



A European Code of Conduct for Research Integrity

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1. Preface

The present Code of Conduct has resulted from a series of discussions within the European Science Foundation (ESF) Member Forum, and especially within Working Group 2 (focussing on 'Code of Conduct'); the Standing Committee on Science and Ethics of All European Academies (ALLEA); and a meeting of representatives of ALLEA's member Academies (Berne, 29/30-06-09). The discussions were based on various drafts of a discussion paper¹, which had been distributed both within the WG 2 and ALLEA.

The Working Group 2 was one of the four working groups established within the ESF Member Forum on Research Integrity, which resulted from the ESF-CSIC² workshop 'From principles to practice' in Madrid, 17-18 Nov. 2008. The objectives of the Member Forum were among others to serve as a platform for the exchange of information on attempts and initiatives to ensure research integrity and to prevent misconduct, and to encourage organisations which do not yet have appropriate structures to initiate debates in their respective communities on adequate models.

The four working groups and their commissions are:

- WG 1 'Raising awareness and sharing information' (chair: Sonia Ftacnikova (SL)),
- WG 2 'Code of Conduct' (chair: Pieter Drenth (NL)³; WG 2 was requested to devise and formulate a (European) Code of Conduct),
- WG 3 'Setting up national structures' (chair: Maura Hiney (IE)),
- WG 4 'Research on scientific integrity' (chair: Livia Puljak (HR)).

The four working groups work in collaboration and will integrate their insights and conclusions in a comprehensive strategy for promoting and safeguarding integrity in scientific and scholarly research and practice nationally and in the wider European context.

This Code of Conduct has met with the general approval of the European national Academies as well as within the ESF Member Forum. In the attempt to bring Academies in line and to reach an agreement on a Code of Conduct regarding research integrity ALLEA has taken up the gauntlet formulated in the ESF briefing on *Good scientific practice in research and scholarship*⁴, in which the following was suggested (art. 60): "National academies are well placed to provide leadership in the pursuit of scientific integrity and good practice. They are often the most appropriate independent body to establish and support a national committee for scientific ethics and to nominate independent experts on panels to investigating cases of alleged misconduct. Those academies that employ scientists have an added responsibility of formulating and managing their own guidelines and codes of practice".

An analysis has been made of a large number of existing national and international codes, ethical guidelines and regulations with respect to scientific and research integrity, as produced by academies,

¹ P.J.D.Drenth (2009), *Science and Integrity*, discussion paper, Amsterdam: ALLEA, and P.J.D.Drenth (2009), *Scientific Integrity: Code of Conduct*, discussion paper Amsterdam: ALLEA.

² The Spanish National Research Council.

³ For information on the other members of the WG 2 see Appendix III.

⁴ European Science Foundation (2000), *Good scientific practice in research and scholarship*. ESF briefing, Dec. 2000.

research foundations and other organisations around the world concerned with the scientific and ethical quality of research. In particular the US ORI publication *Introduction to the responsible conduct of research*⁵, the OECD-report on *Best practices for ensuring scientific integrity and preventing misconduct*⁶, and the text of an advice of the Co-ordinating committee for facilitating international misconduct investigations to the Global Science Forum of the OECD (submitted to the 20th meeting of the GSF, Feb. 2009) have lent support to the propositions developed in this paper. Moreover, the thoughts expressed in this paper are consistent with both ALLEA's *Memorandum on Scientific Integrity*⁷, and the European Commission's *Ethics for Researchers*⁸.

In many academies, universities and funding organisations some Code or Guidelines for research integrity and good research practices are already in effect. It is not the intention to replace these with the Code presented here. We expect these Codes or Guidelines rather to be in line with the latter. In some cases some additions or adjustments on the basis of the present proposal may be considered. However, in countries where such a Code does not yet exist or is still being developed this new Code may have a stimulating or steering effect. This document represents an agreement on a set of principles and priorities at a given point in time: changing national or institutional frameworks or scientific and technological developments may make some regular adjustments necessary.

Naturally the confinement to a European agreement on a Code of Conduct does not imply that these principles and guidelines are to remain restricted to the European scientific community. Hopefully they will be a step towards a globally accepted Code to be conceived by world science organisations such as IAP (the International Academy Panel), or the International Council for Science (ICSU)⁹. The objective of this proposed Code is to stimulate and develop the emergence of institutional settings that strengthen scientific integrity, and to set standards across Europe that can, eventually, be held valid and implemented world wide.

