

## RESEARCH INTEGRITY

### Summary

Research integrity can be understood as a summary of responsibilities for the research community on one hand, and as a reassurance of society's trust in the outcomes of research on the other. Research integrity is a key strategic dimension of the Horizon 2020 Programme "Science with and for Society" and is part of the Responsible Research and Innovation concept. This brief aims to provide a concise definition, explanation and context, along with useful (online) resources on research integrity.

### 1. What is research integrity

There are different terms for this area of ethics in research. In this document we are using the term research integrity, as it is already established in the terminology of competent European authorities. Other terms are used in Europe and indeed around the world, terms such as "integrity on scientific research", "responsible conduct of research", "code of ethics for science", "code of practice for research" and "good scientific practice".

***Research integrity is generally understood to mean the performance of research according to the highest standards of professionalism and rigour, in an ethically robust manner.***

The behaviours espoused by ethics and research integrity should ensure the accuracy and truth of the research recorded in publications and elsewhere<sup>1</sup>. Behaving responsibly and keeping the integrity in research implies that researchers report their work honestly, accurately, efficiently and objectively. It also requires them to use honest and verifiable methods in proposing, performing and evaluating research, to report accurate results with respect to rules, to follow commonly accepted professional norms and not allow personal bias to influence scientific findings. Indeed, the credibility of science relies on the quality and reproducibility of results<sup>2</sup>.

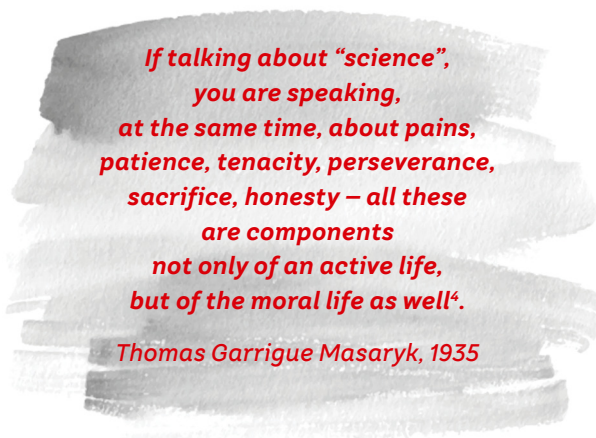
<sup>1</sup> [Briefing paper on Research Integrity: What it means, Why it is important and How we might protect it. Science Europe, December 2015.](#)

<sup>2</sup> Prof. Pere Puigdomenech, EGE



## 2. Why do we need research integrity?

Education, research and innovation are basic pillars of contemporary advanced society. Due to immense opportunities in innovation and increasing technological progress, huge expectations arise – expectations that many needs and ambitions of European society can be fulfilled. We are surrounded by advanced positive, but also disruptive technological and societal changes initiated by research. We are dependent on the reliability of the results of scientific work. The outcome and interpretation of research can be verified by the scientific community, but cannot be verified by the public – for whom the new knowledge is intended. Therefore, citizens need to have confidence in researchers. So the first expectation of scientists is that they are reliable. If science is to remain trustworthy, researchers must lead a positive research culture. They have to follow basic moral principles and must internalise integrity and honesty<sup>3</sup>. The very heart of trust in science lies in the trustworthiness of its researchers.



## 3. Principles of research integrity

The principles that are considered to constitute research integrity vary in different statements and national policies and also across disciplines. Honesty and reliability appear in nearly every statement. All European Academies (ALLEA) issued the *European Code of Conduct for Research Integrity*. The ALLEA Code formulates 4 main principles: honesty, reliability, respect and accountability while, for example, the United States *ORI Introduction to the Responsible Conduct of Research* involves honesty, accuracy, efficiency and objectivity.

<sup>3</sup> [Code of Ethics for Researchers of the Czech Academy of Sciences](#)

<sup>4</sup> Czechoslovak President Masaryk’s view of knowledge and science from the book “Talks with T. G. Masaryk” by Karel Capek

The World Conference on Research Integrity 2010 in Singapore<sup>5</sup> defined core principles and responsibilities in research as follows:

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

Among other accepted principles there is objectivity, impartiality and independence, open communication, duty of care, fairness and responsibility for future generations of researchers. The norms for integrity on scientific research vary according to different national cultures, and have specifics and regulations arising from them.

There is a need for increased guidance on how organisations may address research integrity and misconduct<sup>6</sup>. Research institutions are required to comply with commonly accepted professional codes and norms, and have mechanisms for handling allegations of research misconduct.

