Promoting Research Integrity 
in the European Research Area

I) Introduction: Research Integrity as key to research excellence and societal relevance

Values are considered as the foundation of the Union. Its credibility to the outside world relies on its capacity to actively defend and promote the respect of these values explicitly listed in the Treaty. They are essentially based on the protection of the fundamental rights and frame the responsible and ethical conduct of research, a critical factor in achieving excellence and socially relevant impact.

The link between high quality research and economic and societal advancement has been accepted across the globe. Research is associated with vast improvements in our living standards, health and wellbeing, technological improvements and important advancements in human knowledge. During the last decade, there has been very significant and increasing public investment in European research across all spheres. This investment has happened within the wider policy objective of ensuring that Europe can compete effectively with its global neighbors, creating high-value, high-skilled employment, based on research-driven innovation and the successful application of research-generated knowledge.

The achievements of research are built up over time on a stock of accumulated knowledge worldwide. The value of this ‘research record’ is based on the assumption that the knowledge presented is true, complete and unbiased by ideological, economic or political influences. Therefore, research integrity is at the core of science and scholarship. It is a basis for researchers to trust in each other as well as in the research record. Equally important, it is the basis of society’s trust in the research system.

Research integrity is not only a way to protect and be in concord with society but should also be seen as a prerequisite for achieving excellence in research and innovation. As such, research integrity should be seen as an indispensable element to effectively pursue the EU "Jobs, Growth and Investment" priority. Several examples in different disciplines have shown how inappropriate behaviour can have substantial negative and damaging impact.

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1 This Presidency discussion paper has been developed in close cooperation with Dr. Maura Hiney, Health Research Board Ireland and Chairperson of the Science Europe Working Group on Research Integrity; and sections of this paper are extracted (with full permission) from a larger review of research integrity being prepared as part of the work of the SE Working Group.

2 "A new start for Europe" (http://ec.europa.eu/priorities/docs/pg_en.pdf): "The European Union is a union built on values. And we are credible to the outside world if we demand high standards of ourselves when it comes to fundamental values."

3 "Boosting Jobs, Growth and Investment" (http://ec.europa.eu/priorities/jobs-growth-investment/index_en.htm)
Fundamentally, such misconduct introduces weaknesses in the building on the scientific knowledge stocks which can ultimately lead to serious socio-economic consequences. This is especially the case when the research outcome serves as an input to either innovation or policy making.

In order to optimise the effectiveness of the Union’s research systems and funding efforts, it is necessary to actively promote high levels of integrity. Responsible conduct of public and private research covering the entire research and innovation cycle, from the idea to the product should be stimulated. This should rely on an effective framework to promote good research practices and to prevent, discourage, detect and adjudicate research misconduct.

II) Research integrity scope: what are research integrity and research misconduct?

Research integrity relates to the performance of research to the highest ethical and professional standards and rigour. It ensures the accuracy and truth of the research record in publications and elsewhere so that we can make accurate statements about the world in which we live. Research integrity is multi-dimensional and essentially requires that academic and industry researchers conceive their research taking into account its social impact, conduct the research in a responsible manner starting with the research design and the gathering of data. Research integrity is thus at the very heart of the research enterprise and is intrinsic to society’s trust in the outcomes of this enterprise.

Widely accepted global principles, set out in seminal documents such as the Singapore Statement\(^4\), the Montreal Statement \(^5\) and the European Code of Conduct on Research Integrity \(^6\), inform definitions of research integrity. These include honesty, reliability, objectivity, impartiality and independence, open communication, duty of care, fairness and responsibility for future generations of researchers. Integrity implies the use of appropriate techniques and methodologies, including the responsible management of data.

Research misconduct is consequently defined as breaches of research integrity.

Most countries accept that research misconduct includes fabrication, falsification, or plagiarism (FFP) in proposing, performing, or reporting of results, because these violations damage the research record, the very foundation of scholarship and scientific progress.

The OECD\(^7\) defines FFP as:

\(^4\) Singapore Statement on Research Integrity (2011) 2nd World Congress on Research Integrity. [http://www.singaporestatement.org/statement.html](http://www.singaporestatement.org/statement.html)


• Fabrication of data i.e. making up results and recording or reporting them.
• Falsification of data i.e. manipulating research, materials, equipment or processes; changing or omitting data or results such that the research is not accurately represented in the scientific record.
• Plagiarism i.e. the appropriation of another person’s ideas, processes, results, or words without giving due credit, including those obtained through confidential review of others’ research proposals and manuscripts.

