From Detection to Decision

Kritika Khulbe

Sr. Publishing Integrity Manager

Publishing Integrity Office, ACS Publications

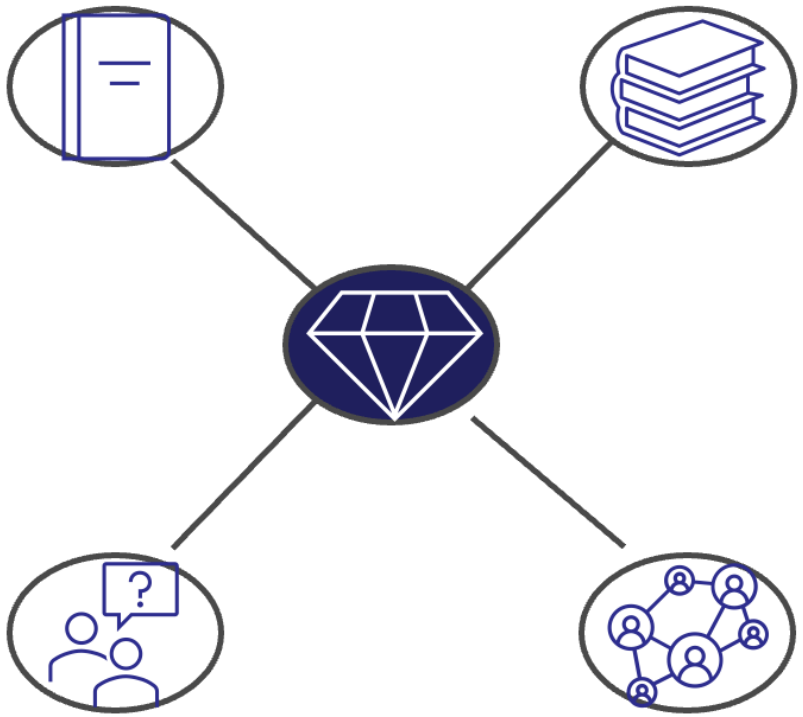
October 23, 2026

Publishing Integrity Office

Advancing trusted science by ensuring the reliability, credibility, and integrity of published research

Policy
Evaluate, maintain, and develop portfolio-wide policies, guidelines, and standards

Education
Provide training and educational resources, including best practice recommendations



Consultation
Advise and support editorial staff and journal editors on reported issues and questions

Partnership & Collaboration
Drive positive change and stay up to date with community developments and standards

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Promoting Ethical Behavior and Data Integrity

Implementing and revising policies and processes to encourage ethical behavior

Screening & Tools

- Plagiarism checks
- Image integrity assessment
- AI-generated content detection
- Risk identification

Ethics Case Handling

- Investigate ethical concerns
- Manage misconduct cases
- Apply COPE guidelines
- Recommend corrective actions

Data Integrity

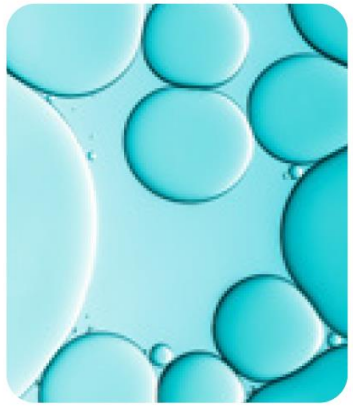
- Data Checks and integrity assessment
- Data Help Desk
- Data Standards
- Data Policy

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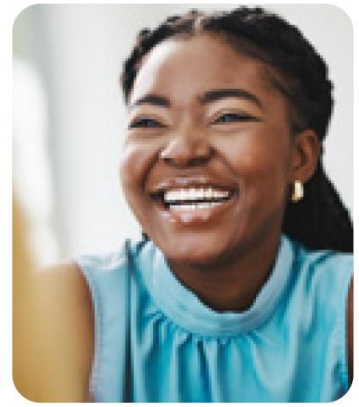
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Data Checks: Process Overview













