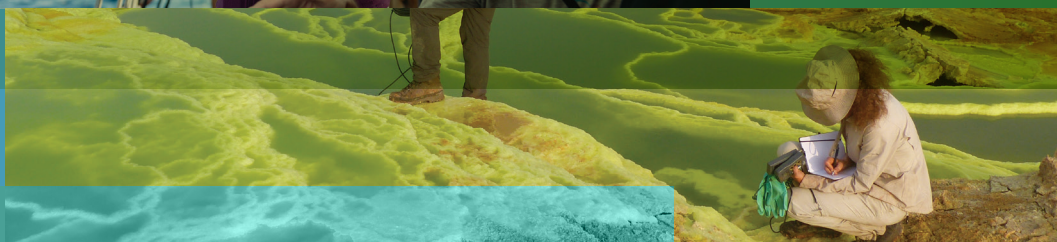
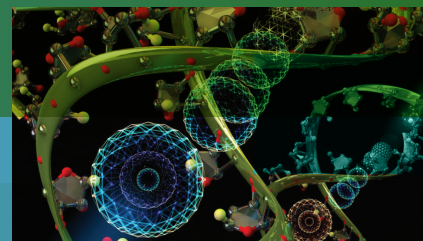


Integrity and responsibility in research practices

Guide



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CNRS ethics committee
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This guide is intended for all public research staff, regardless of their discipline, status or level of responsibility. It also aims to inform master's and PhD students about the many aspects of research, and to guide them towards responsible practices. It should furthermore provide support to all those concerned by research, including team leaders and research unit directors, when faced with integrity violations or ethical dilemmas.

This document should evolve over time, because it serves as a basis for reflection and will doubtless benefit from fresh input.

The online version of the guide (<http://www.cnrs.fr/comets/>) gives access via active hyperlinks to the many websites and documents mentioned throughout the text.

ACKNOWLEDGEMENTS

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This guide sets out the principles that feature in the French National Charter for Research Integrity, signed in 2015 by French research institutions and the Conference of University Presidents (CPU). Antoine de Daruvar, a professor at Bordeaux University, has brought an extra dimension to the text by adding a university perspective. Florence Egloff, a task officer at the Conference of University Presidents (CPU), has unfailingly and efficiently supported the development of this joint guide. Our sincere thanks go to both her and all the contributors and reviewers of this document.



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PREAMBLE

The purpose of research is to contribute to the development of knowledge and the advancement of science. It is underpinned by the principles of honesty¹, scientific integrity² and responsibility³ on which the public bases its trust in research. These principles were set out in the European Charter for Researchers in 2005. They were further developed in the Singapore Statement on Research Integrity in 2010, the preamble of which emphasises that:

"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."

In order to harmonise European policies on integrity, the European Federation of Academies of Sciences and Humanities, ALLEA, adopted the European Code of Conduct for Research Integrity in 2011 (revised in 2017), and the Council of the European Union ratified in 2015 a series of conclusions underlining the importance of integrity in research.

"Research Integrity: what it means, why it is important and how we might protect it"

- Integrity is the pillar of high-quality research.
- Open science is one of the conditions for promoting integrity.
- The chief responsibility for the integrity of research lies specifically with researchers themselves and more generally with the research institution.
- Integrity is fostered through training in best practices.

Science Europe, 2015

In keeping with these major international efforts, French research institutions and the CPU signed the first French National Charter for Research Integrity on 26 January 2015, thus committing themselves to respect and uphold the principles of integrity and rigour that are inherent to research (see the Annex to this guide).

Furthermore, a report commissioned by the French State Secretary for Higher Education and Research and published on 29 June 2016⁴ specifies how to implement the research integrity policy and how to address violations of scientific integrity.

¹Honesty refers to all aspects of everyday research practices related to the meaning, soundness and possible applications of

²Scientific integrity means the refusal to allow scientific values to be corrupted by financial, social or political pressure. Integrity is seen in terms of epistemological duties that vary according to the scientific disciplines concerned.

³Responsibility refers here to researchers' public obligations, including their duty to anticipate the effects of their findings on society as well as those relating to their attitude towards the dishonesty of colleagues or any violations of scientific integrity of which they may be aware.

⁴"Review and implementation of proposals of the French National Charter for Research Integrity" by Pr. Pierre Corvol.

By publishing in 2014 the guide “Promouvoir une recherche intègre et responsable”, COMETS intended to raise researchers⁵ awareness of responsible research practices. The guide was distributed to all research units and laboratories, and given to all new CNRS staff. It required an update in response to comments and to the rapidly-evolving research environment. Numerous research practices are being transformed by the new uses made of digital technology. Open science now offers new ways of sharing scientific data and knowledge. Scientific publishing practices are also undergoing deep-rooted change.

The CNRS and the CPU have joined forces to publish this updated version of the guide. Its content falls within the reference framework of the European Horizon 2020⁶ programme for research and innovation. It is based on European and international texts issued by the OECD, ALLEA and the European Science Foundation, among others. It is structured around the following themes, set out in the French National Charter for Research Integrity (see Annex).

The pillars of the French National Charter for Research Integrity

- Compliance with legislative and regulatory requirements
- Reliability of research work
- Communication
- Responsibility in collective work
- Impartiality and independence in assessments and expert appraisals
- Collaborative work and a plurality of activities
- Training

⁵ The generic term ‘researcher’ refers to all those who contribute to research, including researchers per se, faculty members, engineers, technical staff and PhD students. Terms such as researcher or engineer may be referred to as if masculine for reasons of simplification, but obviously cover both men and women.

⁶ The H2020 framework programme brings together European research and innovation programmes for the first time.



1. KNOWING THE GUIDELINES BEHIND LEGISLATION ON PUBLIC RESEARCH

1.1. THE FRENCH RESEARCH CODE

The general organisation of French public research is determined by the Research Code, which sets out staff objectives and mandates.

Public research staff are tasked with:

- developing knowledge;
- transferring knowledge to and applying it within companies and all fields contributing to the progress of society;
- disseminating scientific and technical information and culture to the public in general, and young people in particular;
- participating in initial and continuous vocational training;
- managing research;
- carrying out scientific expert assessments.

Research code (Art. L411-1)

1.2. RIGHTS AND OBLIGATIONS OF PUBLIC EMPLOYEES

*Research is carried out by public employees⁷ and research staff working under contract⁸. In accordance with their status, public employees benefit from political, trade union, religious and philosophical freedom of opinion. Furthermore, in keeping with their status and the French Education Code (Art .L.952-2), faculty members and researchers enjoy full independence and complete freedom of expression in carrying out their teaching duties and research activities, providing that they respect the principles of tolerance and objectivity in compliance with university traditions. This **academic freedom** concerns all channels of communication, including social networks. However, it does not free them from the moral, epistemological or social obligations that make a researcher a responsible stakeholder.*

⁷ Public employee is the term used throughout to translate 'fonctionnaire' in French.