This Code of Conduct is not a body of law. It is not intended to have a legal character, but rather to be a canon for self regulation. It is a basic responsibility of the scientific community to formulate the principles and virtues of scientific and scholarly research, to define its criteria for proper research behaviour, and to set its own house in order when scientific integrity is threatened.

It is generally acknowledged that science as the process of knowledge augmentation is embedded in a wider socio-ethical context, and that scientists have to be aware of their specific responsibility towards society and the welfare of mankind. They bear responsibility for the choice of subjects to be investigated and its consequences, for proper care and treatment concerning the objects of research, and attention and concern with respect to practical applications and use of their research results. In this Code, however, we confine ourselves to standards of integrity while *conducting* research, and do not consider this wider socio-ethical responsibility.

⁵ N.H.Steneck (2004, rev. ed.), *Introduction to the responsible conduct of research*. Washington: US Office of Research Integrity.

⁶ OECD (2008), *Best practices for ensuring scientific integrity and preventing misconduct*, www.oecd.org/sti/gsf.

⁷ ALLEA (2003), *Memorandum on Scientific Integrity*. Amsterdam: ALLEA.

⁸ European Commission (2007), *Ethics for Researchers*. Brussels: EC.

⁹ A first step towards such globalisation may be the planned discussion of this proposal at the 2nd World Conference on Research Integrity in Singapore, July 21-23, 2010.

2. Code of Conduct

Science, including natural and social sciences as well as humanities, is the systematised knowledge obtained through observation and experimentation, study and thinking. Scientific research is carried out to determine the nature and principles of what is being studied. In spite of their differences in content and methods all sciences have a common characteristic: they depend on arguments and evidence, i.e. observations of nature or of humans and their actions and products.

Researchers, research institutes, universities, academies and funding organisations commit themselves to observe and to promote the *principles* of scientific integrity. These include: honesty in reporting and communicating, reliability in performing research, objectivity, impartiality and independence, openness and accessibility, duty of care, fairness in providing references and giving credits, and responsibility for future science generations. Research institutes, funding organisations, academies and other actors in the field of scientific research have to adhere to appropriate standards for data management and preservation of records and data and to high ethical standards in dealing with research participants.

Research employers (universities, institutes and other research performing organisations) also have a responsibility to ensure that a *culture of research integrity* prevails. This includes clear policies and procedures, training and mentoring of researchers at all stages of their careers, and robust management procedures to ensure that high standards are observed and any transgression is identified at an early stage.

Fabrication and falsification, including misrepresentation and deliberately omitting unwelcome facts or data, are among the most serious *violations* of the ethos of science. Also plagiarism is an unacceptable form of misbehaviour, and a violation against other researchers.

Institutes or organisations that fail to *deal* properly with such wrongdoing are also guilty of dereliction of duty. All allegations should be properly assessed, and credible allegations should be investigated fully, with corrective actions taken if allegations are confirmed.

Minor misdemeanours, reflecting only poor performance by researchers as opposed to serious misconduct – some adjustment or selecting of data or ‘adaptation’ of a figure - may not give cause to a formal charge. Minor misdemeanours by students or junior researchers should however always be reprimanded and corrected by teachers or mentors. Minor misdemeanours by more experienced researchers that leads to misrepresentation may be treated more seriously, and if repeated should be considered as misconduct.

In addition to the violation of the fundamental principles of responsible science many other forms of poor and inappropriate *practices* in science research deserve attention. These include poor data practices and inadequate data management, inappropriate research procedures, including questionable procedures for obtaining informed consent, insufficient respect and care for participants in the research, improper research design and carelessness in observation and analysis, unsuitable authorship or publishing practices, and reviewing and editorial derelictions. Some of these are very serious and discreditable, e.g. abuse of ethical requirements and of trust in relation to the public, research subjects or other participants in the research. However, unlike the fundamental principles of scientific integrity and the violation thereof, which have a *universal* character, such practices may be subject to different national traditions, legislative regulations or institutional provisions. A required system of regulations of good practice in

research should, therefore, (except for gross violations of ethical principles or the law) not be part of a universal *Code of Conduct*, but should be developed in the form of national *Good Practice Rules*, that would recognise the legitimate differences between national or institutional systems. The enclosed list of recommendations should be used as a guideline for the formulation of such national *Good Practice Rules*.

