NanoBio4Can: Key Points in Research Ethics and Integrity

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Table of Contents

NanoBio4Can: Key Points in Research Ethics and Integrity 1

Abstract 3

1 Introduction 4

2 Core Principles 5

3 Good Research Practices 5

3.1 Research Environment 5
3.2 Training, Supervision, and Mentoring 5
3.3 Research Procedures 5
3.4 Safeguards 6
3.5 Data Practices and Management 6
3.6 Collaborative Working 6
3.7 Publication, Dissemination, and Authorship 6
3.8 Reviewing and Assessment 6

4 Emerging Principles in Research Integrity 7

4.1 Diversity, Equity, and Inclusion: 7
4.2 Open Science: 7
4.3 Research Assessment and Responsible Metrics: 7
4.4 Transparency in Peer Review and Publication: 7
4.5 Artificial Intelligence and Digital Tools: 7

5 Violations of Research Integrity 8

5.1 Misconduct includes: 8
5.2 Other Unacceptable Practices: 8

6 Reporting & Investigation 8

7 Glossary of Terms 9

8 Abbreviations 11

9 Research Ethics and Integrity Compliance Checklist 12

10 Declaration of Generative AI and AI-assisted Technologies in the Writing Process 13

11 Version History 13

12 Contact 13

13 References 14

Abstract

This document summarizes the core principles, good research practices, and emerging standards of research integrity for the NanoBio4Can project, in accordance with the European Code of Conduct for Research Integrity (2023 Revised Edition). It outlines essential responsibilities for fellows and supervisors, including reliability, honesty, respect, and accountability, as well as best practices for research conduct, data management, and publication. The guidelines address both traditional and emerging challenges, including diversity and inclusion, open science, responsible metrics, transparency, and the responsible use of artificial intelligence. The document also provides clear definitions of research misconduct and unacceptable practices, a compliance checklist, and instructions for reporting concerns, supporting a culture of integrity and international best practices within the project

Keywords: Research Integrity; Good Research Practices; European Code of Conduct; Open Science; NanoBio4Can

1 Introduction

The European Code of Conduct for Research Integrity (Revised Edition 2023), published by ALLEA (All European Academies), is an official reference document for research integrity in Europe intended to guide researchers, institutions, and stakeholders involved in research. The document provides a detailed framework of principles, good practices, and responsibilities that ensure research is carried out in an honest, reliable, respectful, and accountable manner. It applies to all scientific and scholarly fields and is relevant across academia, industry, and other research settings. The European "Code of Conduct for Research Integrity" is a standard reference in European Union research projects (including Horizon Europe), often forming a binding part of grant agreements and consortium policies. It aims to:

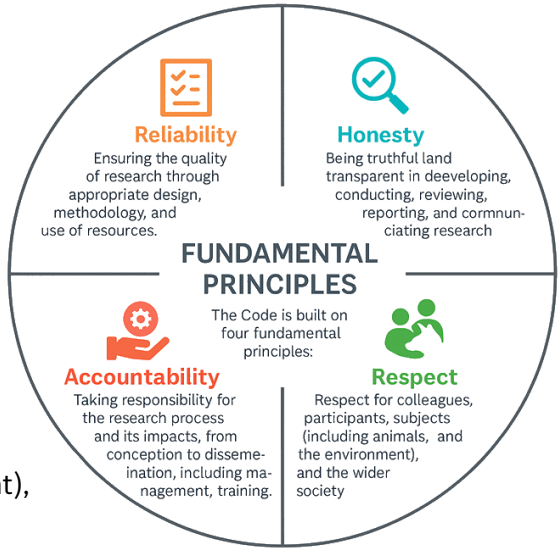
- Maximize the quality and reliability of research
- Prevent research misconduct and foster a culture of integrity
- Protect participants and society

"NanoBio4Can: Key Points in Research Ethics and Integrity" document summarises the main principles and good practices of research integrity from the original, most up-to-date European Code of Conduct for Research Integrity (2023) document, tailored for all members and partners of the NanoBio4Can project. All fellows, supervisors, co-supervisors, and collaborators must uphold these standards.

Please refer to the full document for details. This is a "project-specific summary" based on the official European Code of Conduct for Research Integrity (2023) and is meant to complement, not replace, the full code.