In addition to FFP there are many other questionable practices that, while they may not directly and/or immediately damage the research record, still damage the reputation of researchers and the research community. The OECD has categorised such questionable practices to include (but not be limited to):

• Research practice misconduct (e.g. poor research design);
• Data-related misconduct (e.g. withholding data from the scientific community);
• Publication-related misconduct (e.g. claiming undeserved authorship);
• Personal misconduct (e.g. inappropriate personal behavior and harassment);
• Financial and other misconduct (e.g. unreported conflicts of interest, misrepresentation of research credentials; efforts to secure multiple funding for the same research).

Honest errors in research practice or interpretation of data should not be considered misconduct. Therefore, all definitions need to draw a clear distinction between intentional and unintentional acts by researchers.

III) Socio-economic impact of research misconduct

Research misconduct is not a victimless misdeed. It has impacts for researchers and research subjects, institutions, fields of research and public trust.

Although accurate quantitative estimates of the social and economic impact of research integrity are difficult to ascertain, the overall cost and reputational impact can be considerable as evidenced by documented cases. The cost elements are numerous and of various nature raging from the misuse of public funds, the cost of the adjudicating procedures or the compensations for research subjects to the possible resulting stock price decline for private companies.

The impact of research misconduct, when undetected, has considerable effects on policy and funding institutions: it reduces return on investment of public and private funds, distorts the research funding market, changes research and innovation priorities and can be seen as rewarding fraudulent behaviour and tarnishing trust in the research management processes including peer review.

The diverse socio-economic consequences of research misconduct deteriorate the relationship between science and society and mainly impact:
• the health and well-being of citizens and the environment, since the public relies on scientific progress to better the lives of everyone;
• trust in and reputation of research and innovation institutions and more globally the public’s confidence in science; making the public investments in science and research more difficult to justify, although necessary for a long-term growth of the economy, job creation and well-being of the population;
• researchers’ careers and reputations, not only for the guilty researchers but also to colleagues (including whistle-blowers) and the field of study associated with the guilty.

Beyond direct impact on research subjects, the scientific progress and innovation benefits, research misconduct may result in the adoption of erroneous policies based on falsified research results or biased scientific advice. It can also lead to the development of unsafe products put on the market (e.g. medication) further to a non-rigorous scientific validation process.

Conversely, if the research and innovation actors guarantee a generalised and stable high level of integrity, it drastically improves the conditions in which the knowledge necessary to meet the grand societal challenges is produced and used. It notably increases its relevance, robustness, accessibility and dissemination.

IV) Promoting research integrity and preventing misconduct

As evidenced by the Singapore and Montreal Statements, there is broad international agreement on the value and benefit of developing processes and structures that can promote research integrity. These ensure consistency, fairness and transparency in the investigation of misconduct allegations.

The main emphasis across Europe should be on raising the overall level of research integrity rather than on investigating research misconduct.

One of the principal aims of promotional activities is to enhance awareness of research integrity and good research practice, facilitate information exchange amongst research interest groups (junior and senior researchers, funders, university management, publishers and so on) and prevent problems down the line. Good research practice, in this sense, is researchers shared understanding about appropriate behaviors in the context of themselves, their colleagues, the laboratory, department and discipline.

Training in research integrity is widely held to be the best available means of preventing misconduct. The approaches taken to training vary widely across institutions and countries and the effectiveness of different approaches is only now being studied.

Offering research integrity training as part of undergraduate and postgraduate education is a common training approach, although the content, intensity and mode of delivery of training vary widely across institutions. The groups receiving training are primarily doctoral and post-doctoral researchers, and to a lesser extent senior research staff, teaching staff, quality managers and other administrative staff. A number of countries in which there is some national coordination of training (e.g. USA, Canada, Germany and Austria) have initiated
‘train-the-trainer’ courses to introduce consistency into research integrity curricula in their country.
There is a growing consensus on the need to offer specifically tailored education and support for senior researchers and academics, who are very influential in defining acceptable research practice for the next generation of researchers. Good quality mentoring, in combination with training that focuses on norms rather than processes, has the potential to influence behavior in ways that decrease the likelihood of misconduct.

V) Questions to be debated

1) Considering the important role of national and European research programs in particular Horizon 2020, are the current research integrity codes and adjudication mechanisms, developed by national governments and funding agencies, sufficiently transparent and effective in the context of the European Research Area and the internationalization of research? In this context, is there any role the Union can play, e.g. in paying more attention to research integrity in H2020 grant agreements?

2) The nature of the research system itself, especially the organizational structures and the career advancement culture may partly undermine research integrity. What structural changes could be explored to remove incentives for misconduct? Should accountability remain with the individual researchers or be extended to the host institution?

3) Currently there is in Europe room for improving coherence in the approaches to actively promote research integrity and preventing misconduct through training, awareness raising and capacity building. What could be measures and strategies at national and EU levels to address this situation?