Investigations of research misconduct allegations should be consistent with national laws of the country in which the investigations are conducted. What is required is a due and fair process, that is uniform and sufficiently rapid, and leads to proper outcomes and sanctions. The investigations must be carried out in accordance with the highest standards of process integrity, uniformity within one domain of jurisdiction, and fairness to all parties. Confidentiality should be observed as much as possible, unnecessary detriment to reputations should be avoided, and a proportionate action should be taken against persons found to have committed research misconduct. Wherever possible precaution should be taken to ensure that investigations are carried through to a conclusion. They should not cease, leaving questions unresolved, merely because the defaulter has left the institution.

In *international collaboration* partners should agree to conduct their research according to the same standards of research integrity, and to bring any suspected deviation from these standards, in particular alleged research misconduct, to the immediate attention of the project leader(s) (and of the senior responsible officer in the university or institute (employer)), in order for it to be investigated according to the policies and procedures of the partner with the primary responsibility, while respecting the laws and sovereignty of the States of all participating parties. In large scale, funded international projects the promotion of good practice and the handling of possible cases of misconduct, as recommended by the co-ordinating committee of the OECD Global Science Forum, should be followed. The boiler plate text, recommended by this committee, should be embodied in the formal documents that establish the collaborative project.

3. Background and elucidation

In this section a more extensive elucidation of the somewhat condensed Code of Conduct, presented above, is given. The nature of science and scholarship, the values to be fostered in scientific and scholarly research, the various discreditable forms of misconduct will be discussed, and procedures for dealing with allegations of misconduct and rules for good research practice will be recommended.

3.1. *Nature of science and scholarship.*

In a broad sense *science* (in Latin *scientia* is knowledge) is the systematised knowledge obtained through observation and experimentation, study and thinking. It is rooted in human curiosity, the wish to understand the physical, biological and social worlds as well as the human mind and its products. Science aims at deepening our understanding and extending our knowledge beyond what is already known. The term 'science' is normally applied only to the natural and social sciences; in this document it will be applied in a broader sense, like the German word 'Wissenschaft', which applies also to the humanities. Of course, there are differences between the various disciplines, sometimes even indicated as 'cultural'¹⁰, but in this discussion emphasis will be laid on the communalities rather than the disparities between the disciplines.

¹⁰ C.P.Snow (1959), *The Rede lecture*. Cambridge: Cambridge University Press.

W.Leppenies (1985), *Die drei Kulturen; Sociologie zwischen Literatur und Wissenschaft*. München: Hanser.

Scientific *research* is carried out in order to determine the nature and principles of what is being studied. Such research is diverse and multifaceted and cannot be captured in a single factual and normative description. However, although they may differ in methods and traditions, all sciences have a fundamental characteristic in common: they depend on argument and evidence, i.e. observations of nature, or of humans and their actions and products.

Science is not an enterprise carried out in isolation. Research cannot be done without drawing upon the work of other scientists and scholars; and in most cases it requires collaborating with others (cf Merton's¹¹ communalism). And this collaboration assumes ever more an international character. It is also the scientific community that determines appropriate methods of research and the validation of findings. The contribution of scientific research to the extension of human knowledge can, therefore, only take place if its results are presented to others in such a way that they can judge their validity (Merton's organised scepticism).

There is another connection with the outside world. Not only do social and political forces affect the directions of research, science itself also affects greatly societal developments. The impact of science, now extending to nearly all fields of knowledge and its applications, has contributed immensely to society, even though its results can be and have been misused at times. It is the responsibility of scientists and researchers to do what they can to ensure that research is for the universal well being of mankind and the good of society.

Coercion of powerful persons or institutions, religious or political pressure, economic or financial interests can corrupt science. Science should, therefore, be as 'disinterested' and independent as possible and always impartial, and should have the freedom to adhere to its own laws and criteria. At the same time we have to acknowledge that scientists operate in a value-bound context. Their paradigmatic presumptions, their choice of subjects to be studied, the way they collect their data, the impact of their discoveries on the society all refer to the ethical and social context in which science proceeds.

