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# Academic Integrity

**Tomáš Razím**

IOCB PhD Skills Day: Essential researcher competencies

**November 20, 2024**



# Agenda

- Academic/research integrity and ethics
- Guidelines for academic and research integrity
- Examples of good research practice
- Dealing with specific ethical issues

# **Academic integrity and ethics**

# Academic integrity and ethics

## Ethics

“Choice making around ‘**right**’ and ‘**wrong**’ values and behavior”

Definition taken from: Groves Williams, L. (2016). *Review of Ethics Principles and Guidance in Evaluation and Research* [online]. Available at: <https://www.gov.uk/government/publications/review-of-ethics-principles-and-guidance-in-dfid-evaluation-and-research> [Accessed 2024-02-10].

## Integrity

“Compliance with **ethical** and **professional principles, standards** and consistent system of **values**, that serves as **guidance** for making **decisions** and taking actions”

**Academic integrity** “... in education, research and scholarship”

**Research integrity** “... by individuals or institutions in research” (good research practice)

Definitions taken from: Tauginienė, L. et al. (2018). *Glossary for Academic Integrity: Report (revised version)* [online]. European Network for Academic Integrity. Available at: [https://www.academicintegrity.eu/wp/wp-content/uploads/2023/02/EN-Glossary\\_revised\\_final\\_24.02.23.pdf](https://www.academicintegrity.eu/wp/wp-content/uploads/2023/02/EN-Glossary_revised_final_24.02.23.pdf) [Accessed 2024-07-03].

# Why is academic and research integrity important?

- Ensures **honest, responsible, and fair** behavior
- Prevents causing harm to research participants, society, and the environment
- Builds and preserves **trustworthiness**
- Maximizes **reliability, quality, and credibility** of research/scholarship
- Protects **reputation** and **career** over the long-term

Consequences of research integrity violations (for researchers, colleagues, university/institution, society)

## More reading on academic and research integrity:

[STEMskiller - Academic ethics and integrity: Concepts and definitions](#)

[On Being a Scientist: A guide to responsible conduct in research](#)

[European Network for Academic Integrity \(ENAI\)](#)

[Embassy of Good Science](#)

The background features several light gray, wavy, organic shapes that resemble liquid or smoke. On the far left and right edges, there are vertical bars: the left one is black and gray, and the right one is red and white.

# **Guidelines for academic and research integrity**

# Guidelines for academic and research integrity

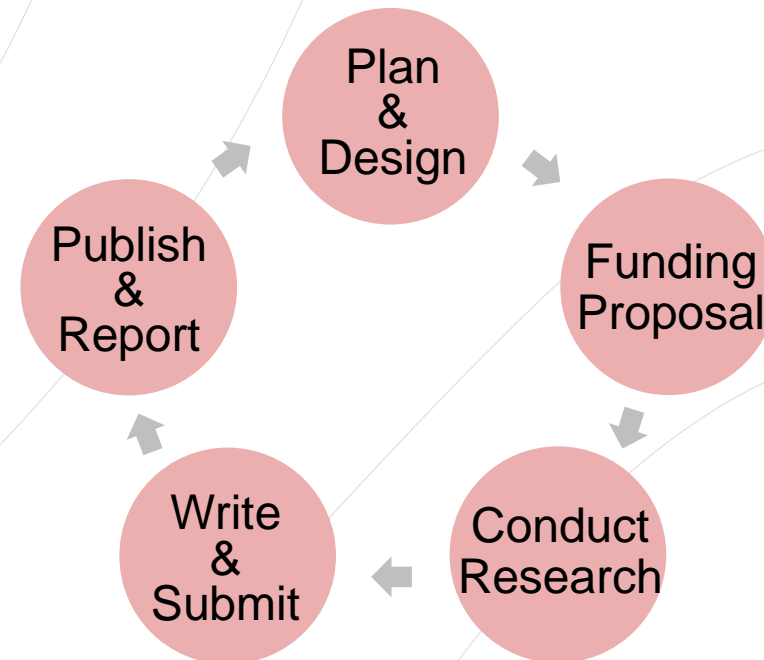
## Codes/guidelines

- Documents defining ethical and professional principles, values, and standards
- National, institutional, and disciplinary variations
- Students/researchers should be aware of and comply with specific codes and guidelines related to their own context (i.e., studies/research).