Education on good scientific practice is already considered as an unambiguous part of the scientific career path. However, in most European countries it is still in the process of being established. Researchers and students at various stages of their career should receive instruction concerning: conflict of interest, responsible authorship, data management and sharing, as well as policies regarding the use of human and animal subjects.

## 4. Development and international context of research integrity

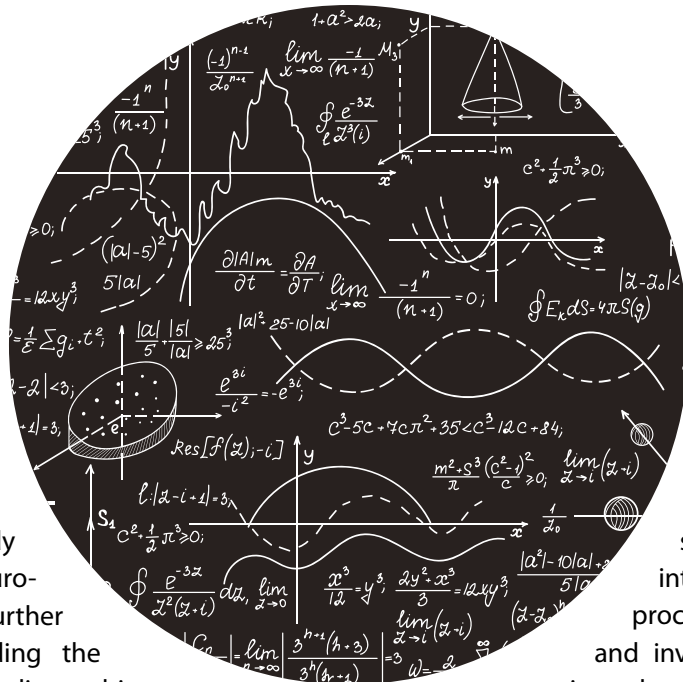
In the Framework Programme Horizon 2020 research integrity is mainly addressed under the concept of Responsible Research and Innovation (RRI). This concept is gathering momentum and is considered an indispensable part of project planning.

The pioneers of research integrity in Europe were the Scandinavian countries in the early 1990’s, while in the USA the Office of Research Integrity (ORI) was established in 1989.

At the European level, the first body which posted recommendations on raising awareness and training on RI was the Science Europe Working Group on Research

<sup>5</sup> [World Conferences on Research Integrity Foundation \(WCRI\)](#)

<sup>6</sup> [PRINTEGER Statement on Research Integrity](#)



Integrity. The European Group on Ethics in Science and New Technologies (EGE), as an independent advisory body of the President of the European Commission, is a further important player providing the Commission with high quality and independent advice on Research Integrity and Research Ethics issues since 1991.

ALLEA, the federation of All European Academies, published (together with the European Science Foundation) the *European Code of Conduct for Research Integrity* in 2011, and revised it in 2017. This document aims to emphasize the responsibility linked to research and to serve the research community as a framework for self-regulation. It describes professional, legal and ethical responsibilities. The basic responsibilities of the research community are: to formulate the principles of research, to define the criteria for proper research behaviour, to maximise the quality and robustness of research, and to respond adequately to threats to, or violations of, research integrity.

The informal European Network of Research Integrity Offices (ENRIO) was founded in 2007 and brings together experts who deal with questions about research integrity. ENRIO, with approximately 30 member organisations from over 20 European countries, aims to foster international cooperation. It raises awareness of research integrity, promotes trainings in good scientific practices, shares experiences in investigating allegations of research misconduct and supports member organisations in establishing national RI structures.

The European Network of Research Ethics and Research Integrity (ENERI) was launched as an EU-funded

project in 2016. Within a period of three years, ENERI aims to exchange expertise in the field of research ethics and research integrity and to harmonise processes within ethics review and investigation procedures for misconduct in research.

**Research integrity is at the very heart of the research enterprise and is intrinsic to the value of research to society, and society's trust in the outcomes of this enterprise.**

*Science Europe Briefing Paper on Research Integrity, 2015*

## 5. Typical misbehaviour in research

Research misconduct is harmful for knowledge. It could mislead other researchers, it may threaten individuals or society – e.g. if it becomes a basis for unsafe drugs or unwise legislation – and, by subverting the public's trust, it could lead to a disregard for research.

