The term ‘good scientific practice’ represents the standards that apply to scientific activities. These standards are continuously being developed within the individual sciences. Good scientific practice are discussed internationally under the headings "research integrity", "scientific integrity", "good scientific practice", “Good Research Practices (GRP), "responsible conduct of research (RCR)" and "research ethics of science".

The present document provides a guide for good research conduct in submitting and executing FNR-funded research projects and aims to help preventing misconduct.
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1. PRINCIPLES OF RESEARCH INTEGRITY

The FNR subscribes to the principles laid out in the revised edition of The European Code of Conduct for Research Integrity (ALLEA), that serves the European research community as a framework for self-regulation across all scientific and scholarly disciplines and for all research settings:

“Good research practices are based on fundamental principles of research integrity. They guide researchers in their work as well as in their engagement with the practical, ethical and intellectual challenges inherent in research.”

These principles are:

- **Reliability** in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources.
- **Honesty** in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way.
- **Respect** for colleagues, research participants, society, ecosystems, cultural heritage and the environment.
- **Accountability** for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts.

The FNR also adheres to the principles which are laid out in the Singapore Statement on Research Integrity.

Host Institutions are expected to have in place clear ethical guidelines and good practice procedures designed to manage FNR-funded research under their responsibility. These guidelines and procedures shall deal with the following issues, among others:

- “Good data practices”: availability and access
- “Proper research procedures”
- “Responsibility”: all research subjects should be handed with respect
- “Publication-related conduct”
- “Reviewing and editorial issues”
2. GOOD SCIENTIFIC PRACTICE WITHIN THE FNR FUNDING PROCESS (APPLICATION FOR FUNDING AND/OR REPORTING)

FNR applicants need to make sure that they respect any ethical and legal obligations when submitting proposals to the FNR. Applicants have to describe ethical issues and appropriate research conduct procedures, and show that these issues will be handled appropriately once the project starts. The applicants must take into account in a realistic manner the duration of processing of all necessary authorisations into their work plan. On a practical level, FNR refers applicants to the checklist published by the UK Research Integrity Office highlighting the key points of good conduct in research projects and strongly suggests that these points have been considered before submitting a proposal to the FNR and embarking on a research project. Furthermore, given the fact that many of the FNR supported projects are of a collaborative nature involving project partners of different nations, the Montreal Statement on Research Integrity in Cross-Boundary Research Collaborations is provided in annexe.

Main topics to be addressed in the submission process:

Acknowledgement of contributions
The FNR recognises that project proposals may be authored by several scientists. The contributions of each member of the team should be stated in the proposal where appropriate.

Correct referencing
When referring to the work of other scientists in an FNR proposal, appropriate, accurate and verifiable reference to the original source must always be given. This must be done in a manner that makes it clear to which text passage it refers. Every source that is used must always be acknowledged; whether it is paraphrased, summarized, or enclosed in quotations. Paraphrasing and/or summarizing others’ work necessitate(s) reproducing the exact meaning of the other author’s ideas or facts using your own words and sentence structure. Verbatim copied text passages from other sources should be used sparsely and where paraphrasing may be unsuitable. These text passages must be marked appropriately; a clear distinction from the main proposal text has to be provided e.g. text passage inserted between quotation marks, italics or cursive. When in doubt as to whether a concept or fact is common knowledge, a citation shall be provided.

The use of descriptive text passages from the authors’ own past publications, so called self-citations, is acceptable provided that it is restricted to short paragraphs and due reference is given. The reuse of text passages from one’s own previously unsuccessful proposals is acceptable.
Parallel submissions of project ideas
The FNR also recognises that similar project ideas may be submitted to several funding agencies or to several FNR funding streams. The FNR allows for this provided that this fact is indicated within the proposal in the relevant section\(^1\). However it may not result in the double funding of the 'same project', which would be considered a serious breach of the rules of good scientific practice.

3. NATIONAL REGULATIONS CONCERNING ETHICAL ISSUES AND DATA PROTECTION

Research on Humans and/or involving human data and/or human materials
For research on human subjects, each of the protocols will need to be submitted for approval to the local ethical committee of the Institution. No trial, study or clinical experimentation can be practiced on human beings for the development of biological or medical knowledge without the Health Minister's authorization, after requesting the opinions of the Health Directorate (Direction de la Santé) and National Research Ethics Committee (Comité National d'Ethique de Recherche)\(^2\). The storage of bio-specimens also requires ethics clearance by the CNER.