3.2. Science and ethics

The ethical/social values and conditions referred to in the previous section accentuate again the ethical and social responsibility of the scientist. A distinction should be made between two categories of issues: problems related to science and society, emphasising the socio-ethical *context* of research, and problems related to scientific integrity, emphasising standards when *conducting* research. There is, of course, no perfect watershed between the two categories. Some forms of misconduct may have serious consequences for the health or wellbeing of citizens, and can, therefore, be seen as unethical in the broader sense of the word, but in the light of a discussion on a Code of Conduct the distinction may be clarifying.

Many ethical questions arise when science is regarded in a wider ethical/social context. Is the subject worthy of investigation? What are the consequences of such research? Could the research result in harm for people, nature or society, or be in conflict with basic human values? Is the research sufficiently independent of interested parties? Could a university or laboratory become too dependent on sponsored contract research? Could the researcher guard against the improper or selective use and misinterpretation of their findings, or against objectionable applications of their discoveries?

¹¹ Merton, R.K.(1973). *The sociology of science: theoretical and empirical investigations*. Chicago: Cambridge University Press. The other three Mertonian norms of science are universalism, disinterestedness and organised scepticism.

This document will not deal with this wider ethical *context* of science, but focus on the second category, the responsible *conduct* of research¹².

3.3. Integrity in science and scholarship: principles

Both the definition of scientific misconduct and the specification for proper scientific practice are based upon principles of scientific integrity. These are principles that all scientific and scholar+ly researchers and practitioners should observe individually, among each other and toward the outside world. These principles include the following:

- *Honesty* in presenting research goals and intentions, in precise and nuanced reporting on research methods and procedures, and in conveying valid interpretations and justifiable claims with respect to possible applications of research results.
- *Reliability* in performing research (meticulous, careful and attentive to detail), and in communication of the results (fair and full and unbiased reporting).
- *Objectivity*: interpretations and conclusions must be founded on facts and data capable of proof and secondary review; there should be transparency in the collection, analysis and interpretation of data, and verifiability of the scientific reasoning.
- *Impartiality* and *independence* from commissioning or interested parties, from ideological or political pressure groups, and from economic or financial interests.
- *Open communication*, in discussing the work with other scientists, in contributing to public knowledge through publication of the findings, in honest communication to the general public. This openness presupposes a proper storage and availability of data, and accessibility for interested colleagues.
- *Duty of care* for participants in and the subjects of research, be they human beings, animals, the environment or cultural objects. Research on human subjects and animals should always rest on the principles of respect and duty of care.
- *Fairness*, in providing proper references and giving due credits to the work of others, in treating colleagues with integrity and honesty,
- *Responsibility for future science generations*. The education of young scientists and scholars requires binding standards for mentorship and supervision.

3.4. Integrity in science and scholarship: misconduct

Violating these basic norms leads to research misconduct, which is the crux of inappropriate behaviour in science. Research misconduct is damaging to *science*, because it may create false leads for other scientists or the results may not be replicable, resulting in a continuation of the deception. It is also harmful to *individuals* and *society*: fraudulent research may result in the release and use of unsafe drugs, in the production of deficient products, inadequate instruments or erroneous procedures. Furthermore, if policy or legislation is based on the results of fraudulent research, harmful consequences are not inconceivable. But damage is also done through the subversion of the public's *trust in science*. The credibility of science would decline and trust in science as a dependable source of information and advice in respect of numerous decisions, so important for the welfare of mankind and society (environment, health, security, energy), would be subverted. This could lead to undesirable restrictions on permissible research, which could further damage the pursuit of knowledge.

There is some empirical evidence¹³ that there is an increasing incidence of research misconduct. Pressure to publish, commercialisation, greater competition for funds, more opportunities for instance

¹² As was requested at the establishment of the ESF Member Forum on Research Integrity (Madrid, 2008), and reiterated at the first meeting of the Chairs of the four working groups (Amsterdam, 2009).

through the internet, evaluation practices, and the current career system for scientists, may all contribute to this unfortunate development.