Research misconduct is usually defined as *fabrication, falsification and plagiarism*. However, different countries and institutions add other unacceptable research practices to their definition of research misconduct. The core research misconduct definition follows, as well as other current examples of typical misbehaviour in research:

## Research misconduct

<b>Fabrication</b>	Making up results and recording them as if they were real.
<b>Falsification</b>	Manipulating research results, equipment or processes, changing data.
<b>Plagiarism</b>	Using other people’s work and ideas without giving proper credit.

## Other unacceptable and questionable research practices

<b>Failure to keep records</b>	Good scientific record keeping is necessary for data analysis, publication, collaboration, peer review, and other research activities. Record keeping is necessary to support intellectual property claims, it can help to defend against a false allegation of research misconduct and is important in the care of human subjects. The requirement is to maintain proper records that are complete, accurate and understandable to others <sup>7</sup> .
<b>Data mismanagement</b>	As the type of research differs very much between the various scientific fields, general statements regarding the quality of research data management are not possible. Nevertheless, good data management practices that are already established within a number of scientific fields can be introduced in other fields <sup>8</sup> . Responsible research data management includes correctness in data collection, consistency, analysis, processing, ownership, control, storage, protection, retention and sharing.
<b>Ghost or guest authorship</b>	Ghost authorship occurs when a significant contribution is made to a manuscript without that contribution being acknowledged <sup>9</sup> . On the contrary, guest (or gift) authorship occurs when someone who did not contribute in any way to the research and its write-up is included in the author list because they give extra credibility to the article <sup>10</sup> . Both ghost and guest authorship undermine the credibility of scientific reporting.
<b>Ethics dumping</b>	Practices that would be ethically unacceptable in Europe are used in low- and middle-income countries where strong legal frameworks and ethics compliance mechanisms may be lacking. Practices include carrying out research without ethical approval or insurance for harm that may occur during a study, exporting research samples such as blood or DNA without local authorisation, disregarding privacy concerns, exploiting vulnerable populations, or providing an inadequate standard of care in a clinical trial <sup>11</sup> .

Other unacceptable practices may include a *lack of proper acknowledgement, no proper practice in presenting data, and the raising of false expectations.*

7 [Guidelines for Scientific Record Keeping in the Intramural Research Program at the NIH, 2008](#)

8 [Responsible Research Data Management and the Prevention of Scientific Misconduct by Royal Netherlands Academy of Arts and Sciences, 2013](#)

9 [Ghostwriting Positioning Statement by The European Medical Writers Association \(EMWA\), 2012](#)

10 [Publication and Research Ethics and Misconduct, Ethical issues - authorship issues by Springer Nature](#)

11 [Horizon 2020 TRUST Project](#)

## 6. Why is it important to you as an NCP?

National contact points should actively contribute to maintaining the highest possible standards in research integrity. NCP's should ensure that the local research community is satisfactorily informed about the values of integrity and excellence. In order to be able to consult on clients' needs in the area of research integrity, NCP's should include the following among their main tasks:

- » raise awareness of codes of conduct both for researchers and institutions
- » be able to identify mentors and suggest those to young researchers
- » support research organisations in providing clear and transparent research integrity policy
- » understand and identify risks that could lead to misconduct
- » know the tools and structures used to report misconduct

For example, the UK Integrity Office (UKRIO) provides a Recommended checklist for Researchers<sup>12</sup>, a one-page, non-technical checklist of key points of good practice in research and is applicable to all subject areas. Similarly, an international initiative "Think. Check. Attend." uses a simple survey as a guide for researchers. This initiative helps researchers to judge the legitimacy and academic credentials of conferences they have to attend<sup>13</sup>. A parallel initiative "Think. Check. Submit." helps researchers to identify trusted journals<sup>14</sup>.

## 7. Resources & Info

Links to key organisations and publications concerning research integrity:

### Key organisations and support structures:

- » **ALLEA**, All European Academies. *The European Federation of Academies of Sciences and Humanities, founded in 1994, brings together almost 60 member Academies of Sciences and Learned Societies from over 40 countries in Europe and addresses the structural and policy issues facing Europe in science, research and innovation.*

<sup>12</sup> [Checklist for Researchers](#)

<sup>13</sup> [Think. Check. Attend.](#)

<sup>14</sup> [Think. Check. Submit.](#)