2 Core Principles

The Code is built on **four fundamental** principles:



- **Reliability:** Ensuring the quality of research through appropriate design, methodology, analysis, and use of resources.
- **Honesty:** Being truthful and transparent in developing, conducting, reviewing, reporting, and communicating research.
- **Respect:** Respect for colleagues, participants, subjects (including animals and the environment), and the wider society.
- **Accountability:** Taking responsibility for the research process and its impacts, from conception to dissemination, including management, training, and societal consequences.

3 Good Research Practices

The Code outlines **best practices** in the following areas:

3.1 Research Environment

- Institutions must foster a culture of integrity, promote equity, diversity, and inclusion, support researchers, and provide adequate resources.
- Leadership is expected to have clear policies and protect whistleblowers.

3.2 Training, Supervision, and Mentoring

- Provide rigorous training in research design, methods, analysis, ethics, and integrity.
- Senior researchers must mentor and guide junior researchers and set a good example.

3.3 Research Procedures

- Base research on the current state-of-the-art, design and document studies carefully, consider diversity among participants, use funds conscientiously, and share results openly.

3.4 Safeguards

- Comply with legal, ethical, and safety regulations.
- Assess and mitigate risks and harms associated with research.

3.5 Data Practices and Management

- Preserving data, code, protocols, etc., for a stated period.
- Data should be as open as possible and as closed as necessary (FAIR principles).
- Inform participants how data will be used and how intellectual property (IP) will be managed equitably.

3.6 Collaborative Working

- Agree in advance on project goals, integrity standards, legal requirements, IP protection, and publication practices.

3.7 Publication, Dissemination, and Authorship

- Authorship should reflect contributions and be agreed upon by all authors.
- Include an author contribution statement.
- Acknowledge non-authors who contributed.
- Disclose conflicts of interest and sources of support.
- Publish both positive and negative results.
- Promptly issue corrections or retractions if needed.

3.8 Reviewing and Assessment

- Conduct peer review and assessment transparently and fairly.
- Declare and manage conflicts of interest.

- Maintain confidentiality and respect authors' rights.

4 Emerging Principles in Research Integrity

4.1 Diversity, Equity, and Inclusion:

NanoBio4Can is committed to fair access, participation, and treatment for all researchers, regardless of background, gender, or circumstance. We actively encourage diverse perspectives and equal opportunities throughout all project activities.

4.2 Open Science:

We promote transparency, reproducibility, and the sharing of methods, data, and results in line with Horizon Europe's Open Science principles, making research outputs accessible to all.

4.3 Research Assessment and Responsible Metrics:

Research outputs and achievements are assessed based on quality, impact, and integrity.

4.4 Transparency in Peer Review and Publication:

We support open and fair peer review processes and encourage full disclosure of methods, results, and potential conflicts of interest in all publications.

4.5 Artificial Intelligence and Digital Tools:

Artificial intelligence (AI) or digital tools in research must be transparent. Any significant role played by such tools should be clearly disclosed, and researchers remain responsible for the integrity and validity of their work.

5 Violations of Research Integrity

5.1 Misconduct includes:

- Fabrication: Making up data or results.
- Falsification: Manipulating data or methods.
- Plagiarism: Using others' work without credit.

5.2 Other Unacceptable Practices:

- Allowing sponsors to bias research.
- Withholding or selectively citing data.
- Misusing authorship or self-plagiarizing.
- Using predatory journals or paper mills.
- Hiding the use of AI in writing without disclosure.

6 Reporting & Investigation

Principles for handling allegations of misconduct include:

- Presumption of innocence.
- Fair, thorough, and prompt investigation.
- Confidentiality and conflict of interest management.
- Protecting whistleblowers.
- Proportional sanctions for violations.
- Restorative action when researchers are proven clear.