⁸ The rights and obligations of research staff working under contract are set out in the related agreements and charters signed along with their contract.

The rights and obligations of public employees were reviewed and extended by Act no. 2016-83 of 20 April 2016. The following articles are those directly related to the ethics applicable to research professions.

Ethics, rights and obligations of public employees

- *They shall carry out their duties with dignity, impartiality, integrity and probity. They shall remain neutral and respect the principle of secularism.*
- *They shall prevent or immediately put a stop to any situation that exposes them to a conflict of interest.*
- *They have the right to receive support from an ethics adviser tasked with helping them to fulfil their ethical obligations.*
- *No action may be undertaken against public employees for having attested to or testified in all good faith to judicial or administrative authorities about facts witnessed in the course of their duties that constitute an offence or a crime, or that could be considered a conflict of interest.*
- *The law encourages the balanced representation of men and women.*

Taken from Act no. 2016-83 of 20 April 2016

1.3. SPECIFIC LEGISLATION AND REGULATIONS GOVERNING RESEARCH PRACTICES

*Research practices are governed by **legislation of** a broad scope, including laws related to plagiarism/counterfeiting⁹, intellectual property, harassment, discrimination, bioethics, biodiversity and data processing, files and freedom.*

Health and safety in the workplace come under the protection of the French Committee for Health, Safety and Working Conditions (CHSCT). The use of computer resources and internet services is governed by charters specific to each institution.

Regulations have been published on, for instance, the use of human biological samples for research and the confined manipulation of Genetically Modified Organisms. The use of animals for scientific purposes falls under a specific regulation and the French National Charter on the Ethics of Animal Experimentation.

Bioethics regulatory committees at the CNRS and certain other research institutions help laboratories gather the documents needed to comply with current regulations.

⁹ The term plagiarism is used mainly in everyday language, but—unlike counterfeiting—it has no legal value in its own right (see chapter 7).



2. RESPONSIBILITIES IN COLLECTIVE RESEARCH WORK

The recommendations specifying the roles, responsibilities and prerogatives of researchers and employers are laid out in the European Charter for Researchers, which many French public research institutions have adopted.

Researchers' responsibilities

"Researchers need to be aware that they are accountable to their employers, funders or other related public or private bodies as well as, on more ethical grounds, towards society as a whole. In particular, researchers funded by public funds are also accountable for the efficient use of taxpayers' money".

European Charter for Researchers, 2005

2.1 RESPONSIBILITIES WITH RESPECT TO WORK RELATIONS

The discrimination of employees at work is a punishable offence under public law, which states that "no distinction, either direct or indirect, may be made among public employees on the basis of political, philosophical or religious beliefs, union affiliation, origin, gender, sexual orientation or identity, age, family name, state of health, physical appearance, disability, ethnicity or race, whether real or perceived.¹⁰" The Ministry for Higher Education and Research actively tackles all forms of inequality and discrimination.

Harassment in the workplace is also a punishable offence. Situations of **moral harassment** have recently been added to the law on the rights and obligations of public employees. This protection is applicable to non-tenured employees under a public law employment contract. They may seek advice from their institution's human resources department on whether or not they are justified in making a complaint. Salaried workers, public employees and interns are also protected from **sexual harassment** in the workplace by a law that offers victims greater protection and legal security. Information about how to defend oneself in the event of sexual harassment in higher education and research establishments can be found in a practical guide for the academic world and in a dedicated datasheet published by the CNRS.

Equality between men and women is a fundamental right enshrined by Act no. 2014-873 of 4 August 2014, which includes actions that are designed, among others, to (i) guarantee professional equality, equal pay and gender diversity in professions; (ii) facilitate the reconciliation of work and other schedules and a balanced sharing of parental responsibilities; (iii) foster equal access for both men and women to electoral mandates and elected offices, as well as to professional and social

¹⁰ Act no. 83-634 of 13 July 1983 concerning the rights and obligations of public employees (Articles 6 and 6b)

responsibilities. The Ministry for Higher Education and Research has set up a plan of action to foster gender equality, and the CPU has signed a charter to promote equality between men and women within its establishments. The Council of the European Union (November 2015) considers gender equality one of its key priorities for research and innovation within Europe.

Gender equality is a fundamental right that begins with mutual respect and the rejection of any type of behaviour that relates to everyday sexism (benevolence, paternalism, etc.) or stereotyping that is demeaning for women at work.

2.1. RESPONSIBILITIES IN TRAINING PHD STUDENTS

Doctoral contracts govern the recruitment of PhD students by the higher education and research establishments¹¹. This three-year contract offers the social guarantees of an employment contract compliant with public law. PhD students and thesis supervisors are also bound by the thesis charter of their university, an agreement which defines their respective rights and duties. Since the decree of 25 mai 2016, doctoral schools have to offer PhD students training modules on research ethics and scientific integrity¹².

The **thesis supervisor** is responsible for ensuring the scientific quality and integrity of the thesis.

Recommendations for supervisors of PhD students

- Inform them about legal and regulatory texts and ethical rules, especially those in relation to human, animal and environmental research.
- Teach them the concepts and methods of the discipline.
- Train them to perform a critical analysis of scientific data.
- Teach them how to write papers, reviews and conference abstracts.
- Introduce them to standards on attributing authors and sources in bibliographical referencing.
- Make them aware of the fraudulent nature of plagiarism.
- Facilitate their access to the scientific community, external partnerships and conferences.
- Encourage them to take training courses to prepare their future career.

To avoid tensions and misconduct that may arise during the thesis, it is recommended that a research **tutor** working outside the research unit be allocated to each PhD student. In addition to monitoring the progress of the thesis, the tutor may also act as the contact point or mediator in case of conflict. If any ethical questions arise, they should first be submitted to the doctoral school for arbitration.

¹¹ There is no single doctoral contract: some institutions have similar, but not the same, contracts.

¹² The decree of 25 May 2016 provides a national framework for training and procedures leading to the award of a French doctoral degree.



3. ENSURING THE RELIABILITY OF RESEARCH WORK

3.1. DATA PRODUCTION

3.1.1. Data reliability and traceability

*La **fiabilité des données** produites par les chercheurs suppose l'adoption des protocoles de recherche*

*The **reliability of data** produced by researchers relies on the implementation of appropriate research protocols taking into account acquired and proven knowledge. Data production procedures must be described in clear and explicit terms so they can be replicated by other researchers and re-used.*

***Traceability** defines all the information on data production conditions (methods, dates, etc.). In some disciplines—particularly in experimental research—traceability is ensured by a laboratory notebook, which may be a key part of quality assurance in research settings. The laboratory notebook is compulsory for all research staff, whether permanent or under contract. It serves both documentary and legal purposes. The raw data and conditions of original experiments must be so accurately recorded in the notebook that they may be replicated. A clear distinction must be made between the results obtained and the conclusions drawn. The **ownership of information** contained in the notebook is defined by the contract between the institution and its partners. The contents of the notebook may not be reproduced without the written authorisation of the unit director. However, the writer may photocopy it for personal use without prior permission.*

Why keep a laboratory notebook?