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How it is Accomplished

Compliance

Resolve non-compliant authors

Data Quality

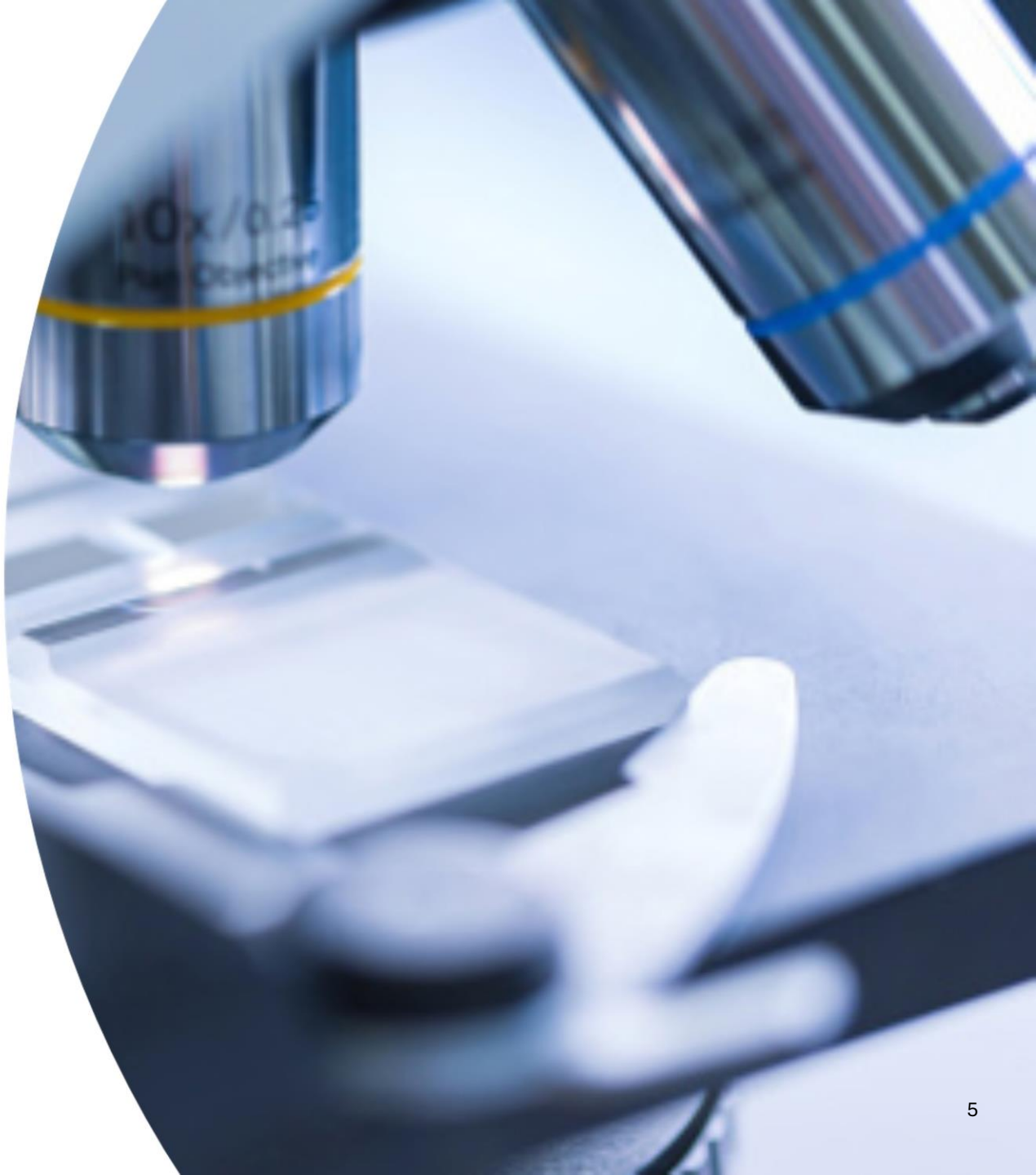
Clarify manuscript data checks

Revision Guidance

Support NMR, HRMS etc., synthetic methods

Process Improvement

Reduce duplicate data-check workload



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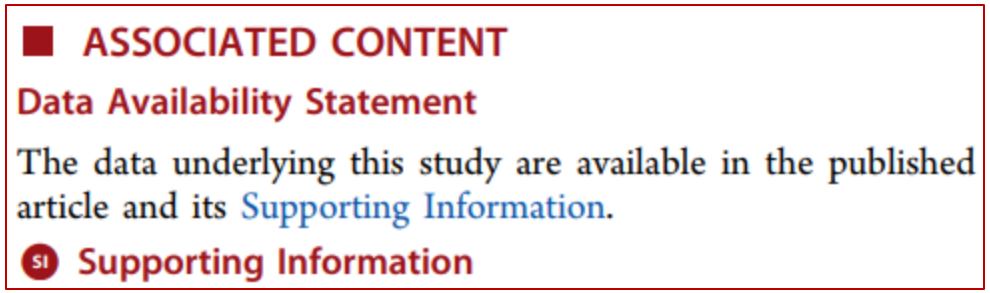
Open-Data Sharing: Data Availability Statement