The two most serious violations of the ethos of science are fabrication and falsification. *Fabrication* is making up results and recording or reporting them. *Falsification* is manipulating research processes or changing or omitting data. Fabrication and falsification can also arise in the reporting of other researcher's results, in the reporting of expert opinion and in the public dissemination of science. A third category of misdemeanour is plagiarism in proposing, performing, or reviewing research, or in reporting research results. *Plagiarism* is the appropriation of another person's ideas, research results or words without giving appropriate credit. The precise wording of an idea or explanation or illustrative material (such as original figures and photographs, as well as lengthy tables) in textbooks or popular material are protected by copyright laws, but nevertheless can be subject to plagiarism. Plagiarism is of a different order since it is supposed to be more injurious to fellow scientists than to science as such. However, we have seen that openness is one of the basic integrity principles, and that progress in science depends on communication and discussion among fellow scientists and on a well functioning peer-review system. And if scientists would hesitate or even refuse to practice this openness and communication for fear of not being recognised as deviser or author the quality of science would suffer as well.

Also *improper dealing* with such infringement of principles of integrity (attempts to cover up, reprisals to whistle-blowers and violations of due process) can be classified as misconduct. In general it should be underlined that research institutes, funders, academies, universities and other actors conducting and administering research have the duty to promote good research management so that research integrity is instilled into the culture.

It is generally accepted that the primary responsibility for handling cases of misconduct is in the hands of the employers of scientists doing research. Frequently this concerns the institute or university where the accused researcher works. These institutions should have a standing committee that deals with misconduct, or establish an ad hoc committee in case a serious allegation is brought forward.

Furthermore, there is a general consensus on the need for a due and fair process, that is uniform and sufficiently rapid, and leads to proper outcomes and sanctions. A co-ordinating committee for facilitating international research misconduct investigations of the OECD¹⁴ has formulated a number of overarching principles for investigating research misconduct in international collaborative projects, that can be adopted for general application. Annex I contains recommended principles that follow the main lines of the OECD recommendations.

Responses will depend on the seriousness of the research misconduct. In this respect the level of intent of the misconduct, the consequences of the behaviour, and other aggravating and mitigating factors should be considered. It has to be shown that the misconduct was committed intentionally, knowingly, or recklessly. As standard proof for the culpability of a suspected researcher 'preponderance of evidence' should be applied. It should be stipulated that research misconduct does not include honest errors or differences in opinion.

It should be recognised that the demarcation line between unacceptable and still acceptable behaviour is not always clear and beyond academic debate. Where does one draw the line between verification on

¹³ Reported by N. Steneck at the EFS-ORI first World Conference on Research Integrity, *Fostering Responsible Research*. Lisbon, Portugal, 16-19 Sept., 2007. The same increase of misconduct was generally observed by European Academy Presidents in a survey conducted in 2007, and reported by P.J.D.Drenth (*Strengths and weaknesses of current policies and practices*) at the same Lisbon conference.

¹⁴ Referred to in the preface of this document.

a too small sample and the illustration of an argument with 'case' data? Where is the boundary between plagiarism and careless citation? Was an incorrect, but 'favourable' statistical technique truly chosen deliberately? Was a biased selection of data meant to start a scientific discussion or intended to present a full review of the evidence?

In the literature another class of misconduct is discussed, the 'questionable research practices' (QRP). Three groups of misbehaviour fall within QRP: Firstly: personal misconduct: intimidation of students, harassment, discrimination, insensitivity to social or cultural norms in doing research, misuse of funds, etc. Although we deal with undesirable and, at times, unacceptable conduct here it is not 'scientific misconduct', since it does not affect the integrity of the research record. Much of this misbehaviour is subject to generally applicable legal and social penalties that apply to everyone.

Secondly: a varied group of bad research practices, such as bad data management, incorrect research procedures, or some publication related misconduct. Bad practices are not acceptable and often harmful to the public's trust in science. They need correction indeed, but are not necessarily basic infringements of scientific integrity. The next section will deal with this category.

In the third place minor misdemeanours that may not lead to formal allegations and investigations, but are just as damaging given their probable frequency: some 'adjustment' of data, cutting a corner, omitting an unwelcome observation ... It should be clear that here we deal with unacceptable violations of the principles of scientific integrity: it is falsification *in statu nascendi*. If it occurs with students or junior scientists, it should be corrected through proper supervision and mentorship. With more experienced researchers, especially if seen to be repeated, it should be treated more seriously.

It should be emphasised that the principles discussed in the previous section and the infringements defined in this section refer to *fundamental* and *universal* norms for responsible conduct in research. There is no need for cultural or regional adaptations or compromises in a Code of Conduct that encompasses these principles and infringements.