For other broader questions raised in the field of bioethics, please refer to the National Consultative Ethics Committee for Health and Life Sciences (C.N.E.).

For all FNR supported projects carried out in an international framework the applicant must ensure that all partners have obtained approval from their local ethics committee.

In addition, the Beneficiary intending to undertake research on human subjects are advised to contact the Clinical and Epidemiological Investigation Center (CIEC) of the LIH, which provides support in setting up protocols and organises information and training days relating to clinical research.

In addition to these formal requirements the following general principles apply:

Informed consent: When describing issues relating to informed consent, it will be necessary to illustrate an appropriate level of ethical sensitivity, and to consider issues of insurance, incidental findings and the consequences of leaving the study. Consent forms must be written in lay language, not scientific/technical language.

Data protection issues: All FNR funded projects must comply with the EU’s General Data Protection Regulation (GDPR) 2016/679 and with chapter 2 of the Luxembourg law of the 1st August 2018\(^3\).

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\(^1\) Please be aware that other funding agencies may not allow this.
\(^2\) Article 27 of the 8th March 2018 law on hospitals
\(^3\) Loi du 1er août 2018 portant organisation de la Commission nationale pour la protection des données et mise en œuvre du règlement (UE) 2016/679 du Parlement européen et du Conseil du 27 avril 2016 relatif à la protection des personnes physiques à l’égard du traitement des données à caractère personnel et à la libre circulation de ces données, et abrogeant la directive 95/46/CE (règlement général sur la protection des données)
The unnecessary collection and use of personal data should be avoided. The source of the data should be identified, describing whether it is collected as part of the research or whether it was collected previously. Details on how personal identification of the data is protected should be provided. Data storage and data sharing must also be described. Use of animals

All animal experiments need to be conducted in accordance with national and EU legislation covering the use of animals in research (EU Directive 2010/63) and the European convention for the protection of vertebrate animals for experimental or other scientific purposes. Laboratories handling animals for research purposes and performing interventions on animals have to be accredited by the Ministry of Agriculture and the Ministry of Health in Luxembourg. In addition, the national legislation requires each of these institutions to have an Animal Welfare Structure (AWS) that provides ethical evaluation of all protocols and guidance to the researchers working with animals. Where animals are used in research, the application of the 3Rs (Replace, Reduce, Refine) must be convincingly addressed. Numbers of animals should be specified and a description of what happens to the animals after the research experiments needs to be given.

Researchers must successfully complete animal ethics training in accordance with the EU Directive 2010/63.

4. RESEARCH MISCONDUCT

Violating the above-mentioned basic norms and regulations leads to research misconduct, which is the crux of inappropriate behaviour in science. “The term ‘research misconduct’ embraces many things, including insufficient care for the people, animals or objects that are the subject of or participants in research; breaches of confidentiality, violation of protocols, carelessness of the kind that leads to gross error and improprieties of publication involving conflict of interest or appropriation of ideas. Many of these unacceptable research practices are addressed in the European Code of Conduct for Research Integrity” (OECD report on Best Practices for Ensuring Scientific Integrity and Preventing Misconduct).

At the core of the spectrum of inappropriate behaviours is “Research Misconduct”, consisting of Fabrication, Falsification and Plagiarism (FFP), as addressed in the revised ALLEA European Code of Conduct (section 3.1):

“3.1 Research Misconduct and other Unacceptable Practices Research misconduct is traditionally defined as fabrication, falsification, or plagiarism (the so-called FFP categorisation) in proposing, performing, or reviewing research, or in reporting research results:
• Fabrication is making up results and recording them as if they were real.
• Falsification is manipulating research materials, equipment or processes or changing, omitting or suppressing data or results without justification.
• Plagiarism is using other people’s work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs.