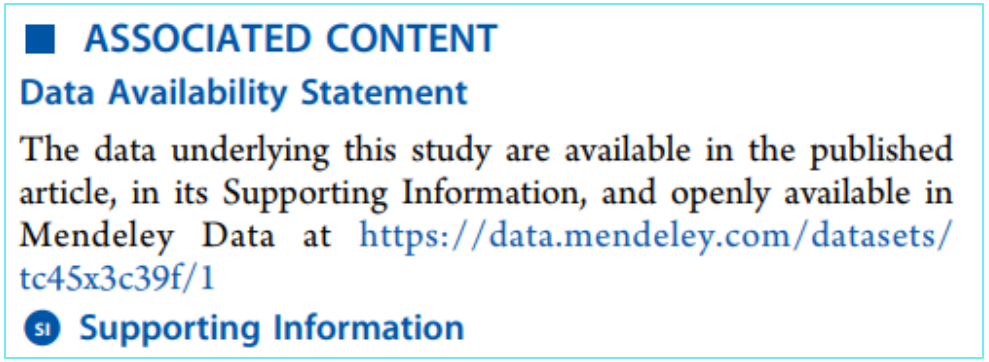
Data Availability Statements

- Makes research more trustworthy
- Enhances scientific reputation
- Greater opportunity for impact to be recognized
- Promotes reproducibility and transparency in research

Repository requirements:

- Persistent unique identifier available (e.g., DOI or Accession #)
- Complies with journal-specific data deposition requirements and author guidelines
- Publicly accessible without requiring personal credentials (e.g., email address, account registration, or user ID)





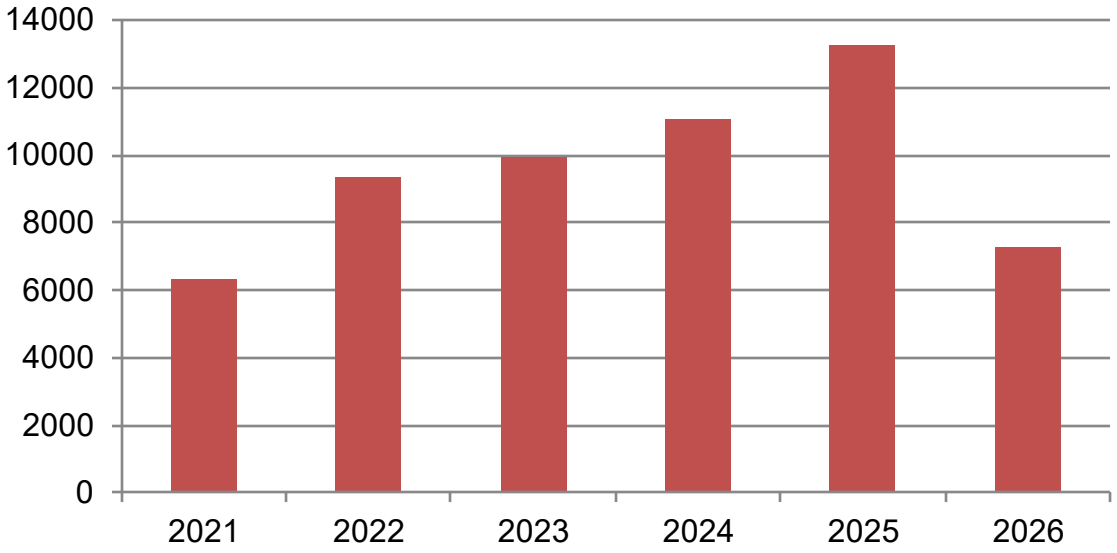
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Data Checks in Publishing