### Embassy of Good Science

- **International concepts**
- **National concepts**
- **Universities**
- **Research institutes**
- **Journals and publishers**
- **Funding agencies**

### Research process



# International concepts of research integrity

## The European Code of Conduct for Research Integrity (ALLEA, 2023)

“Serves as a framework for self-regulation across all scientific and scholarly disciplines”

### 1. Principles

- Reliability
- Honesty
- Respect
- Accountability

### 2. Good Research Practices

- Research environment
- Training, supervision, mentoring
- Research procedures
- Safeguards
- Data practices and management
- Collaborative working
- Publication, dissemination, authorship
- Reviewing and assessment

### 3. Violations of Research Integrity = research misconduct

- Fabrication
- Falsification
- Plagiarism





# International concepts of research integrity

## World Conferences on Research Integrity:

2007: Lisbon

2010: Singapore  
Singapore Statement on Research Integrity

2013: Montreal  
Montreal Statement on Research Integrity in Cross-Boundary Research Collaborations

2015: Rio de Janeiro

2017: Amsterdam  
Amsterdam Agenda

2019: Hong Kong  
Hong Kong Principles for Assessing Researchers

2022: Cape Town  
Cape Town Statement on Fostering Research Integrity through Fairness and Equity

2024: Athens

## Singapore Statement on Research Integrity

**Preamble.** The value and benefits of research are vitally dependent on the integrity of research. While there can be and are national and disciplinary differences in the way research is organized and conducted, there are also principles and professional responsibilities that are fundamental to the integrity of research wherever it is undertaken.

### PRINCIPLES

*Honesty* in all aspects of research  
*Accountability* in the conduct of research  
*Professional courtesy and fairness* in working with others  
*Good stewardship* of research on behalf of others

### RESPONSIBILITIES

- 1. Integrity:** Researchers should take responsibility for the trustworthiness of their research.
- 2. Adherence to Regulations:** Researchers should be aware of and adhere to regulations and policies related to research.
- 3. Research Methods:** Researchers should employ appropriate research methods, base conclusions on critical analysis of the evidence and report findings and interpretations fully and objectively.
- 4. Research Records:** Researchers should keep clear, accurate records of all research in ways that will allow verification and replication of their work by others.
- 5. Research Findings:** Researchers should share data and findings openly and promptly, as soon as they have had an opportunity to establish priority and ownership claims.
- 6. Authorship:** Researchers should take responsibility for their contributions to all publications, funding applications, reports and other representations of their research. Lists of authors should include all those and only those who meet applicable authorship criteria.
- 7. Publication Acknowledgement:** Researchers should acknowledge in publications the names and roles of those who made significant contributions to the research, including writers, funders, sponsors, and others, but do not meet authorship criteria.
- 8. Peer Review:** Researchers should provide fair, prompt and rigorous evaluations and respect confidentiality when reviewing others' work.
- 9. Conflict of Interest:** Researchers should disclose financial and other conflicts of interest that could compromise the trustworthiness of their work in research proposals, publications and public communications as well as in all review activities.
- 10. Public Communication:** Researchers should limit professional comments to their recognized expertise when engaged in public discussions about the application and importance of research findings and clearly distinguish professional comments from opinions based on personal views.
- 11. Reporting Irresponsible Research Practices:** Researchers should report to the appropriate authorities any suspected research misconduct, including fabrication, falsification or plagiarism, and other irresponsible research practices that undermine the trustworthiness of research, such as carelessness, improperly listing authors, failing to report conflicting data, or the use of misleading analytical methods.
- 12. Responding to Irresponsible Research Practices:** Research institutions, as well as journals, professional organizations and agencies that have commitments to research, should have procedures for responding to allegations of misconduct and other irresponsible research practices and for protecting those who report such behavior in good faith. When misconduct or other irresponsible research practice is confirmed, appropriate actions should be taken promptly, including correcting the research record.
- 13. Research Environments:** Research institutions should create and sustain environments that encourage integrity through education, clear policies, and reasonable standards for advancement, while fostering work environments that support research integrity.
- 14. Societal Considerations:** Researchers and research institutions should recognize that they have an ethical obligation to weigh societal benefits against risks inherent in their work.