3.5. Good practices

In addition to fabrication, falsification and plagiarism many other forms of objectionable practices in scientific research deserve attention. Some of them have serious moral or legal consequences, others may create nuisance, discontent or procedural dissension. Many of them may undermine public trust in science same as basic infringements of scientific integrity, and should therefore be taken seriously by the scientific community. The following categories may be distinguished:

- (1) *Data practices*, including data management and storage, placing data at the disposal of colleagues who want to replicate the findings, adequate preservation of original data.
- (2) *Research procedures*. Deviations from desired practices include insufficient care for research subjects¹⁵, insufficient respect to human subjects, animals, the environment, or cultural heritage; violation of protocols; failure to obtain informed consent; insufficient privacy protection; improper use of laboratory animals; or breach of trust (e.g. confidentiality). Improper research design, carelessness in experimentation and calculations that lead to gross errors, may also be classified under this heading, although the partition-wall between incompetence and dishonesty may be rather thin here.
- (3) *Publication-related* conduct, including authorship practices. It is unacceptable to claim or grant undeserved authorship and to deny deserved authorship, or to inadequately allocate credit. Breaching of publishing rules, such as repeated publication, salami-slicing of publication, no or

¹⁵ The treatment of human subjects in research is in many countries regulated by law.

a too long delay in publication, or insufficient acknowledgement of contributors or sponsors, fall within this category as well.

- (4) *Reviewing* and *editorial* issues, including independence and conflict of interests, personal bias and rivalry, appropriation of ideas.¹⁶

Again, the dividing line between acceptable and not acceptable practices is somewhat vague, and may vary over nations, regions or disciplines. But there is also a thin borderline between some violations of these practices and the serious types of misconduct, as discussed in section 3. 3.4. Unjustified claimed authorship and ghost authorship are forms of falsification, purloining ideas as an editor or reviewer is plagiarism, causing pain or stress to research participants or to expose them to hazards without informed consent is certainly ethically unacceptable behaviour. But in general these 'good practices' refer to practical rules and arrangements in conducting, administering and reporting research.

Unlike the fundamental principles of scientific integrity and the violating of these principles through fabrication, falsification or plagiarism, which have a universal character, good practices as outlined above may be subject to cultural differences: definitions, traditions, legislative regulations and institutional provisions may vary over nations or regions, sometimes also over disciplines. A required system of regulations of good practices in research should, therefore, not be part of a universal Code of Conduct. It should rather be developed in the form of national or institutional *Good Practice Rules*, recognising the legitimate differences between national, disciplinary or institutional systems. Nevertheless a list of issues to be addressed in such Rules (see sub 3.4 below) should be provided, including recommendations on how to deal with them. In general such recommendations are based on general assent, but, as said, rules of procedure must allow for national differences and cannot claim catholicity.

4 Guidelines for Good Practice Rules

In these guidelines the following categories of good practices in scientific and scholarly research are distinguished: proper data practices, proper (technical as well as responsible) research procedures, well-considered publication-related conduct and responsible reviewing and editorial procedures.

Each country should adopt, amend or supplement these recommendations in accordance with its legislative requirements or traditions and compose an own set of Good Practice Rules. Then the scientific society will require all its members to adhere to these Rules, and will also ask its institutes and scientific organisations to require their own members to comply.

1. *Good data practices: availability and access*

- All primary and secondary data should be stored in a secure and accessible form.
- Original scientific or scholarly research data should be documented and archived for a substantial period (at least 5 years, and preferably 10 years).
- Research data should be placed at the disposal of colleagues who want to replicate the study or elaborate on its findings.
- Freedom of movement of scientists, the right to peaceably and voluntarily associate with other scientists, and the freedom of expression and communication should be guaranteed.

¹⁶ A number of suggestions with respect to headings 3 and 4 in the Rules of Procedure are extracted from the excellent publication of the Committee on Publication Ethics (COPE) *Guidelines on good publication practice*. We are also grateful for the Committee's comments on an earlier version of this proposal.