7 Glossary of Terms

Term	Description
Accountability	Taking responsibility for all aspects of research, from design to publication and its broader impacts.
ALLEA	All European Academies – an organization that developed the European Code of Conduct for Research Integrity.
Authorship	Recognition given to individuals who have made significant intellectual contributions to a research output.
Confidentiality	Protecting sensitive information and identities (such as whistleblowers or participants) during research/investigations.
Conflict of Interest	A situation where personal, financial, or other interests could improperly influence a researcher's objectivity.
Data Management	The process of storing, organizing, protecting, sharing, and preserving research data follows FAIR principles.
Ethics	Moral principles and standards that guide behaviour and decision-making in research.
Fabrication	Making up data, results, or research processes and presenting them as real.
Falsification	Manipulating research materials, equipment, processes, or changing data to misrepresent results.
FAIR Principles	Guidelines ensuring research data are Findable, Accessible, Interoperable, and Reusable.
Good Research Practices	Accepted standards for conducting and reporting research responsibly and transparently.
Misconduct	Serious breaches of research integrity, including fabrication, falsification, plagiarism, or other unethical behaviours.
Peer Review	Evaluation of research by independent experts to ensure quality and credibility before publication.
Plagiarism	Presenting someone else's work, ideas, or data as your own without proper acknowledgment.
Predatory Journal	A publication that exploits the open access model by charging fees without proper editorial and peer review standards.
Principles of Research Integrity	Core values of reliability, honesty, respect, and accountability guide ethical research conduct.
Publication Ethics	Standards and rules for transparent, fair, and responsible publishing, including authorship, peer review, and disclosure.
Research Integrity	Commitment to conducting research honestly, responsibly, and

Term	Description
	according to ethical and professional standards.
Respect	Valuing the rights, dignity, and contributions of all research participants, colleagues, and society.
Whistleblower	A person who reports suspected violations of research integrity, such as fraud, plagiarism, or unethical behaviour.
Whistleblower Protection	Policies and practices that safeguard individuals who report misconduct from retaliation, discrimination, or harm.

8 Abbreviations

Abbreviation	Full Term
AI	Artificial Intelligence
ALLEA	All European Academies
COFUND	Co-Funding of Regional, National, and International Programmes
EU	European Union
FAIR	Findable, Accessible, Interoperable, Reusable
IP	Intellectual Property
MSCA	Marie Skłodowska-Curie Actions
RRI	Responsible Research and Innovation
TUBITAK	Scientific and Technological Research Council of Türkiye

9 Research Ethics and Integrity Compliance Checklist

☐ I have read and understood the key points in the Responsible Research, Ethics and Integrity document.

☐ My research adheres to the core principles: Reliability, Honesty, Respect, and Accountability.

☐ I have obtained all necessary institutional and/or national ethics approvals before beginning research (including human/animal research, and data protection if required).

☐ Research methods, data collection, and analysis are transparent, well-documented, and reproducible.

☐ I have assessed risks and implemented safeguards to protect participants, animals, the environment, and data security.

☐ All research data, code, and protocols are preserved and managed according to FAIR (Findable, Accessible, Interoperable, Reusable) principles and project requirements.

☐ Authorship reflects intellectual contributions and was agreed upon in advance by all contributors.

☐ Any use of AI or digital tools is transparently disclosed and appropriately documented.

☐ Conflicts of interest and sources of funding/support are disclosed in all publications and presentations.

☐ Peer review and assessment processes are conducted fairly, confidentially, and without bias or conflict of interest.

☐ All results—positive or negative—are reported honestly, and corrections/retractions are made promptly if errors are discovered.

☐ I am familiar with the procedures for reporting suspected violations of research integrity and know that whistleblowers are protected.

☐ I have consulted the latest version of the European Code of Conduct for Research Integrity (ALLEA, 2023) and, where appropriate, national/institutional rules.

10 Declaration of Generative AI and AI-assisted Technologies in the Writing Process

In the preparation of this document, the authors utilized Perplexity AI, a licensed ChatGPT Premium service, and Grammarly Premium to assist with information extraction, content review, and language editing. These tools were employed to enhance spelling, grammar, punctuation, clarity, and overall readability and to support the accurate extraction and summarization of information from the original source materials. Following the use of these technologies, all content was thoroughly reviewed and edited by the authors, who accept full responsibility for the accuracy and integrity of the final version.

11 Version History

Version	Date	Authors	Changes
1.0	26.05.2025	Project Management Team	Initial public release on the website
2.0	24.07.2025	Project Management Team	Metadata added for Zenodo compliance

12 Contact

If you have any questions, please email the project coordination team.

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13 References

https://allea.org/code-of-conduct/