The Singapore Statement on Research Integrity was developed as part of the 2nd World Conference on Research Integrity, 21-24 July 2010, in Singapore, as a global guide to the responsible conduct of research. It is not a regulatory document and does not represent the official policies of the countries and organizations that funded and/or participated in the Conference. For official policies, guidance, and regulations relating to research integrity, appropriate national bodies and organizations should be consulted. Available at: [www.singaporestatement.org](http://www.singaporestatement.org)

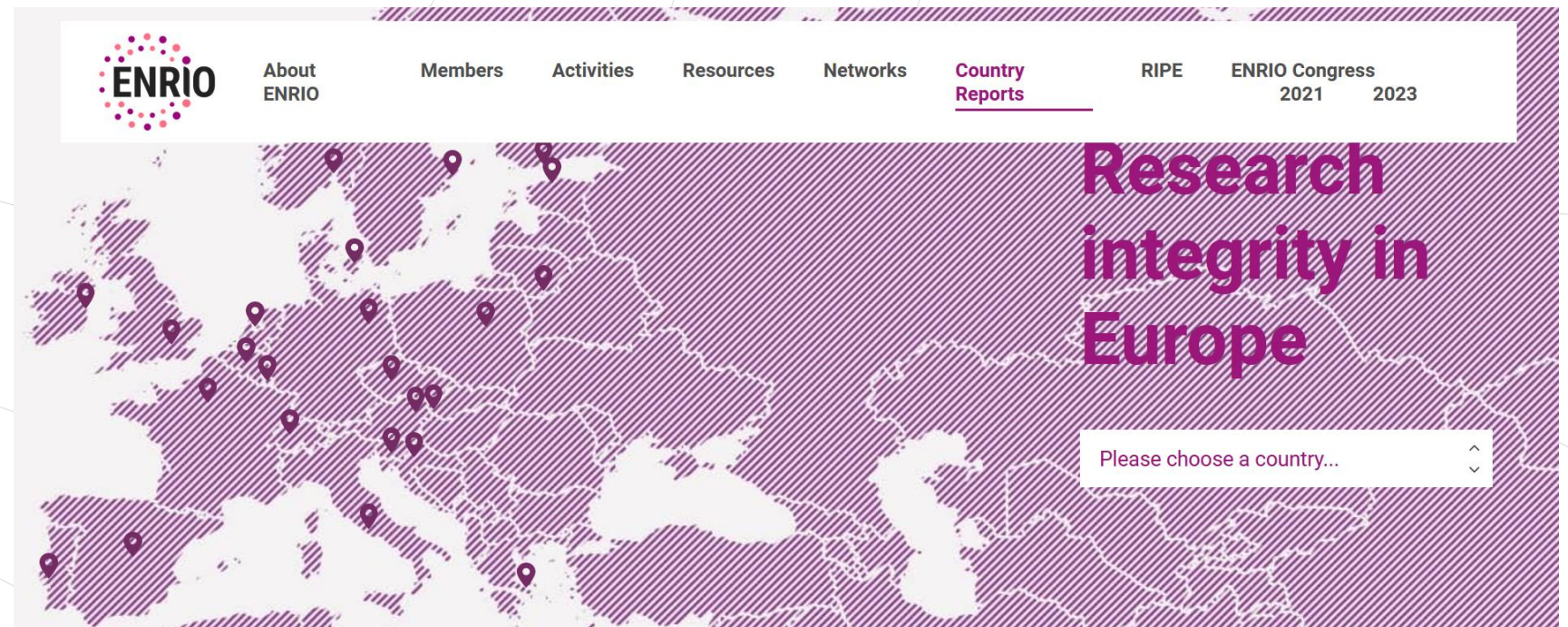
Source: World Conferences on Research Integrity (2010). *Singapore Statement on Research Integrity* [online]. Available at: <https://www.wcrif.org/downloads/main-website/singapore-statements/223-singapore-statement-a4size/file> [Accessed 2024-07-03].

# National concepts of research integrity

## Czech Republic

- Ministry of Education, Youth and Sports: Etický rámec výzkumu (2005), Czech only
- Czech Academy of Sciences: Code of Ethics for Researchers of the CAS

**EU country reports also at:** European Network of Research Integrity Offices (ENRIO)



Source: European Network of Research Integrity Offices (n.d.). Country Reports. *ENRIO* [online]. © 2024 [www.enrio.eu](http://www.enrio.eu). Available at: [www.enrio.eu/country-reports/](http://www.enrio.eu/country-reports/) [Accessed 2024-07-03].