Data integrity assessments increased substantially between 2021-2025

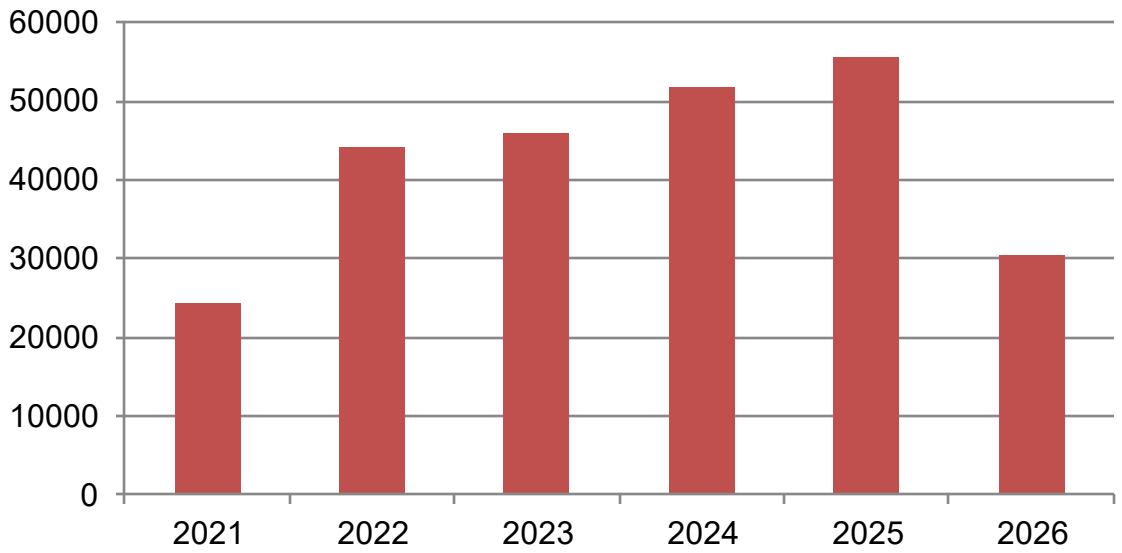
Data Check Workflow applied for 5 journals

Total: 57,177 | Peak Year: 2025 (13,270)



CIF Check Workflow spread across 11 journals

Total: 252,591 | Peak Year: 2025 (55,599)



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Limitations on Data Checks

COVERAGE

Assessment currently focused on selected journals

OPERATIONAL

Limited data curator capacity to support growing submission volumes

KEY CONSTRAINTS

ASSESSMENT

Not every submission represents a data issue

EXPECTATIONS

Preference for high-level summaries with rapid turnaround

Scalability Requirement: Balancing scientific rigor, operational capability and portfolio-wide scalability to design a platform for expanding data integrity assessment

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Data Help Desk

Expert support for scientific data integrity assessments and publication-related data inquiries

Data Integrity Review

- Image manipulation & duplication assessment
- Crystallographic data review
- NMR spectra analysis
- Data duplication detection
- Data-related investigations
- Guidance on data issue resolution

Specialized Data Support

- CIF checks
- Data submission support
- Data re-use evaluation
- NMR editing
- Image editing
- General data quality checks