- Archiving, traceability of raw data and the use of an unforgeable laboratory notebook are the only legal ways to prove the prior existence of results in the context of a contract, a patent application or a dispute.
- In the case of collaboration with partners, the laboratory notebook is used to estimate each person's contribution.
- It is a major piece of evidence that can be used in the event of a conflict or allegation of fraud.

The electronic laboratory notebook achieves the same objectives as the paper version. The archiving medium must be unforgeable. The advantage is that it may be integrated in a network and all the data may be recorded there. However, long-term data storage is not guaranteed due to the constant development of computer operating systems. The electronic notebook requires security, dating systems and a certified digital signature. Distributed encryption methods based on a blockchain may also be used.

*The **software programs** used to produce data are also subject to traceability requirements.*

***Data identification.** A Digital Object Identifier (DOI) ensures the constant and unique traceability of digital objects. The DOI allows individuals to access, share, re-use and cite online resources, research data and publications. It also ensures long-term access to scientific materials such as images and videos. Its use is therefore recommended.*

3.1.2. Inappropriate data management practices

The following behaviours are detrimental to the credibility of research and, in extreme cases, may even be considered fraud.

Examples of inappropriate data management practices

- Denying data access to colleagues.
- Producing biased or manipulated data under the pressure exerted by sponsors funding the research.
- Interfering with or obstructing other researchers' work, especially by making data, research material or equipment unavailable or unusable.
- Using data belonging to a third party without prior authorisation or without citing the author and sources.

3.1.3. Management of big data

*Research is increasingly reliant on the use of 'big data', a term that generally refers to an aggregation of data acquired by teams located all over the world who agree to **data sharing**, i.e. making their data available to all. Data from research financed through public funding must be made freely available, which is the very principle of **open data**. Indeed, this is stated in the French Research Code (Art. L.112-1) and forms part of the objectives of both the European Horizon 2020 programme, and the French Digital Republic Act of 2016¹³, which makes access to scientific data mandatory (Art. 9).*

The use of big data, from production to sharing, must fulfil the requirements for scientific relevance, rigour and loyalty. It must also satisfy the need for security as well as ethical and legal considerations. The Charter for Ethics & Big Data ¹⁴ was issued to facilitate the creation, dissemination and use of big data while complying with legal and ethical requirements. By adopting this charter, users undertake to adhere to the following principles.

¹³ Act No. 2016-1321 of 7 October 2016.

¹⁴ This charter is self-administered. It provides a descriptive framework for databases and serves as a memorandum of the points that must be covered when data are made available for whatever purpose, be it commercial or academic, paid for or free. The items included in the charter must be completed by the supplier, who is thus responsible for its content.

A few recommendations on the use of big data

- Compliance with data traceability principles.
- Transparency in data-handling practices.
- Respect of intellectual property rights.
- Compliance with general and specific legislation, particularly concerning the use of personal data

Ethics & Big Data Charter

Four international organisations have signed the "Open data in a big data world" agreement¹⁵, which lays down the basic principles to be adopted when using open data, along with recommendations on how to combine scientific rigour and ethics. However, these principles are not fully compatible with those of France's National Commission for Information Technology and Civil Liberties (CNIL) in the case of personal data.

3.2. PROTECTION OF PERSONAL DATA

In France, CNIL is responsible for the protection of personal data. Their use is currently governed by the French law on information technology, data files and civil liberties. This has recently evolved with the publication of a European regulation which strengthens and unifies data protection for all individuals within the European Union. Information Technology and Civil Liberties (CIL) correspondents provide a link between higher education institutions and CNIL¹⁶.

According to CNIL, the use of personal data should fulfil a number of obligations, the main ones being outlined below. However, CNIL requirements on purpose and proportionality are difficult to apply to current research carried out using big data¹⁷.

Main obligations when collecting and processing personal data

- Secure files (premises and information systems).
- Ensure data confidentiality.
- Accurately indicate the purpose of data collection and processing ('purpose principle').
- Define the quantity of personal data to be collected and the period of data storage according to the purpose ('proportionality principle').
- Allow individuals involved in the study to be informed.
- Submit any personal data processing operations at particular risk of violating rights or freedom to CNIL for approval.
- Ensure that the information used in a file matches the objectives.

CNIL

¹⁵ The International Council for Science – ICSU, the Inter Academy Partnership – IAP, the World Academy of Sciences – TWAS and the International Social Science Council – ISSC.

¹⁶ The CPU published a guide in 2011 called "Information Technology and Civil Liberties for Higher Education and Research", which sets out the conditions under which students' personal data should be managed.

¹⁷ As indicated above, 'big data' is a term for data created through the aggregation of results obtained by various teams who have no way of knowing what the data will be used for or how long they will be stored. Furthermore, processing big data can lead to incoherency in the way the information is used.



4. SCIENTIFIC PUBLICATION - COMMUNICATION

Researchers are ethically obliged to make their research findings available to both the scientific community and the public. Those who receive public funding are legally obliged to do so. The development of digital technologies has transformed the way results are communicated.

This communication comprises three different stages¹⁸: publication, qualification and certification.

Publication means any act that makes research findings public through journals, conference proceedings, open archives, blogs, websites, tweets, etc. Research is in most cases **qualified** by peers through a peer review, during which they assess, among others, scientific relevance, originality, suitability of methodology and protocol, adequacy of the cited sources, quality of writing, etc. It can also be qualified through discussions on scientific social networks. A document may be **certified** by an editorial board before its inclusion in conference proceedings or a journal.

4.1. PREPARATION OF MANUSCRIPTS: RECOMMENDATIONS AND MISCONDUCT

Manuscripts must be prepared in compliance with 'good practices' and the principles of integrity¹⁹. The following recommendations and examples of misconduct are not exhaustive and should be adapted to each academic field.

Guidelines for the preparation of manuscripts

- Data must be reliable and collected in good faith.
- Results must be interpreted rigorously and objectively.
- Experimental protocols must be sufficiently well documented and open to allow other teams to reproduce them.
- Raw data must be accessible insofar as the discipline allows.
- References must be pertinent and refer to work already published by the authors and other teams.
- The authors must cite the works that stimulated the questions raised and hypotheses considered.
- The person in charge of publication must obtain the approval of all the manuscript's authors before submission.
- All authors must disclose any conflicts of interest.
- All authors must agree on the sequence of authors, preferably at the start of the project or initiation of the publication process.