# Universities

## Code of Ethics

### Czech universities

- Charles University: Code of Ethics
- Czech Technical University in Prague: Code of Ethics
- University of Chemistry and Technology, Prague: Code of Ethics and Ethics Committee
- Czech University of Life Sciences Prague: Etický kodex, Code of Ethics (unofficial translation)

### Collaborating universities (internships, exchanges)

- Stanford: Code of Conduct

# Research institutes

## Czech research institutes

- Czech Academy of Sciences: Code of Ethics for Researchers of the CAS
- Institute of Organic Chemistry and Biochemistry: Code of Ethics for Researchers of the IOCB

## Collaborating research institutes (internships, exchanges)

- Max Planck institute: Code of Conduct

## Research fields and disciplines

- World Medical Association: WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects

## Research ethics committee/institutional review board (IRB)

- Charles University: Faculty Committee for Ethics in Research



# Journals and publishers

## **Publishers: Guidelines and policies**

- Elsevier: [Policies and Ethics for Authors](#), [Publishing Ethics](#)
- Springer: [Publishing Ethics for Journals](#), [Editorial Policies](#)
- Wiley: [Guidelines – Publishing Ethics](#)

## **Journals: Instructions for authors/ Guide for authors (or reviewers)**

- [Journal of Hydrology](#)

## **General guidelines**

- [Committee on Publication Ethics \(COPE\): Guidelines](#)

# Funding agencies

**Czech Science Foundation (GAČR):** Code of Conduct (PI, Tender documents, Reviewers)

**European Commission:** Funding & tender opportunities (Ethics review)

**Horizon Europe:** Programme Guide, How to complete your ethics self-assessment

EU Grants: How to complete your ethics self-assessment: V2.0 – 13.07.2021

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# Examples of good research practice

# Examples of good research practice

## Safeguards

- Comply with relevant **codes, regulations, and guidelines**
- Cause **no harm** to society, environment, or cultural values
- Research results should **benefit** society
- Consider **ethical and safety aspects** (e.g., research involving human participants, animals, personal data) and **requirements** (e.g., ethical approval, GDPR, informed consent)

## Research environment, training, supervision, and mentoring

- Openness and correctness in communication
- Respect, equity, diversity, and inclusion
- Supervision, mentoring, and transfer of knowledge skills
- Free exchange of information and opinions
- Expand **skills and knowledge** (e.g., training, courses, conferences)



# Examples of good research practice

## Research procedures and data management

- Accuracy, objectivity, and critical thinking in research; avoid bias
- Proper data management:
  - Clear and complete data **documentation** and description (e.g., lab notebook, metadata)
  - Consistent data **organizing** (e.g., formats, names, versions)
  - **Storage, backup, and preservation** (e.g., security, confidentiality)
  - Appropriate **sharing** of data and results (e.g., access rights, licenses, repositories)
  - Open Science and FAIR principles
  - **NTK materials:** [Introduction to research data management](#) (slides from webinar, 2024)

## Collaborative work

- Define roles, responsibilities, intellectual property rights, authorship, and data use

# Examples of good research practice

## Publishing research results

- Clear and **complete description** of materials and methods (ensure reproducibility, validation)
- Give credit to all contributions (**authorship, acknowledgements**)
- Acknowledge **sources** (e.g., financial, material, facility) and **cite** properly
- Provide appropriate **affiliation(s)**
- Publish in **reputable journals** (avoid predatory journals)
- Multiple submission is unethical
- **Always read and follow the instructions of the target journal/publisher:**
  - Journal policies (e.g., AI tools, data sharing, graphical images)
  - Required statements (e.g., data availability, conflict of interest, author contributions)
  - Ethics declarations (e.g., approval for animal/human experiments)
  - Intellectual property rights (e.g., copyright transfer agreement, licensing (open access))

# Good research practice

## Research integrity (good research practice) concerns the entire research process

(planning, conducting, reporting, and so on)

### Interactive tools for academic/research integrity:

- Data management plan tools: [RDMkit](#)
- Checklists: Checklist for [Master](#) and [Doctoral](#) Students and [Data Ethics Checklist \(Bridge\)](#)  
[Recommended Checklist for Researchers \(UKRIO\)](#)
- Applications and games: [Integrity Matters Mobile Application](#), [Integrity Games](#), [Dilemma Game](#)
- Interactive movie: [The Lab: Avoiding Research Misconduct](#)
- Self-Evaluation Tools: [European Network for Academic Integrity](#)

### Research process



# Specific issues

# Falsification and fabrication

“**Falsification** is manipulating research materials, equipment, images, or processes, or changing, omitting, or suppressing data or results without justification.”

