

## Why should we care about integrity and ethics in research?

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Research integrity (**RI**) can be defined as a scientist's trait, conduct or behavior that entails the observance and promotion of high moral principles and professional standards in the practice of research. Honesty, fairness, objectivity, reliability, rigour, responsibility, independence, impartiality, transparency, accountability, openness and accessibility stand out among the main fundamental values that underlie **RI**. A commitment to high-quality science requires integrity in the performance of research, this being a primary basis for the advancement of knowledge, as well as for trust in and consolidation of the scientific record. **RI** inspires and ensures best scientific practice and a responsible conduct of research. It must prevail in the relationships among scientists and their colleagues, as well as between scientists and society.

Science pursues the search for truth, and truthfulness must illuminate the performance of research and the reporting of research evidence. Truth actually lies at the core of **RI**. Departure from truth leads to improper behavior in research performance. Research misconduct –the most severe breach of **RI**– is considered to comprise fabrication, falsification, and plagiarism (FFP) in proposing, performing, or reviewing research, or in reporting research results. In addition to FFP, other detrimental or unacceptable research practices may negatively affect the research process in any of its different stages. Although not reaching the misconduct condition, they clearly entail departure from good research practice and are also considered violations of **RI** (1,2). The consequences of unacceptable practices can be wide-ranging. Their occurrence damages the integrity of the research process and the trust among colleagues. It can also cause the society to lose confidence in scientists, the institutions to which they belong and the results of the scientific activity. In addition to entail a waste of resources, the application of research results flawed by unacceptable practices may negatively impact the public, having in some cases public health implications.

**RI** is thus an issue of global concern, and a growing recognition of its importance is currently taking place worldwide, including the European landscape. Having fully appreciated the significance of **RI**, the Council of the European Union has thoroughly reflected on the integrity of research and innovation to conclude that (i) **RI** is key to research excellence and socio-economic relevance; (ii) research misconduct and its negative socio-economic impact should be prevented; and (iii) **RI** should be promoted both at EU and Member State level (3). Also relevant in this context is the recent release by ALLEA, the All European Academies, of a revised edition of *The European Code of Conduct for Research Integrity* (2), as well as the enhanced consideration given to **RI** by the European Commission in its research and innovation programs, as it is the case for FP Horizon 2020.

The ultimate responsibility for responsible research conduct lies with individual researchers, **RI** being therefore a personal responsibility of the scientist, who should accept individual accountability for decisions and actions, as well as for the outcomes of his/her research and their impacts. Nevertheless, researchers are part of a rather complex adaptive system, the research enterprise, being also the responsibility of the research community as a whole to promote **RI** and a responsible conduct of research (1,4). In this regard, research performing

and research funding organizations, along with scientific societies and academies, must accept responsibility for ensuring that the fundamental principles of research integrity drive the practice of science. All these institutions must inspire a responsible conduct of research among their members, foster a culture of scientific integrity and develop appropriate training activities on good scientific practice (5).

Besides integrity, responsible science involves a high-quality professional practice, ensuring precision and verifiability of the results, and striving for excellence in the proposal, performance, report and review of the research. Rigor must prevail in all instances and pervade the whole research process.

Compliance with international, national and local regulations affecting the performance of research is a must. Researchers have also an obligation to comply with ethical principles. Ethics provides a conceptual framework for deciding how to act and for analyzing complex problems and issues; a systematic way to work through dilemmas to determine the best course of action among conflicting choices. It is mandatory to consider potential ethical issues associated with the planned research, and to address them accordingly. Issues to be taken into consideration include, among others, the respect for basic human values (autonomy, freedom, dignity, nondiscrimination, privacy), animal welfare, environment, health, safety or the potential dual use or misuse of research results. In this context, it is relevant to mention that no research funded within Horizon 2020 can start without a previous ethical approval.

## References

- 1) Fostering Integrity in Research (2017) (<https://www.nap.edu/catalog/21896/fostering-integrity-in-research>)
- 2) The European Code of Conduct for Research Integrity (2017) (<http://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf>)
- 3) Council Conclusions on Research Integrity (2015) (<http://data.consilium.europa.eu/doc/document/ST-14853-2015-INIT/en/pdf>)
- 4) Research Integrity in the European Policy Landscape (2016) ([http://www.scienceeurope.org/wp-content/uploads/2016/12/Science\\_Europe\\_Open\\_Letter\\_Integrity\\_European\\_CoC\\_151216.pdf](http://www.scienceeurope.org/wp-content/uploads/2016/12/Science_Europe_Open_Letter_Integrity_European_CoC_151216.pdf))
- 5) Declaración Nacional sobre Integridad Científica (2015) (<http://www.csic.es/web/guest/etica-en-la-investigacion>)