¹⁸ Comets (2016). "Discussion and moderation of scientific publications on social networks and in the media: ethical issues".

¹⁹ These recommendations were inspired, among others, by the guide: On being a scientist: a guide to Responsible Conduct in Research. The National Academies Press (2009), Washington D.C.

Examples of misconduct (whether inappropriate or fraudulent)

- **Fabrication*** of results.
- **Falsification*** (unjustified exclusion or manipulation of data or images).
- **Plagiarism** of research carried out by a third party.
- Intentional misrepresentation of findings or research carried out by competitors.
- Dissimulation of conflicts of interest.
- Overestimation of the applicability of research findings.
- Deliberate omission of contributions made by other authors in the references.
- Incorrect indications on the progress of the researcher's own work with respect to publication.
- Addition of "guest" or "ghost" authors to the list of authors as a favour.
- Omission of anyone who made a significant contribution to the project from the list of authors.
- Mention of co-authors without their consent.
- Re-publication of parts of previous publications without citing the original source.

* Fabrication, falsification and plagiarism are considered fraud (see chapter 7)

4.2. WHO CAN CLAIM AUTHORSHIP OF A PUBLICATION?

The increasing importance of publications in the development of careers and funding of research has led to the multiplication of authors and is often a source of conflict. The notion of authorship depends widely on academic fields. General recommendations for authorship have been set out by The International Committee of Publication Ethics (COPE)²⁰. They have been adopted by the French National Alliance for Life Sciences and Health (AVIESAN) and are also approved in some other scientific fields.

Who can claim authorship of a publication?

- The author of an article must make a direct and substantial intellectual contribution to the research process, from conception and measurements to interpretation of data or drafting of the publication.
- The author must be able to defend all or part of the publication content.
- The project leader (corresponding author) guarantees the accuracy of the publication content as a whole. The other authors are responsible for verifying and attesting to the truth of the assertions made.
- All the authors of a published work must share its benefits.

²⁰ COPE is a forum for publishers of peer-reviewed journals where they discuss ethical issues relating to publications.

4.2.1. Authorship conventions

Numerous journals publish **guidelines that outline authorship conventions**. Some journals have 'author contribution' procedures, which allow authors to specify their respective contributions and makes them individually accountable. If two main authors contributed equally to the work, they can ask the publisher to be **co-first authors**, in which case a specific mention is made as a note in the published article. Authorship conventions depend on the field of research and therefore vary from one research team to another. To avoid conflicts, researchers are advised to openly discuss and agree upon authorship and the order of authors well ahead of publication. This is especially important in the case of joint research. Generally speaking, this sensitive issue should be discussed within research units and authorship recommendations included in the **laboratory's internal regulations**.

When the publication results from **multidisciplinary research**, authors may not always be able to judge whether the results obtained by partners from another discipline are well-founded. It is therefore useful to identify the author(s) able to evaluate the results obtained in each field and those who will guarantee the coherence and integrity of the whole work throughout the publication preparation phase. This avoids all the authors being accused, should the publication be found to be fraudulent.

It is important to comply with institutional **conventions of author affiliation**, which allow the unequivocal identification of an author's publication and the institution (research organisation or university) to which the author belongs. The established lists may be used both to assess the author's work and to assess and rank the institution. In 2015, French research organisations published a charter specifying the affiliation conventions²¹ for the institutions to which research units belong. The order of institutions is determined for each laboratory and must be mentioned in its internal regulations.

The use of **ORCID ID** (Open Researcher and Contributor IDentification) allows researchers to be identified clearly and unambiguously. This **unique digital identifier** avoids any issue with namesakes or name changes. It can be used to respond to a call for projects, submit an article, deposit data sets and to become more visible on social networks, etc.

4.2.2. Participation of engineers and technicians as co-authors

The co-signature of publications by engineers and technicians may be a major step forward in their careers. This is a sensitive and complex matter, and the way it is handled depends largely on disciplinary practices and professional activities. Researchers are advised to discuss the subject during laboratory meetings and to **include guidelines about signatures in the internal regulations**.

4.2.3. Acknowledgements

Those who do not fulfil the criteria for authorship of a publication but have been involved in the research work (technical assistants, material suppliers, colleagues who contributed to discussions or proofreading of the publication, etc.) should be mentioned in the acknowledgements. All those included in the acknowledgements must give their prior consent. Sponsors and funding institutions must also be acknowledged.

²¹ For all joint research units belonging to a university and/or other institutions, each and every institution shall be identified in publications by a standardised affiliation, usually specified in the research unit's agreements.

4.3. PUBLICATIONS AND OPEN ACCESS

Open access refers to the free online availability of original results of scientific research. The right to open access is enshrined in the French Digital Republic Act, which stipulates that publications must be available to the public after an embargo of 6 months maximum (12 months for Social and Human Sciences) following their acceptance by the publisher. Open access to publications resulting from research funded even partially by the European Horizon 2020 programme is obligatory.

Open-access journals allow articles to be immediately available on the internet. The authors and/or institutions assume the cost of publication in the form of an Article Processing Charge (APC). Authors should remain vigilant in view of the proliferation of second-rate online journals created by 'predatory publishers'. Open-access journals subject to a peer review are listed in the Directory of Open Access Journals (DOAJ)²².

Articles published in **traditional journals**²³ may become open-access after the legally-defined embargo period.

Multidisciplinary repository platforms such as ArXiv, HAL (Hyper Articles en Ligne) and bioRxiv allow researchers to deposit articles and various manuscripts online (including theses, conference papers or review articles as a preprint or final version). It is strongly recommended to publish PhD theses on HAL, as the platform provides an archiving and indexing system that is particularly useful for the career development of young doctorates or researchers. HAL also fulfils the requirements of the Horizon 2020 programme.

4.4. PUBLICATIONS AND SOCIAL NETWORKS

Some scientific social networks (such as Academia, ResearchGate or MyScienceWork) are designed to facilitate communication between researchers and give their work visibility. Researchers can not only notify their publications on these networks but also deposit them on the website, which must be used in accordance with rules of good conduct²⁴. Researchers are individually responsible for the work they deposit, and not the employing institution, even if its name is mentioned. Importantly, by uploading the publication to these websites, the author hands over all rights concerning it. Any publication thus deposited becomes the exclusive property of the network, which is then free to exploit it as it likes, particularly for commercial purposes.

4.5. COMMUNICATING RESULTS TO THE PUBLIC AND THE MEDIA

Researchers must make their knowledge and research activities available to the public, so that non-experts can understand the evidence and advantages²⁵. Public research staff benefit from the freedom of expression and opinion but also have a duty to ensure discretion, confidentiality, neutrality and transparency about their personal links of interests. Holders of grants awarded within the framework of

²² The list of these journals is jointly established by a group of a few dozen publishers of international scientific journals.