4 Accurate use of terms anonymous, anonymized, and coded is essential to describe and justify these details
These three forms of violation are considered particularly serious since they distort the research record. “

For the revised ALLEA European Code of Conduct

“There are further violations of good research practice that damage the integrity of the research process or of researchers. In addition to direct violations of the good research practices set out in this Code of Conduct, examples of other unacceptable practices include, but are not confined to:

• Manipulating authorship or denigrating the role of other researchers in publications.
• Re-publishing substantive parts of one’s own earlier publications, including translations, without duly acknowledging or citing the original (‘self-plagiarism’).
• Citing selectively to enhance own findings or to please editors, reviewers or colleagues.
• Withholding research results.
• Allowing funders/sponsors to jeopardise independence in the research process or reporting of results so as to introduce or promulgate bias.
• Expanding unnecessarily the bibliography of a study.
• Accusing a researcher of misconduct or other violations in a malicious way.
• Misrepresenting research achievements.
• Exaggerating the importance and practical applicability of findings. Delaying or inappropriately hampering the work of other researchers.
• Misusing seniority to encourage violations of research integrity.
• Ignoring putative violations of research integrity by others or covering up inappropriate responses to misconduct or other violations by institutions.
• Establishing or supporting journals that undermine the quality control of research (‘predatory journals’).

In their most serious forms, unacceptable practices are sanctionable, but at the very least every effort must be made to prevent, discourage and stop them through training, supervision and mentoring and through the development of a positive and supportive research environment. “

Research misconduct does not include honest error or honest differences of opinions. However “minor misdemeanours may not lead to formal investigations, but are just as damaging given their probable frequency, and should be corrected by teachers and mentors.”
5. PREVENTING AND DEALING WITH MISCONDUCT

The FNR embraces a two pronged approach in ensuring that FNR funded research is being conducted following the good practices described herein.

a. Prevention:

The FNR considers that information and guidance are key in order to avoid research misconduct to happen. Therefore the FNR includes a section on research misconduct in its information sessions on the respective instruments and makes the present guide on Research Integrity in the Framework of FNR Funding publically available. Furthermore, FNR expects that all eligible institutions have in place clear ethical guidelines and good practice procedures (including training for all researchers) designed to manage FNR-funded research under their responsibility. The FNR as well as the Luxembourgish Host Institutions provides Coaches to assist with questions about research ethics and research integrity relating to grant applications.

b. Deterrence/enforcement:

The FNR takes an active role in preventing research misconduct and has put in place mechanisms to detect and deal with suspected cases of misconduct committed by researchers applying for or benefitting from FNR funding. The FNR handles cases of research misconduct suspicions according to international best practices.

All alleged cases of research misconduct which are detected (during grant review and project monitoring, information by third parties, with the use of plagiarism detection software, etc.) will be investigated confidentially by the “Luxembourg Agency for Research Integrity” (LARI)

The mission of LARI is twofold: 1) To promote responsible conduct of research; 2) To ensure an independent inquiry and investigation in cases of alleged scientific misconduct. LARI, under Art. 7 of its Statutes, establishes a National Commission for Research Integrity (CRI). The CRI's mission is to ensure an independent inquiry and investigation in cases of suspected scientific misconduct. It provides FNR with recommendations on how to handle each case which are subsequently endorsed by the FNR. Confirmed research misconduct may result in rejection of projects, time bound exclusion from submitting projects to the FNR etc.
6. GLOSSARY

BEST PRACTICE: the processes, procedures, and methods that are ethically and legally accepted as appropriate for promoting research integrity. Best practice includes codes and guidelines for the design, conduct, recording, monitoring, auditing, analysis, and reporting of research.

Clinical and Epidemiological Investigation Center (CIEC) functions to assist and support clinical research projects in Luxembourg by providing logistical expertise to hospitals and physicians engaged in clinical trials.

Luxembourg Agency for Research Integrity (LARI) is the national agency promoting and investigating research integrity in Luxembourg. LARI intersects with a variety of research disciplines including medicine, behavioural and social sciences, physical sciences and mathematics, engineering and materials sciences, law, and computing.

National Commission for Data Protection (COMMISSION NATIONALE POUR LA PROTECTION DES DONNÉES – CNPD) is an independent authority governed by the Law of 1 August 2018 ensures the respect of personal freedoms and fundamental rights with regard to data protection and privacy.

National Consultative Ethics Committee for Health and Life Sciences (C.N.E.) - Commission Nationale d'Éthique, Luxembourg -was set up by the government in 1988. CNE has fifteen members including a chairman and a vice-president. The Committee’s primary mission is to produce opinions and reports on ethical problems and societal issues raised by progress in the fields of biology, medicine and health. http://www.cne.public.lu/commission/index.html »

National Research Ethics Committee (CNER): The main role of the National Research Ethics Committee (CNER) is to approve research projects involving human beings (clinical trials involving experimental drugs, therapies, medical devices, etc.). http://www.cner.lu/

Research Ethics aims to respect human autonomy, maximize benefits, minimize harms, and promote justice.