“**Fabrication** is making up data or results and recording them as if they were real.”

Definition taken from: ALLEA (2023). *Op. cit.*, p. 10.

Video: [Data Fabrication and Falsification](#)

## How to avoid

- Be meticulous when working with data, do not tamper with results
- Keep the (raw) data, have a documented research plan, keep a research log
- Double-check your work (by yourself and your colleagues): [On discovering mistakes](#)

# Falsification and fabrication

- **Image manipulation**

- Inappropriate enhancement of the image: e.g. removing/moving/adding/obscuring specific features, duplication, rotation, plagiarism
- Small adjustments might be acceptable (but always check the journal policies)
- ORI: Tips for Presenting Scientific Images with Integrity  
Guidelines for Best Practices in Image Processing  
Examining image techniques: Forensic Droplets

- The Misleading graph

## Cases

- Image discrepancies at Dana-Farber Cancer Institute
- The Rector Who Never Was
- Image manipulation in Alzheimer research at University of Minnesota and City University of New York (with a meta-ethical twist)

# Plagiarism

“**Plagiarism** is using other people’s work and ideas without giving proper credit to the original source.”

Definition taken from: ALLEA (2023). *Op. cit.*, p.10.

- Several types of plagiarism
- **Anti-plagiarism (text duplication) software:** it is easily discovered (universities check their theses, journals their articles); e.g., Turnitin, Odevzdej.cz, iThenticate
- Both **ethical** and **legal issue** (intellectual dishonesty, copyright violation)

## Cases

- What is (too much) plagiarism? The resignation of Claudine Gay

# Plagiarism

- **Unintentional plagiarism** (e.g., cryptomnesia): still plagiarism, punishment might be less severe, but your reputation is damaged nonetheless

## How to avoid:

- Be meticulous when writing and working with citations (more)
  - Before submitting a manuscript, run it through text duplication/anti-plagiarism software
  - Try not to rush things at the last minute
- 
- **Self-plagiarism**: presenting your previously published findings as original (the case of Zygmunt Bauman)

## How to avoid:

- Cite yourself! (but don't overdo it)



# Authorship

*“Authorship should be limited to those who have made a significant contribution to the concept, design, execution or interpretation of the research study. All those who have made significant contributions should be offered the opportunity to be listed as authors. Other individuals who have contributed to the study should be acknowledged, but not identified as authors.”*

Definition taken from: American Physical Society (1991). *APS Guidelines for Professional Conduct*. American Physical Society Sites [online]. Available at: [https://www.aps.org/policy/statements/02\\_2.cfm](https://www.aps.org/policy/statements/02_2.cfm) [Accessed 2021-10-20].


- Ghost/gift authorship is considered an ethical issue as well
- Publishers: **author contribution statement** (CRedit Contributor Roles Taxonomy)
- How to handle authorship disputes: a guide for new researchers (COPE)
- Acknowledgement section (minor contributions)
- Different fields, different customs: sequence of authors (significance, alphabetical, last author)

# Other ethical issues in science

- **Predatory practices** (journals, conferences): check for typical characteristics; see WoS and Scopus “white lists” or list of excluded journals; consult your supervisor/librarian/colleague
- Pseudoscience, junk science, paper mills, vanity press, hijacked, or other **controversial journals** (Hindawi and MDPI special issues controversy)
- **Peer review**: open/blind, fake, conflict of interest (reviewer, author)
- **Evaluation** of research: validity of metrics, funding (2017+)
- **Publishing industry**: publishers and subscription policies (open access, open science)
- **AI and technology in science**: can be used to fabricate text and images but also to detect fraud and errors

# Articles: Rejection and retraction

- Rejecting papers before publication (review, anti-plagiarism software)
- **Retraction** of already published papers:
  - Reasons: misconduct or honest mistakes
  - Different journals might use different ways to mark retracted articles, (not) provide reasons
  - COPE: Retraction guidelines for scholarly publishing