²³ The cost of these publications is not met by the author but by the reader or the institution.

²⁴ See the conditions on the use of social networks for distributing publications recommended by CIRAD.

²⁵ The CNRS has published a guide on good practices for laboratory communication designed to raise the profile of research, especially among institutional partners, players in economics, regional authorities and the general public.

Horizon 2020 programmes must provide information on their research findings to various audiences, including the media and the public.

Researchers are responsible for the reliability and objectivity of the information they communicate. They may have to express their opinions publicly or in the media on sensitive or controversial subjects on which there are no simple or unambiguous answers. They must be honest and make a clear distinction between scientific knowledge and their own personal opinions,²⁶ which do not benefit from any particular kind of legitimacy resulting from their status as a researcher.

Social networks and blogs are becoming an increasingly key source of information for the public and the media. Researchers should be aware of the impact that the information they communicate via these means can have, and are responsible for ensuring that is reliable and objective, in the interest of science and respect of their institution.

²⁶ On ethical aspects of researchers' communications with the media (COMETS, 2012)



5. INTELLECTUAL PROPERTY RIGHTS

*Intellectual property*²⁷ refers to **literary and artistic property** (copyright, database rights), and **industrial property** (protection of inventions and technical expertise). It is governed by the *Intellectual Property Code*, which recognises ownership rights for intellectual or aesthetic works as well as technical inventions.

5.1. LITERARY AND ARTISTIC PROPERTY

5.1.1. Copyright

The CNRS has published a guide that gives concrete answers to questions about rights in relation to publications, open archives, visual aids, software, teaching materials and PhD theses.

Scientific publications fall within the legal framework of *literary and artistic property*. Researchers own all the moral and economic rights of their written work, despite being public employees²⁸. Transferring copyright to a publisher may prevent the automatic re-use of the researcher's work in other formats or in future compilations. It often takes away the author's right to re-use parts of the text submitted. Authors are strongly advised to carefully read the contract and discuss clauses in detail with the publisher. They are also advised to use *Creative Commons* (CC) licences, which allow copyright holders to keep their rights while making their work publicly available under predefined conditions.

Author's rights

- The author and co-authors hold all the rights pertaining to their manuscript until they sign a contract transferring their property rights to the publisher.
- The article as a whole is subjected to copyright.
- The published images and illustrations can be re-used in keeping with the conditions indicated in the contract with the publisher.
- Publishers can re-use parts of an article in another context if the property rights have been reassigned to them and if such re-use is mentioned in the contract.

<http://www.cnrs.fr/dist/>

Visual aids (images, slides, videos, posters, etc.) are also subject to copyright and can be protected by a CC licence. The use of images published on the internet requires the author's consent or must be in accordance with the CC licence.

²⁷ For an exhaustive study, see http://www.cnrs.fr/dire/termes_cles/propriete-intellectuelle.htm

²⁸ French 'DADVISI' Act of 1 August 2006

Depositing articles in open archives

- Depositing a text in an open archive counts as publication.
- Depositing the full text of an article in an open archive requires the co-authors' agreement.
- Authors can manage the rights pertaining to their own work by using a Creative Commons licence.
- The full text of a published article can be made available on a personal website if so permitted by the contract with the publisher. It may also be deposited in HAL.

Teaching materials are copyright-protected. Authors can choose between different levels of protection for each teaching material using an appropriate CC licence. The re-use of materials for teaching or research purposes is permitted within the scope of the educational exception²⁹.

Databases are covered by a law that offers protection through copyright and by a specific *sui generis* property right for database creators. Open licences such as the Open Database License (ODbL) are specifically developed for databases.

Software is also subject to copyright legislation. The research institution owns the rights to any software developed by its employees, but it may grant the right to use and/or market the software.

5.2. INDUSTRIAL PROPERTY - PATENTS

Any laboratory research finding that may have an economic interest (new product, molecule, material, process or know-how) can be transferred.

If the result is novel, inventive or could be developed into an industrial application, a patent may be filed³⁰. Institutional knowledge exploitation departments will take steps to ensure the protection of intellectual property rights. A patent grants its owner temporary exclusivity within a given geographical area (e.g. a country or Europe). It protects not only the invention of a product or process from reproduction, but also—and especially—the rights of its creator(s) in the event of industrial exploitation. Patent applications can only be made if the research has never been published in any oral or written form. This includes the publication of articles, theses, posters and conference papers.

The research institution is responsible for the reliability of the studies underpinning the patent. The purchase of a patent by a private company establishes the liability of the institution, which may face lawsuits in the event of inaccurate or fraudulent research.

If the invention developed in a laboratory cannot be patented but may still be exploited commercially, the institutional knowledge exploitation department transfers the expertise to a company.

²⁹ Educational exceptions permit the use of works for illustrative purposes only for an audience of students or researchers within a teaching or research environment and exclude all commercial use.

³⁰ See reference materials on the CURIE network, which is for professionals capitalising on public research through technology and innovation transfers.



6. EVALUATION AND EXPERT ASSESSMENT

6.1. RESEARCH EVALUATION

The aim of evaluation activities is to assess the quality of research in relation to publication, career development or strategic objectives, or funding requests etc.

6.1.1. Recommendations for scientific evaluators

Evaluation entails the evaluator's responsibility. Faced with an increasing number of national and international evaluations, the evaluator's task may lead to a conflict of interests and tension. It may even foster misconduct such as the appropriation of ideas or plagiarism. The following recommendations are designed to help evaluators avoid such inappropriate behaviour.

Some recommendations for scientific evaluators

- **Scientific excellence**
 - They must demonstrate a broad understanding of their discipline, open-mindedness and integration skills, particularly when evaluating multidisciplinary research.
 - Evaluators must ensure that the experts they have appointed to assist them have complementary skills and points of view while avoiding conflicts of interest.
- **Impartiality and conflicts of interest**
 - Evaluators have a duty to give equal attention to all research work.
 - They must step down if they consider that a conflict of interest may jeopardise their impartiality.
 - They must refrain from evaluating research carried out by a colleague whose activity was recently linked to their own.
 - They must refrain from intervening in decisions on a research project that could be in competition with their own.
- **Confidentiality**
 - They must preserve the confidentiality of deliberations.
 - The information gathered during their evaluation must not be used for either themselves or their laboratory.
 - They must report any infringement of ethical standards by the researchers or research projects evaluated.
- **Transparency**
 - Their conclusions must be explained and justified so that they can be defended in the event of an appeal.
 - Those researchers concerned must have access to the elements upon which the evaluation is based.
 - If valid objections are raised, evaluators cannot refuse to participate in the subsequent investigations.