- » **COPE**, Committee on Publication Ethics. *A charitable company which promotes integrity in research publication, educates editors and provides guidance for dealing with ethical issues in journal publishing.*
- » **EGE**, The European Group on Ethics in Science and New Technologies. *An independent advisory body of the President of the European Commission.*
- » **ENERI**, European Network of Research Ethics and Research Integrity. *An EU project targeting the exchange of expertise in the field of research ethics and research integrity.*
- » **ENRIO**, European Network of Research Integrity Offices. *An informal network, founded in 2007, bringing together experts who deal with questions about research integrity from more than 30 member organisations.*
- » **ESF**, European Science Foundation. *An internationally-oriented association, established in 1974, with member research-performing and research-funding organisations, academies and learned societies across Europe, aiming to foster cooperation between the various research stakeholders and to support the conduct of scientific research.*
- » **NIH**, National Institutes of Health, U.S. Department of Health and Human Services. *National Institutes of Health act as a medical research agency.*
- » **ORI**, The Office of Research Integrity. *The Office operating within the U.S. Department of Health and Human Services is responsible for research integrity activities, implementation of the responsible conduct of research and prevention of research misconduct.*
- » **PRINTEGER**, Project, Promoting Integrity as an Integral Dimension of Excellence in Research. *An EU project with a mission to enhance research integrity by promoting an improved research culture (2015 – 2018).*

- » **Science Europe**, *An association of European research-funding and research-performing organisations, funded in 2011, promoting their collective interests.*
- » **TRUST**, *An EU project which aims to improve adherence to high ethical standards in scientific research around the world, co-developing with vulnerable populations tools and mechanisms for the improvement of government research structures.*
- » **UKRIO**, *The UK Research Integrity Office. UKRIO is an independent British charity providing advice and support to the public, researchers and organisations to further good practice in academic, scientific and medical research.*
- » **WCRI**, *World Conferences on Research Integrity. The World Conferences on RI seek to promote discussion and to coordinate efforts to improve research integrity on a global scale. Their Statements set out principles and responsibilities in order to encourage the development of unified policies, guidelines and codes of conduct.*

#### Key documents and publications:

- » **ALLEA** *The European Code of Conduct for Research Integrity, 2017. The code serves the European research community as a framework for self-regulation across all scientific and scholarly disciplines. It describes professional, legal and ethical responsibilities, and acknowledges the importance of the institutional settings in which research is organised.*
- » **ALLEA** *Discussion Paper on Loss of Trust in Science and Expertise, 2018. The discussion paper with the title "Loss of Trust? Loss of Trustworthiness? Truth and Expertise Today" discusses the danger of a 'context collapse' in digital communication.*
- » *The concordat to support research integrity by Universities UK, 2012. The British concordat provides a comprehensive national framework for good research conduct and its governance.*
- » **COPE's** *Code of Conduct, 2008, and COPE's Short Guide to Ethical Editing for New Editors, 2016. A tool designed to help editors identify areas of their journal's policies, processes or practices that may require attention or may need to be revised regarding publication ethics.*
- » **Global Code of Conduct** *for Research in Resource-Poor Settings, 2018. Global Code for Research in Resource-Poor Settings counters ethics dumping by building a framework for relationships between partners in lower-income and high-income settings based on fairness, respect, care and honesty.*
- » **International Committee of Medical Journals Editors, 2017. Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals.**
- » **Netherlands Code of Conduct for Research Integrity, 2018. The Netherlands code of conduct reflects international developments in the field of academic integrity that have taken place since its first introduction in 2004, expands and defines five principles of research integrity and 61 standards for good research practices and duties of care for the institutions.**
- » **ORI** *Introduction to the Responsible Conduct of Research, 2007. A publication for the American research community that provides a practical overview of the rules, regulations, and professional practices that define the responsible conduct of research.*
- » **PRINTEGER** *Statement on research integrity, 2018. This statement presents the outcome of comprehensive studies and discussions on research integrity and misconduct conducted by the European PRINTEGER project and should serve as a guide for research-performing organisations.*
- » **Science Europe** *Briefing Paper on Research Integrity: What it means, Why it is important and How we might protect it, 2015. A document about the history of research integrity, overviewing developments in efforts to address issues of research integrity and research misconduct. Among other topics, it raises questions about individual and collective responsibility.*
- » **UKRIO** *Code of Practice for Research. Promoting good practice and preventing misconduct, 2009. The British code contains principles defining the responsibilities and values in the conduct of research by both researchers and research organisations, standards for good practice in research that researchers and research organisations should comply with, and a worthy summary of key good practices in research - the "Recommended Checklist for Researchers".*