The screenshot shows a PubMed article page for a retracted article. The article title is "Cardiac stem cells in patients with ischaemic cardiomyopathy (SCIPIO): initial results of a randomised phase 1 trial." The article is marked as "RETRACTED ARTICLE" with a link to "See: Retraction Notice". The article is from the journal "Lancet", published on 26 Nov 2011. The authors listed are Bolli R, Chugh AR, D'Amario D, Loughran JH, Stoddard MF, Ikram S, Beache GM, Wagner SG, Leri A, Hosoda T, Sanada F, Elmore JB, Goichberg P, Cappetta D, Solankhi NK, Fahsah I, Rokosh DG, Slaughter MS, Kajstura J, Anversa P. The article is available in full text on The Lancet and PMC. The abstract states: "BACKGROUND: c-kit-positive, lineage-negative cardiac stem cells (CSCs) improve post-infarction left ventricular (LV) dysfunction when administered to animals. We undertook a phase 1 trial (Stem Cell Infusion in Patients with Ischemic cardiomyopathy [SCIPIO]) of autologous CSCs for the treatment of heart failure resulting from ischaemic heart disease. METHODS: In stage A of the SCIPIO trial, patients with post-infarction LV dysfunction (ejection fraction [EF] ≤40%) before coronary artery bypass grafting were consecutively enrolled in the treatment and control groups. In stage B, patients were randomly assigned to the treatment or control group in a 2:3 ratio by use of a computer-generated block randomisation scheme. 1 million autologous CSCs were administered by intracoronary infusion at a mean of 113 days (SE 4) after surgery; controls were not given any treatment. Although the study was open label, the echocardiographic analyses were masked to group assignment. The primary endpoint was short-term safety of CSCs and the secondary endpoint was efficacy. A per-protocol analysis was used. This study is registered with ClinicalTrials.gov, number NCT00474461. FINDINGS: This study is still in progress. 16 patients were assigned to the treatment group and seven to the control group; no CSC-related

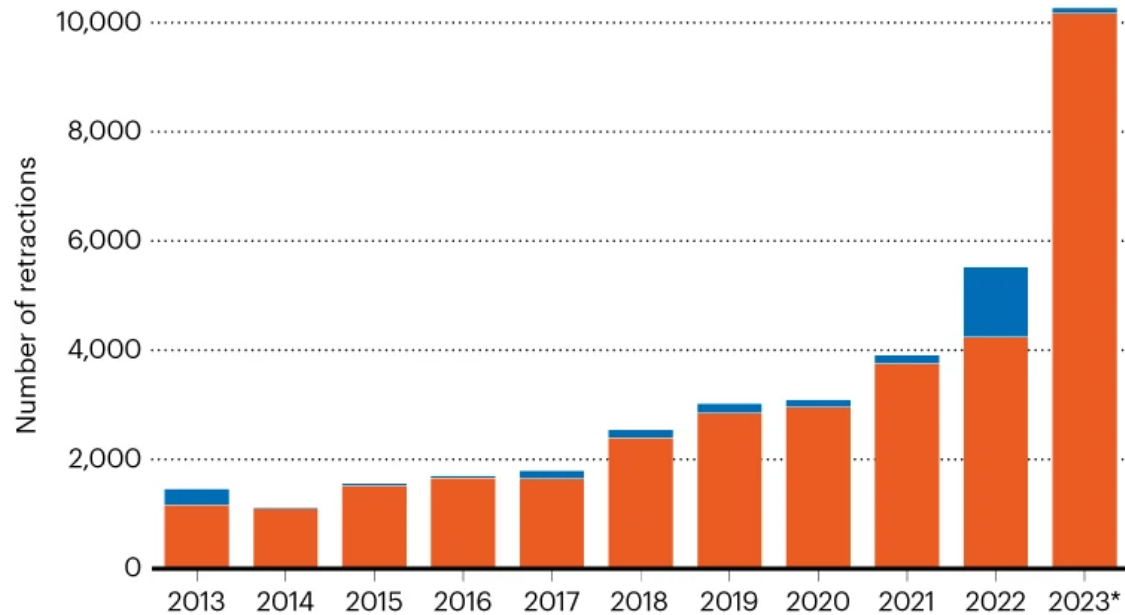
Source: National Library of Medicine (2011). *PubMed* [online]. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/22088800> [Accessed 2024-02-09].

# Retractions on the rise

## A BUMPER YEAR FOR RETRACTIONS

Retraction notices in 2023 have passed 10,000, largely because of more than 8,000 retractions by Hindawi.