What We Provide

✓ Analyst findings and observations

✓ Assessment of integrity concerns

✓ Recommendations and next steps

✓ PPT summary deck with supporting evidence

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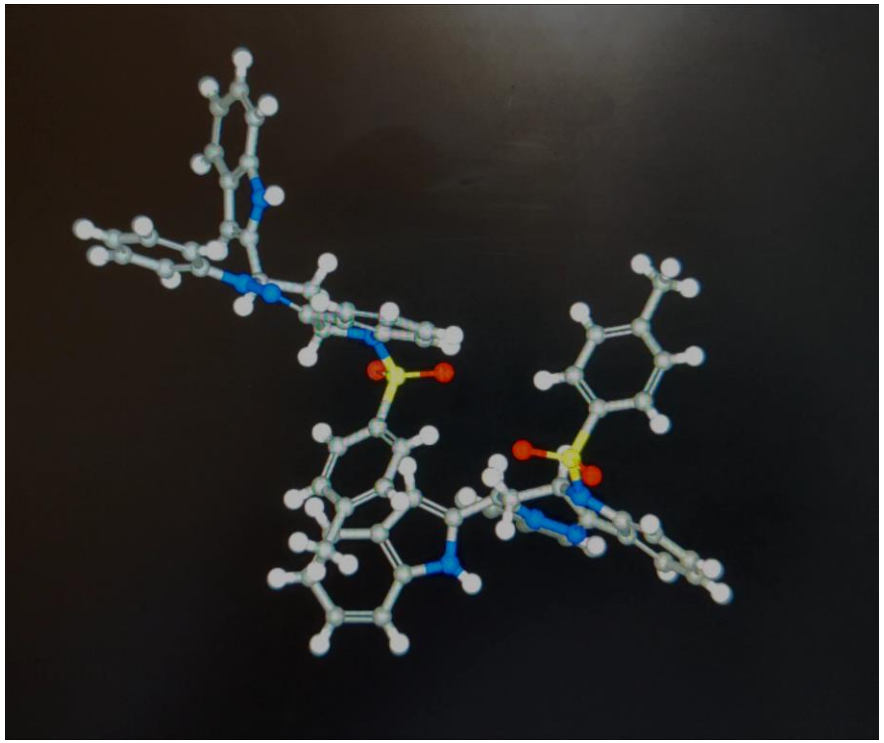
CIF/CCDC Check Workflow

- CCDC codes are verified for consistency during the peer review process – codes required at submission
- Crystal data is reviewed and verified prior to acceptance
- Selected journals in the screening workflow

Submission – Custom Question

CIF Data Collection	
req Does your manuscript contain any new, unpublished crystal structures intended for publication?	
✓	Yes
	No
req If yes, provide all CCDC deposition numbers in the box below, separating each number by a single space. For all other CIFs not accommodated by the CCDC, authors are required to upload the data on the **File Upload** step of submission. See Requirements for Depositing X-Ray Crystallographic Data [PDF].	

Publication – Interact with Structures



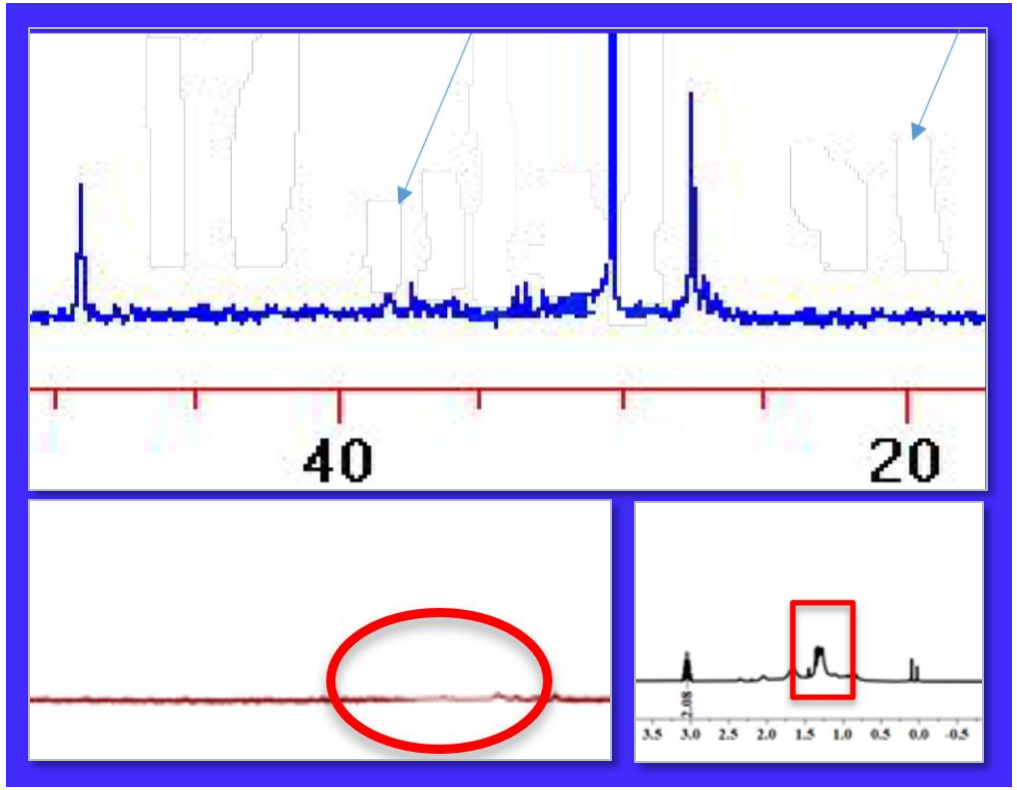
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Identifying Potential NMR Spectrum Manipulation