2. *Proper research procedures*

- All research should be designed and carried out in a careful and well considered manner; negligence, haste, carelessness, and inattention should be avoided, so as to prevent human errors.
- Researchers should try to deliver what has been promised in the application for support or funding.
- Researchers must seek to minify any harmful impact on the environment, and should be aware of the need for sustainable management of resources; this implies an efficient deployment of the (financial and other) resources, and minimisation of waste.
- Clients and/or sponsors should be alerted to the ethical and legal obligations of the researcher, and to the possible restrictions this may imply.
- Clients and/or sponsors should be made aware of the vital importance of publication of the research findings.
- Confidentiality of data or findings should be respected by the researcher when it is legitimately required by the client or employer.
- Proper account will be given to the sponsor in case a grant or co-funding was received for the research.

3. *Responsible research procedures*

- All research subjects, be they human, animal, cultural, biological, environmental or physical, should be handled with respect and care.
- The health, safety or welfare of the community, or of collaborators and others connected with the research, should not be compromised.
- Sensitivity to age, gender, culture, religion, ethnic origin and social class of research subjects should be evinced.
- Human subject protocols should not be violated: this implies complying with the requirement of informed consent on the basis of adequate and appropriate information, and to voluntary agreement to participate, treating personal information with highest possible confidentiality, avoiding unnecessary deception, and using the obtained information only for the purpose of the investigation.
- The use of animals in research is acceptable only if alternative ways to achieve the results have been investigated and have been found inadequate; any harm or distress to be inflicted on an animal must be outweighed by the realistic expected benefits and must be minimised as much as possible.

4. *Publication-related conduct*

- Researchers should publish the results and interpretations of their research in an open, honest, transparent and accurate manner.
- Researchers should strive to ensure the earliest possible publication of the results of their research, unless commercial or intellectual property considerations (e.g. patent application) justify delay.
- Authorship should only be based on a creative and significant contribution to the research (i.e. contribution to the design, data collection, data analysis, or reporting, not for general supervision of a research group or editing of text). Guest authorship (i.e. listing authors who do not qualify) or ghost authorship (i.e. omitting individuals who meet authorship criteria) are not acceptable. All authors are fully responsible for the content of the publication, unless it is specified they are responsible only for a specific part of the study and publication.

- Sequence of authors should be agreed by all authors, ideally at the start of the project or the initiation of the article/monograph, and may follow national and/or disciplinary codes. The criteria for deciding the order of authors should be agreed at the start of the project or writing.
- The work and contribution of collaborators and assistants should be acknowledged if appropriate, with their permission.
- All authors should declare any relevant conflict of interest, which may be financial, commercial, personal, academic, or political.
- Important work and intellectual contributions of others that have influenced the reported research should be appropriately acknowledged. Related work should be correctly cited. References should be restricted to (paper or electronically) printed publications and publications 'in print'.
- In communication with the general public and in popular media the same standards of honesty and accuracy should be maintained; any attempt to exaggerate the importance and practical applicability of the findings should be resisted.
- Publication of the same (or substantial parts of the same) work in different journals is acceptable only with the consent of the editors of the journals and where proper reference is made to the first publication. In the author's CV such related articles must be mentioned as one item.
- Financial or other types of support for the research and its publication should be properly mentioned and acknowledged.

5. *Reviewing and editorial issues.*

- An editor or reviewer who has a relevant potential conflict of interest - which may be personal, academic, political, commercial or financial - should, ideally, withdraw from involvement in any publication decision. If the conflict is considered minor or unavoidable it should be disclosed to the readership.
- Reviewers should provide thorough, accurate, objective, and justifiable assessments in a timely manner.
- In the review of a manuscript, confidentiality must be maintained.
- Reviewers and editors shall not make any use of the data or interpretations presented in submitted manuscripts without the author's permission.
- The same standards and rules apply in the review process with regard to projects or programmes submitted for funding, rewards or reconnaissance purposes.
- The same standards and rules apply in the review process of individuals or institutions for appointments, promotion, awards or other forms of recognition.

5 International collaborative research

International scientific collaboration is increasing sharply, not only because of the growth of international funding and the stimulation of modern communication technology, but also because science itself has developed into a truly collaborative and international activity. Common agreement on standards of scientific integrity, and on rules and procedures to deal with cases of misconduct, is of crucial importance in international research as well. This is the main argument for an internationally accepted Code of Conduct.

