cell structures) have been duplicated, whether background noise has been removed, whether the fluorescence signal intensity is consistent with the biological characteristics of the sample, and whether the scale bar is matched with the actual magnification.

Examine the EXIF information of the microscope images, with emphasis on verifying whether there are additional data bytes in the XMP Data and Photoshop Resources sections; this method can be used to identify whether the images have been tampered with[32].

Systematic comparison and analysis can be conducted by searching for relevant images through keyword retrieval in professional academic image databases[33].

At present, there are image similarity check and comparison tools such as ImageTwin, Proofig AI, CrossCheck and Wanfang Wencha, as well as technical methods like Photoshop Droplets that provide image reverse restoration to assist in judging the authenticity of images. However, there is no relatively authoritative software available. To this day, the review still relies on editors' visual inspection, making it difficult to identify and resolve all potential issues in the images during the manuscript review stage.

When reviewing electrophoresis images, focus shall be placed on checking whether the bands

have blurred edges or jaggedness, whether the brightness or contrast has been adjusted, whether any bands have been deleted or added, and whether the molecular weight markers have been forged.

9）Verification of references

References shall be reviewed during the preliminary editorial assessment stage. Editors must verify item by item whether the serial numbers, authors, publication years, and page numbers of the citations in the main text are fully consistent with those listed in the reference section, so as to ensure the consistency of citations. They shall also verify the authenticity of each reference and the accuracy of its metadata in databases via information such as DOIs. Meanwhile, editors need to review whether the content cited in the manuscript is relevant to the corresponding references. The use of fabricated references, indirect citations, or the omission of key original references shall be avoided.

3.2 Key review points in secondary review

For the secondary review of authors and their affiliations, attention shall be paid to whether the number of authors has been increased or decreased in the revised manuscripts submitted in previous rounds, and whether the corresponding author designation has been added. During all stages of manuscript processing, it is necessary to verify whether there have been any additions or deletions of authors or affiliations, or any changes to the order of authors or affiliations.

For the secondary review of funding projects, focus shall be placed on whether the authors have added new funding support, whether the content of the newly added funding is relevant to the manuscript, and whether the funding was obtained after the submission date of the manuscript.

For the secondary review of the results section, the key points are to verify whether the revised text, tables, and figures contain any fabricated content, and whether they have statistical flaws.

3.3 Key review points in proofreading

The editorial office shall conduct a secondary text similarity check and AIGC detection on the full text of the manuscript after the revisions have been completed and before the proofreading stage. On the one hand, this can identify whether the additional content added by the authors during the revision process involves plagiarism or was generated by AI. On the other hand, it can detect whether the authors have submitted manuscripts with identical or similar research content to other journals.

3.4 Recommended list of other review items

Review of Submission Behaviors. Alert should be raised to submissions made by third - party intermediaries if any of the following circumstances is identified: a manuscript is simultaneously submitted to multiple editorial offices within one day, as detected in the "Manuscript Tracking" section of the similarity - checking platform; the editorial and submission system indicates that multiple manuscripts are intensively submitted from the same IP address or even the same account in a single day; the payment accounts for manuscripts from different provinces and institutions are identical; or the payment - receiving accounts for manuscript remuneration are the same[34-35].

4. Conclusion

Establishing a systematic set of special review guidelines for academic misconduct is the core pathway for Chinese scientific and technological journals to fulfill their role as academic gatekeepers. On the basis of assistance from technical tools, editors should strengthen their professional judgment and integrate these review guidelines into the entire manuscript handling

process.

It is recommended that editorial offices further formulate and promote self-check checklists for authors, specifying the key points of academic misconduct to be avoided prior to submission as well as corresponding normative requirements, so as to guide authors to conduct self-review and self-discipline at the source.

In the future, intelligent review systems can be developed by integrating artificial intelligence technologies (such as natural language processing and image recognition), to achieve accurate early warning and efficient interception of academic misconduct. This will drive Chinese scientific and technological journals toward higher quality and more stringent standards, and provide solid support for purifying the academic ecosystem.

Attention should be paid to the potential difficulties in the implementation of the checklist system, such as authors' varying levels of understanding and insufficient attention to the norms, the universality challenges posed by the particularities of interdisciplinary research, and the effective connection between the editorial review process and the author self-check link.

Safeguarding the cornerstone of academic integrity depends not only on the advancement of technology and improvement of systems, but more importantly on effectively stimulating and uniting the intrinsic sense of responsibility and self-disciplinary ecosystem among the three main stakeholders: authors, editors and reviewers.

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