6.1.2. Evaluation and bibliometric indicators

Bibliometric indicators are often used to evaluate scientific work. The best-known indicators are the journal impact factor (IF) and the Hirsch index (h-index) for researchers³¹.

*The **Hirsch index** (h-index) estimates the significance, scope and impact of all a researcher's publications combined. A researcher's h-index is equal to or greater than N if he has published N articles that are cited at least N times. The h-index increases in keeping with the researcher's career advancement and generally has little meaning for young researchers. It does not take into account the number of co-authors or the author's position among them. It favours researchers in disciplines using many citations. The use of the h-index is not appropriate in certain disciplines such as SHS.*

*The **impact factor** (IF) of a scientific journal measures the yearly number of citations of articles published in that journal over the previous two years, compared to the number of articles published by the journal over the same two years. It should be noted that the strategy of giving priority to journals on the basis of their impact factor is not without bias³². Some generalist journals with a broad readership do not select articles only because of their academic excellence, the chief editor sometimes chooses them according to their 'trendiness'. Furthermore, the impact factor of a generalist journal is a global mark, and does not provide any detailed information on the rate of citations, which may vary according to fields of research.*

In the light of the frequent inappropriate use of bibliometric indicators when evaluating research, publishers of scientific journals, academies and institutions all over the world published in 2013 the "San Francisco Declaration on Research Assessment" (DORA), which calls on evaluators not to use the IF to evaluate researchers' activity. The Leiden Manifesto³³ has set out general principles that should enable a better use of bibliometric indicators when evaluating research.

10 principles for a judicious evaluation using bibliometric indicators

- Quantitative evaluation should support qualitative, expert assessment.
- Measure performance in relation to the research missions of the institution, group or researcher.
- Protect excellence in locally-relevant research.
- Keep data collection and analytical processes open, transparent and simple.
- Allow those evaluated to verify data and analysis.
- Account for variation by field in publication and citation practices.
- Base assessment of individual researchers on a qualitative judgement of their portfolio.
- Avoid misplaced concreteness and false precision.
- Recognise the systemic effects of assessment and indicators.
- Scrutinise indicators regularly and update them.

Leiden Manifesto, 2015

³¹ Alternative indicators known as Altmetrics have also recently emerged. They measure an article's potential and immediate impact by analysing its dissemination and discussion on social networks (Twitter, Facebook and mentions on blogs and wikis).

³² French Academy of Sciences report (2014): The new challenges of scientific publishing.

³³ Hicks et al., Bibliometrics-the-leiden-manifesto-for-research-metrics-Nature, 2015, 520, 430-1.

6.2. EXPERT ASSESSMENT

Expert assessments are mostly commissioned by people outside the scientific community (politicians, entrepreneurs, associations, etc.). They aim to provide, in response to a specific issue, an interpretation, opinion or recommendation founded as objectively as possible on the basis of available knowledge and demonstrations along with a professional appraisal³⁴.

A National Charter for Institutional Expert Assessments was published in 2010 for research institutions. It was designed to ensure the transparency of scientific expert assessments and each research institution has implemented its own version geared to its needs.

The employees of research institutions may also be **approached individually to carry out an expert assessment**. Some general recommendations applicable to this particular case are outlined below.

A few recommendations for individual expert assessments

- The expert assessment has to be informative but should not be used to endorse any political or economic decisions made as a result.
- Experts are free to express their personal opinions but they must indicate that their own opinions do not reflect the opinion of their institutions.
- Experts must highlight any uncertainties surrounding their appraisal. They must remain vigilant about how their opinions may be used by decision-makers and the media. This recommendation is particularly important in crisis situations (where risks may be related to natural disasters, health or food, for example) when a decision has to be made quickly on an issue that has no simple solution.

6.3. AFFILIATIONS AND CONFLICTS OF INTEREST

Expert assessments and the funding of research by sponsors create profitable **relations** between academic research and businesses. However, such affiliations are also likely to result in **conflicts** between private interests and the duties of public employees. They can also undermine the independence of research³⁵. Professional, personal or financial considerations may prompt researchers to change the design of a study, stop it, prevent its publication or manipulate the results to serve the interests of a private sponsor. The scope of conflicts of interest in public institutions and the obligation of transparency that binds all public employees are enshrined in the Act of 20 April 2016 on the rights and obligations of public employees.

It should be remembered that regulations apply in the public sector to the **simultaneous pursuit of different activities**. Public employees and researchers under contract alike must devote their

³⁴ AFNOR standard X 50–110 on quality in expertise activities

³⁵ It should be noted that affiliations do not necessarily imply a conflict of interest.

professional activities to the public sector. They are nonetheless allowed to carry out activities outside the institution under certain conditions and providing that these activities are related to their mandates (teaching, consultancy and expert appraisals) or capitalisation of their research. Certain activities may be subject to the institution's prior approval.

6.3.1. Whistleblower protection

Act no. 2013-316 of 16 April 2013³⁶ gives everyone the right to inform the public of a serious threat to public health or to the environment. This law gives all company employees the right to alert staff representatives on the CHSCT health and safety committee or indeed any other employee. The Act of 20 April 2016 on the ethics, rights and duties of public employees now protects such whistleblowers. Public officials cannot be punished for reporting a conflict of interest in good faith and no measures may be taken to impede their careers.

³⁶ See Article 1 of this law on the independence of expert assessments in the area of health and the environment, and the protection of whistleblowers.



7. PREVENTING SCIENTIFIC FRAUD

The violation of scientific integrity discredits research studies, damages the institution's reputation and also undermines the public's trust in researchers and science in general. These concerns were all raised in the conclusions of the report on research integrity published by the Council of the European Union in 2015³⁷.

Questionable practices affect all stages of the research process. Misconduct involving publications, conflicts of interest and inappropriate behaviour in relation to other people have already been mentioned in previous chapters. Other questionable practices concern, among others, the misrepresentation of scientific achievements in a CV or list of publications, the overstatement of the applicability of research in publications, funding requests or among the public. Some such practices are **fraudulent** in nature, as explained below.

An international consensus defines **scientific fraud** as serious and intentional misconduct in research practices and the dissemination of results, thus excluding mistakes made in good faith or honest differences of opinion.³⁸ The international scientific community agrees on the definition of three main types of fraud: fabrication, falsification and plagiarism (or 'FFP'). In France, the fabrication and falsification of data do not generally come under criminal law, and any punishment is usually dealt out by the scientific community, notably through disciplinary procedures. Plagiarism may be punishable by civil or criminal law if considered as counterfeiting³⁹.

7.1. PLAGIARISM

Plagiarism is the misappropriation of somebody else's idea or content (text, images, tables, graphics, etc.) in part or as a whole without the permission of the author or without correctly referencing the source. It affects not only publications in journals or books, but also PhD theses, reports and conference proceedings, etc. Easy access to online documents makes the use of 'copy and paste' commonplace, making it easy to forget that plagiarism is a form of intellectual dishonesty and fraud.