In international collaboration partners should agree to conduct their research according to the standards of research integrity as developed in this document, and to bring any suspected deviation from these standards, in particular alleged research misconduct, to the immediate attention of the project leader(s) and senior responsible officer in the university or research institute (employer). Such a case should be

investigated according to the policies and procedures of the partner with the primary responsibility for the project, while respecting the laws and sovereignty of the States of all participating parties.

In formal, large scale, and often externally funded international research projects there may be questions as to which country should conduct the investigation if allegations of misconduct are raised, and how; and, even more importantly, what is to happen when the relevant national policies are at odds with each other. The Co-ordinating Committee of the OECD Global Science Forum, referred to sub 3.3.5, recommends the establishment of an agreement for collaborative research that addresses the promotion of responsible conduct in research and describes the procedures for the investigation of allegations of research misconduct within the project. The Committee has produced a boilerplate text for International Agreements, which should be embodied in the formal documents that establish the collaborative project. This boilerplate text is included under Annex II

ANNEX I:*Recommended Principles for Investigating Research Misconduct**Integrity of the process*

- Investigations into research misconduct allegations must be fair, comprehensive and conducted expediently but without compromising accuracy, objectivity, and thoroughness.
- Those parties involved in the procedure must ensure that any interests they have which might constitute a conflict of interest are disclosed and managed.
- Detailed and confidential records will be maintained on all aspects of the procedure.

Uniformity

- Procedures for dealing with misconduct should be spelled out in sufficient detail so that the transparency of the process and uniformity within one domain of jurisdiction from one case to another is ensured.

Fairness

- Investigation of research misconduct allegations should be conducted in a manner that is fair to all parties and in accordance with relevant laws.
- Persons accused of research misconduct must be given full details of the allegation(s) in writing and allowed a fair process for responding to allegations, asking questions, presenting evidence, calling witnesses, and providing responses to information presented.
- Allow witnesses to be accompanied by or seek advice and assistance from anyone of their choosing.
- Proportionate action should be taken against persons found to have committed research misconduct.
- Any action(s) taken should be subject to appeal. Of course, there should be an authority issuing the final decision

Confidentiality

- The procedure should be conducted as confidentially as possible, in order to protect those involved in the investigation. Such confidentiality should be maintained provided this does not compromise the investigation of the allegation, health and safety, or the safety of participants in research.
- Where possible any disclosure to third parties should be made on a confidential basis.
- If the organization and/or its staff have legal obligations to inform third parties of research misconduct allegations, those obligations must be fulfilled at the appropriate time through the correct mechanisms.

No Detriment

- Anyone accused of research misconduct is presumed innocent.
- No person should suffer any unnecessary penalty when accused of research misconduct before the allegation is proven.
- No person should suffer any penalty for making an allegation of research misconduct *in good faith*, but action should be taken against persons found to have made allegations in bad faith.

Annex II

Boilerplate text for International Agreements, as suggested by the OECD Global Science Forum Co-ordinating Committee for facilitating international misconduct investigations.

We, the parties, agree:

- to conduct our research according to the standards of research integrity, as defined in the “Guidance Notes for Developing Procedures to Investigate Research Misconduct Allegations in International Collaborative Research Project” (www.oecd.org/sti/gsf) and other appropriate documents, including: (*specify the national codes of conduct and disciplinary or national ethical guidelines that apply*);
- that any suspected deviation from these standards, in particular alleged research misconduct, will be brought to the immediate attention of (*all designated contact point(s)*) and investigated according to the policies and procedures of (*to be filled in with the body with primary responsibility*), while respecting the laws and sovereignty of the States of all participating parties;
- to cooperate in and support any such investigations; and
- to accept (subject to any appeal process) the conclusions of any such investigation and to take appropriate actions.

Annex III: Members of the Working Group

Member	Organisation	Country
Pieter Drenth (chair)	All European Academies (ALLEA)	NL
Tommy Dahlen	Swedish Council of work life and social research	SE
Glyn Davies	Economic and Social Research Council (ESRC)	UK
Kirsten Hüttemann	Deutsche Forschungsgemeinschaft (DFG)	GE
Pavel Kratochvil	Academy of Sciences of the Czech Republic	CZ
Michelle Hadchouel	Institute Nationale de la Santé et de la recherche Medicale (INSERM)	FR
Pere Puigdomènech	Consejo Superior de Investigaciones Cientificas (CSIC)	SP