Common integrity concerns identified during editorial and peer-review assessment

Assessment of data integrity

- Baseline and peak distortion detection
- Spectral noise consistency assessment
- Identification of cropping and peak masking
- Verification of peak authenticity
- Review of raw NMR FID data



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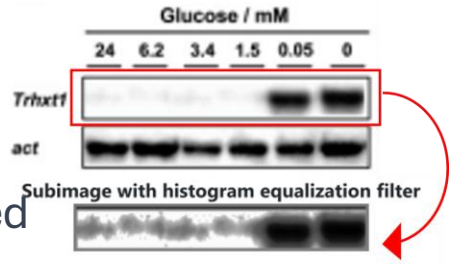
Image Similarity Assessment and Editorial Risk Evaluation

LOW RISK: Verification

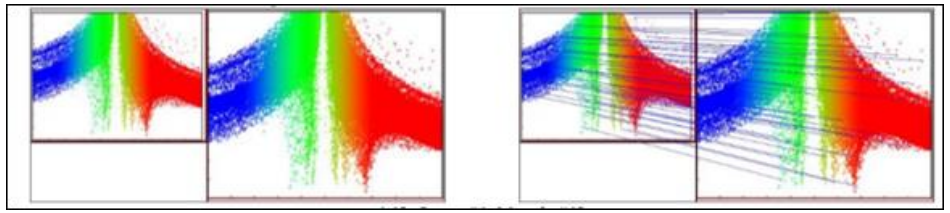
- Same image at different magnifications
- Minor similarity detected
- Confirm with raw data

MODERATE RISK: Investigation

- Potential duplication
- Requires author explanation
- Additional source files needed



MODERATE RISK: Investigation



HIGH RISK: Editorial Review

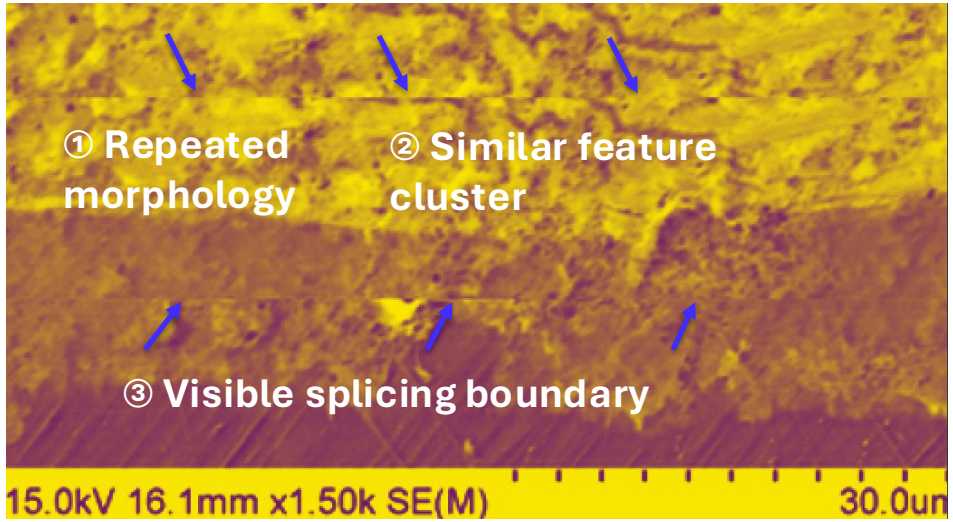
- Image manipulation concerns
- Unexplained duplication
- Editorial decision required