PhD students may not be aware of the standards for referencing sources. It is therefore the thesis supervisor's duty to inform them. Plagiarists are liable to disciplinary procedures and, if plagiarism is discovered in a PhD thesis, to the cancellation of the doctoral degree. PhD theses published online are protected by the Intellectual Property Code. It is illegal to represent or reproduce theses in whole or in part without the author's permission (Art. L112-1). The same applies to their translation or adaptation (Art. L 122-4). Anti-plagiarism software can have a preventive effect. Most higher education institutions now have specific programs, particularly to check the work of master's and PhD students.

³⁷ "The Council of the European Union EMPHASISES the need for measures to prevent and address research misconduct, including questionable research practices; INVITES research organisations and Member States to find appropriate channels for the examination of allegations of misconduct made against researchers and, if appropriate, institutions where research misconduct takes place; and HIGHLIGHTS the role that education, training and lifelong learning at different stages of the researchers' careers can play in this respect."

³⁸ CNRS, Le Journal, 2014: "Fraude: mais que fait la recherche?" [What is research doing about fraud?]

³⁹ Plagiarism does not have a legal definition. Counterfeiting of intellectual works is the only punishable offence of this type in France under civil law (damages) and criminal law (up to three years' imprisonment and a €300,000 fine) (Art. L335-2 of the Intellectual Property Code).

The publishers of major scientific journals share a database containing all the manuscripts submitted to them. Dedicated software programs are used to detect potential plagiarism. The Office of Research Integrity (ORI) has published an online guide to ethical writing, which includes a focus on plagiarism and self-plagiarism. Researchers can use anti-plagiarism software to check the originality of their own work and to help them reference sources correctly. In all cases, it is very important to explicitly cite all sources, including online ones. Texts that are copied from a published document must be written in italics and/or between quotation marks.

The appropriation of information contained in tenders for projects or in publications submitted for evaluation or expert assessment may be considered as **a theft of intellectual property**. The same applies to ideas developed during meetings, debates or seminars. This misappropriation of ideas is ethically unacceptable but difficult to prove unless the discussions have been recorded in the minutes of evaluation bodies, for instance. From a legal point of view, the 'idea thief' is not guilty of misconduct or an offence as long as only the ideas are appropriated and not the form in which the ideas are expressed. Only ideas that have been formulated and published may be protected.

7.2. FALSIFICATION AND FABRICATION OF DATA

The falsification and fabrication of data are among the 'major frauds' uncovered in recent years. Life and health sciences are often quoted⁴⁰, but hard sciences and social sciences are also affected, as highlighted on the Retraction watch website, which regularly reviews retracted publications. The majority of articles are retracted because of fraud, though some are due to mistakes made in good faith. Fraud in publications (whether plagiarism, manipulated data or other) is also revealed through websites such as Pubpeer where people can leave comments that are usually anonymous. Fraud can have serious consequences, not just for the field of research concerned, but also for society if the fraud impacts health issues or public policy. Even when a fraudulent publication is identified, it can take several years to retract the publication, which will often continue to be cited long after the retraction.

To limit falsification, the publishers of scientific journals have issued recommendations for authors, and many require that the raw data be provided, a condition that can be only fulfilled in certain disciplines and for certain types of research.

7.3. ALLEGATIONS AND HANDLING OF SCIENTIFIC FRAUD

The recommendations of the French National Charter for Research Integrity and the European Code of Conduct for Research include **reporting scientific fraud** and scientific integrity violations. Whistleblowers must be aware of the gravity of their accusation, and any allegations must be based on factual, reliable and verifiable arguments. Allegations may not only impact the suspected person but also fellow researchers and even the image of the laboratory concerned. Whistleblowers are advised not to act alone but be supported by collaborators or colleagues who can confirm their testimony. If the issue cannot be solved within the laboratory, it is best to pass the allegations on to the institution's integrity adviser, who has to respect confidentiality regarding both the whistleblower and the suspected person.

⁴⁰ Fanelli, D. How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data: PLOSone, 2009, 4, e5738; Van Noorden, R. The trouble with retraction, Nature, 2011, 78, 26-28; Fang F., Steen G., Casadevall, A., Misconduct accounts for the majority of retracted publications, PNAS, 2012, 109, 17028-33

Scientific fraud is handled differently according to the country. In the United States, fraud is considered as a misuse of public funds and offenders are liable to legal penalties such as a fine or even a prison sentence⁴¹. **In France, cases involving the violation of research integrity** are handled by the research institution concerned. Whistleblowing is not anonymous, but the procedure is strictly confidential. Any suspected misconduct is examined by one or more independent experts free of any conflict of interest. The experts' report is used as the basis for the verdict, which is determined by the Commission Administrative Paritaire (a joint administrative committee) in the case of CNRS researchers, by a disciplinary committee for university personnel or a committee made up of members of the Board of Governors of their university for faculty members. The institution's management decides on appropriate penalties and/or compensation, or, if no evidence of fraud is found, restores the researcher's reputation.

Preventing scientific fraud is a major international concern. By facilitating access to primary research data, the recent international **open science** movement⁴² should help avoid the publication of false results or questionable analyses. Among other things, it is indispensable to decrease the publication pressure on researchers.

The creation in March 2017 of the French Office for Scientific Integrity (OFIS) is expected to give a national impulse and a framework to the quest for scientific integrity.

⁴¹ The Office of Research Integrity (ORI) handles accusations of fraud and misconduct within the framework of research funded by the French Ministry of Health, and its judgements are nominally reported in a News Letter that is publicly available.

⁴² See the White Paper by CNRS's Scientific and Technical Information Department (DIST): "Open Science in a Digital Republic"



8. RESEARCHERS' RESPONSIBILITY TO SOCIETY

Recommendations have been made throughout this guide to provide research staff with useful information and help them in their daily practices. The need for a rigorous, honest and responsible scientific approach is a global concern. In its 2015 report, the Council of Europe confirmed that research integrity forms the basis of high-quality research and is vital in order to achieve top-level research and innovation. Knowledge of the laws of nature and of society has been revealed over centuries and must be constantly consolidated. Researchers today therefore have a strong responsibility to the scientific fields in which they have chosen to work.

It is also important to emphasise researchers' responsibility to society. One of the aims of science is indubitably to contribute to the common good of humankind. Yet the relationship between science and society has altered profoundly over the course of history. The advances in technology that result from scientific discoveries cannot generally be foreseen. Today, the notion of progress has been called into question due to growing awareness of the impact of technologies on the environment and human health. Researchers and research institutions cannot avoid the scientific questions that citizens are asking, and need to use their knowledge to shed light on such issues.