Journal articles Conference papers



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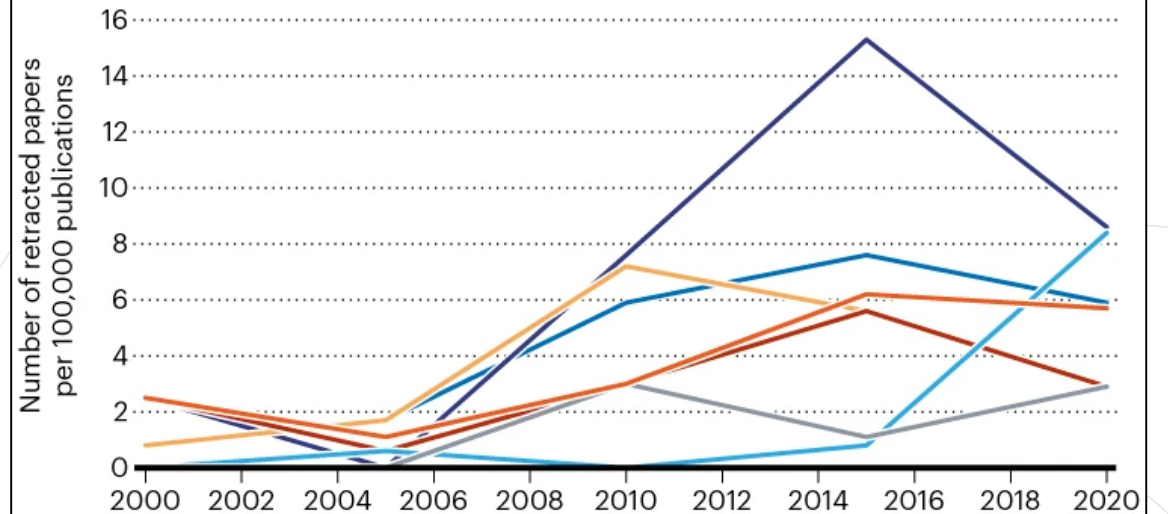
\*As of 8 December 2023

Image taken from: Van Noorden, Richard (2023). More than 10,000 research papers were retracted in 2023 – a new record. *Nature* [online]. DOI: <https://doi.org/10.1038/d41586-023-03974-8> [Accessed 2024-02-09].

## MISCONDUCT RETRACTIONS

The number of biomedical research papers retracted because of reasons related to misconduct has risen since 2000.

Authorship and/or affiliation problems Duplication  
Ethical and legal problems Falsification/fabrication  
Plagiarism Unreliable data Unreliable results



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Image taken from: Else, Holly (2024). Biomedical paper retractions have quadrupled in 20 years — why?. *Nature* [online]. DOI: <https://doi.org/10.1038/d41586-024-01609-0> [Accessed 2024-09-13].

# What do you think?

## Why does scientific misconduct occur?

### Does it get punished adequately?

# Sources: Stay updated

- Retraction Watch: database
- Committee on Publication Ethics (COPE): Flowcharts
- The Office of Research Integrity
- PubPeer: post-publication peer-review forum
- Wikipedia: List of scientific misconduct incidents
- Věda a výzkum: Akademická Integrita

## Useful links:

- STEMskiller: skills set map for early career researchers
- ENAI & FAIT: support and consultation when you suspect academic misconduct
- ČAD: The Czech Association of Doctoral Researchers

# Learning outcomes

- Ethics are an integral part of research process
- The most common breaches of academic integrity are fabrication, falsification, and plagiarism
- There might not be a straightforward solution for every situation; norms and requirements differ in time and space – stay updated
- Be aware of your institutional and journal/funding requirements
- To avoid problems:
  - Be meticulous when working with data and resources
  - Aim for replicability of research (dealing with data, reporting research)
  - Stick to the scientific method
  - Respect your colleagues, society, and the environment



# Get Assistance

## 1) Schedule a consultation

- Please don't be shy; our team includes doctoral students who know the issues you face
- LaTeX support, Bibliometric services

## 2) Attend other webinars

## 3) Explore by yourself

- STEMskiller: comprehensive skills set map for early career researchers
- Tutorials: NTK instructional materials and recordings and links to more information
- Subject guides





# Contacts

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**Thank you**

**Questions?**