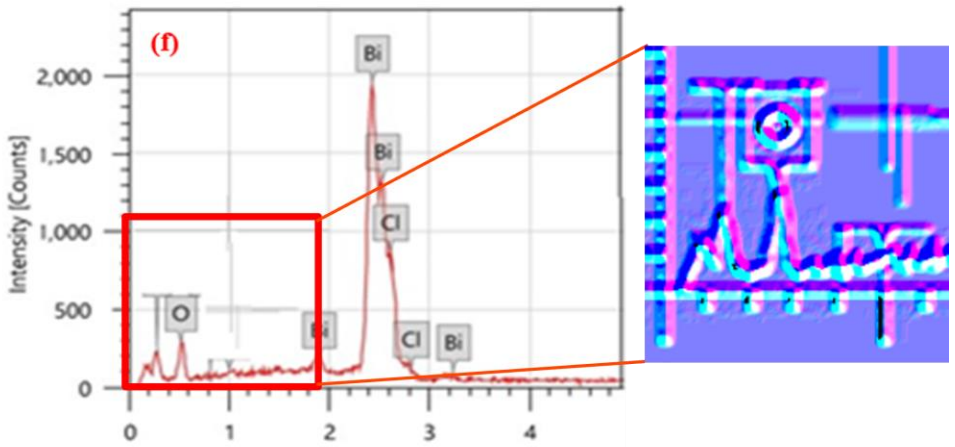
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High-Risk Image Integrity Cases

HIGH RISK

Representative Cases Requiring Editorial Assessment





RISK INDICATORS

- Similarity pattern
- Background signal
- Visible Splicing
- Manipulation indicator

REQUIRED ACTION

- Request raw data
- Seek clarification
- Verify source data
- Editorial assessment

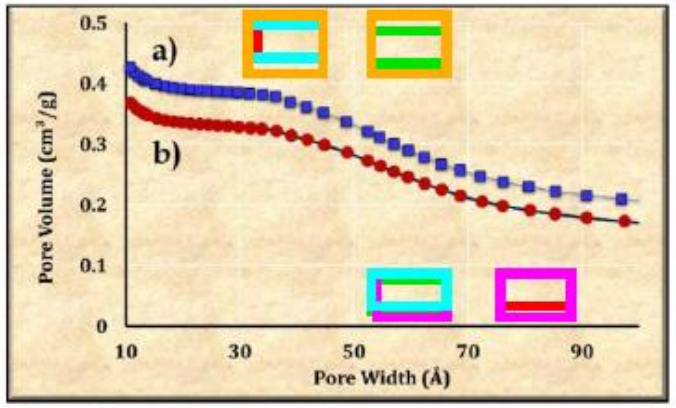
High-risk image concerns typically require raw-data verification and frequently escalate to editorial review.

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False Positives: When Detection Tools Need Expert Review

Detection → Expert Review → False Positive

1. Image Duplication Alert



Detection Tool Flag

Similar highlighted regions triggered a duplication alert.

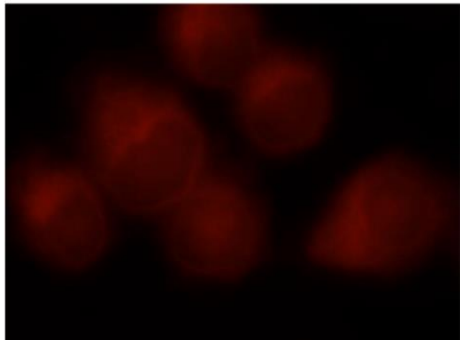
Expert Review

Repeated patterns arise from data representation.

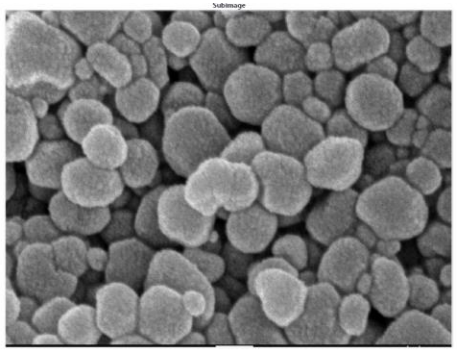
AI Flag → Human Review → False Positive

2. AI Similarity Detection

Fluorescence Image



SEM Image



Detection Tool Flag

Automated tools may flag expected imaging outputs

Expert Review

Source data analysis confirmed real images.

Automated tools identifies potential risks; expert evaluation distinguishes true.

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Summary

Detection

- AI-assisted screening
- Image analysis tools
- Manual checking
- Potential concern identification

Assessment

- Expert evaluation
- Context review
- Check data standards and policies

Decision

- Editorial review
- Consistent framework
- Ethical consideration
- Final decision

Impact

- Protect research integrity
- Improve decision quality
- Strengthen trust

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