There is an urgent need to consolidate the relationship of trust between scientists and citizens. In a world shaken by successive crises and controversies on sensitive matters, researchers have to listen to the public's questions on the impact of their research. Now that the public has become aware of new types of risk, public opinion has become increasingly divided between admiration for the meteoric progress of science and worry over some of its applications. Moreover, the complexity of phenomena means that unequivocal answers to scientific controversies are not always possible. Without denying the autonomy of the scientific world, and as recalled by UNESCO's 1974 Recommendation on the Status of Scientific Researchers, updated in 2016, researchers should give serious thought to the responsibility that frames their intrinsic liberty.



GLOSSARY

ALLEA: European Federation of Science Academies
COMETS: CNRS Ethics Committee
CPU: Conference of University Presidents
CHSCT: French Committee for Hygiene, Safety and Working Conditions
CNIL: National Commission for Data Protection and Liberties
DOI: Digital Object Identifier
COPE: International Committee on Publication Ethics
AVIESAN: French Life Sciences and Healthcare Alliance
ORCID: Open Researcher and Contributor ID
APC: Article Processing Charge
DOAJ: Directory of Open Access Journals
HAL: Link to online articles
CC: Creative Commons
IF: Impact Factor (journal)
H: Hirsch index
ORI: Office of Research Integrity
OFIS: French Office for Scientific Integrity

ANNEX: THE FRENCH NATIONAL CHARTER FOR RESEARCH INTEGRITY

SIGNATORY INSTITUTIONS (26 JANUARY 2015)

The CNRS, INRA, INSERM, CIRAD, IRD, INRIA, INED, Institut Curie, Institut Pasteur, IRSTEA, APHP, IFREMER, IfSTARR and the universities, represented by the CPU.

PREAMBLE

In a knowledge and innovation society marked by acceleration in the construction and transmission of knowledge and by international competitiveness; public higher education and research establishments and institutions are in a privileged position to address current and future challenges. They are responsible for the provision, dissemination and transmission of decisive advances in knowledge, and contributing to the implementation of a qualified expert evaluation, notably by providing guidance for public decision-making. However, the application of this major responsibility implies consolidating the relationship of trust between research and society.

The aim of a French National Charter for Research Integrity is to clarify the criteria which define a rigorous and integrated scientific approach, and notably one which is applicable in the context of all national and international partnerships.

This Charter constitutes a French national version of the main international texts in this field: the European Charter for Researchers (2005); the Singapore Statement on Research Integrity (2010); the European Code of Conduct for Research Integrity (ESF-ALLEA, 2011). The Charter falls within the reference framework put forward in the European research and innovation programme, HORIZON 2020.

It is the individual responsibility of every public body and institution involved in research and education to implement this Charter by promoting best practices in research, through training and raising the awareness of both their staff and their students, by setting out ethical markers and establishing clear procedures known to all, with the aim of preventing and addressing any potential divergence from the Code of Ethics.

It will be up to each institution to adapt this Charter as appropriate to the disciplines and professions concerned.

THE CHARTER

French National Charter for Research Integrity concerns all women and men (referred to in the text by the generic term 'researcher') forming part of an institution or body, whether permanent staff or not, who contribute to a research activity and who undertake to respect the principles of integrity expressed herein, in the context of those research projects in which they are involved, either directly or indirectly.

1. Compliance with legislative and regulatory requirements

Any researcher should ensure that they remain informed and up-to-date concerning the legislation and regulations which govern their professional activities and that they comply with any such legislation, notably that covering research on human subjects, animals and the environment.

2. Reliability of research work

Researchers must respect the commitments undertaken by their research unit or for any specific contract. They must always use the most appropriate methods to conduct any research project.

A detailed description of the research protocol, through the use of laboratory notebooks, or any other media, must enable the reproducibility of the experimental work.

All raw results (which are the property of the institution) together with the resulting analysis must be conserved to enable their verification.

The conclusions must be based on a critical analysis of the results and possible applications should not be unjustifiably amplified. The results should be communicated in their entirety in an objective and honest manner.

All research will naturally rely on previous studies and outcomes. The use of these sources must be shown by explicit referencing on the occasion of any scientific production, publication and communication. In certain situations, their use may require prior authorisation to be obtained.

3. Communication

It is the vocation of research outcomes to be brought to the attention of the scientific community and the public, with any earlier intellectual and experimental contributions and intellectual property rights being appropriately acknowledged.

Such work is often collective and, when this is the case, any decision to publish must be taken collectively, with each author being granted intellectual property rights. Authorship should be based on an explicit role in the work carried out and all persons having fulfilled such a role should have their authorship acknowledged. Contributors who do not qualify for the status of author according to international criteria must be included in the 'acknowledgements' section of the publication.

The notion of freedom of expression and opinion is applicable within the legal framework of public service, with a duty of reserve, confidentiality, neutrality and transparency of any personal connections or interests. On each occasion, the researcher shall clearly indicate whether they are intervening in a personal or institutional capacity, and distinguish between that which results from their scientific expertise and that which is based on personal convictions.

Any communication made via the social networks must respect the same rules.

4. Responsibility in collective work

Through their professional activities, the researcher undertakes those tasks entrusted to them by their employer, according to the rules of good practice current within that institution.

Those responsible for collective work and, more generally, those researchers having a supervisory and educational role, must devote sufficient attention to sharing the collective project, clarifying the contribution and developing the skills of all those involved, thus creating a collective dynamic.

Respectful work relationships should be encouraged, with discrimination, harassment and abuse of authority being considered professional misconduct.

The falsification or fabrication of data and plagiarism are deemed the most serious breaches of integrity. They must be reported to the institution concerned and fought against.

5. Impartiality and independence in assessment and expertise`

During the evaluation of a research project, a laboratory or a colleague, the researcher shall examine all files with impartiality, stating any personal connection and withdrawing should they find a potential conflict of interest, incompatible with an impartial assessment. They are required to respect the confidentiality of any deliberation and to refrain from using any data provided during the evaluation procedure.

In the case of an assessment carried out in the name of an institution, the researcher must respect the terms of the national charter on scientific expert reports and the specific version of this which applies to their institution.

6. Collaborative work and plurality of activities

Collaborative work, particularly outside the institution and internationally, shall be subject to prior agreements with the public or private partners and must preserve the independence of the researcher, notably concerning the provision and use of data, their intellectual property rights and communication. Such work is covered by the same ethical rules, with a responsibility to ensure integrity, transparency and honesty.

Should the advisory or evaluation activities be carried out in conjunction with or peripheral to the research work, researchers are required to inform their employer and to comply with their institution's rules concerning plurality of activities and remuneration. Any interests which may arise from such work must be declared in any communication.

7. Training

Ethical rules must be integrated into educational curricula, particularly those for Master and PhD degrees, and learning them should be considered an integral part of mastering the specific domain of research.