Research Integrity: Oxford Dictionary defines integrity as the quality of being honest and having strong moral principles; alternatives are that, to have integrity is to be steadfast in adherence to strict codes of conduct. For researchers this might be defined as the quality to conduct research worthy of the trust of others. Research integrity is a fundamental value for any and all research, for researchers and those who host or fund research activity.”

research misconduct addressed in the revised European Code of Conduct for Research Integrity (section 2): “embrace many things, including insufficient care for the people, animals or objects that are the subject of or participants in research; breaches of confidentiality, violation of protocols, carelessness of the kind that leads to gross error and improprieties of publication involving conflict of interest or appropriation of ideas.
7. BIBLIOGRAPHY & FURTHER READING:

- [Singapore Statement on Research Integrity](#), developed at the 2nd World Conference on Research Integrity, July 2010, in Singapore, as a global guide to the responsible conduct of research.
- World Conference on Research Integrity WCRI (2013). [Montreal Statement](#) on Research Integrity in Cross-Boundary Research Collaborations. European Academies (2017). [Revised European code of conduct on research integrity](#)
- Competitiveness Council, 30/11-01/12/2015, [Council conclusions on research integrity](#)
- [Briefing Paper on Research Integrity: What it Means, Why it Is Important and How we Might Protect it](#) (December 2015)
- [Seven Reasons to Care about Integrity in Research](#) (June 2015)
- “Integrity in Research - A Rationale for Community Action” Expert Group meeting Brussels (BE), 22-23 March 2007/ Final Report
- Académies suisses des sciences Intégrité dans le domaine scientifique: [règlement des académies suisses des sciences](#) (février 2008) « L’intégrité dans la recherche scientifique/Principes de base et procédures»
- Geschäftsordnung der Kommission für wissenschaftliche Integrität zur Untersuchung von Vorwürfen wissenschaftlichen Fehlverhaltens/ [Österreichische Agentur für wissenschaftliche Integrität](#)
- [Code d’ethique de la recherche scientifique en Belgique](#),
- Committee on [Publication Ethics COPE](#)
- International Committee of [Medical Journal Editors: Defining the Role of Authors and Contributors](#)
- The [Belmont Report](#);
- General Data Protection Regulation [GDPR, EU](#);
8. ANNEXES

THE UKRIO Checklist

Please find as example the UKRIO checklist. “The Checklist lists the key points of good practice in research for a research project and is applicable to all subject areas.”

Before conducting your research, and bearing in mind that, subject to legal and ethical requirements, roles and contributions may change during the time span of the research:

1. Does the proposed research address pertinent question(s) and is it designed either to add to existing knowledge about the subject in question or to develop methods for research into it?
2. Is your research design appropriate for the question(s) being asked?
3. Will you have access to all necessary skills and resources to conduct the research?
4. Have you conducted a risk assessment to determine:
   a. whether there are any ethical issues and whether ethics review is required;
   b. the potential for risks to the organisation, the research, or the health, safety and well-being of researchers and research participants; and
   c. what legal requirements govern the research?
5. Will your research comply with all legal and ethical requirements and other applicable guidelines, including those from other organisations and/or countries if relevant?
6. Will your research comply with all requirements of legislation and good practice relating to health and safety?
7. Has your research undergone any necessary ethics review (see 4(a) above), especially if it involves animals, human participants, human material or personal data?
8. Will your research comply with any monitoring and audit requirements?
9. Are you in compliance with any contracts and financial guidelines relating to the project?
10. Have you reached an agreement relating to intellectual property, publication and authorship?
11. Have you reached an agreement relating to collaborative working, if applicable?
12. Have you agreed the roles of researchers and responsibilities for management and supervision?
13. Have all conflicts of interest relating to your research been identified, declared and addressed?
14. Are you aware of the guidance from all applicable organisations on misconduct in research?

When conducting your research:

1. Are you following the agreed research design for the project?
2. Have any changes to the agreed research design been reviewed and approved if applicable?
3. Are you following best practice for the collection, storage and management of data?
4. Are agreed roles and responsibilities for management and supervision being fulfilled?
5. Is your research complying with any monitoring and audit requirements?

When finishing your research:

1. Will your research and its findings be reported accurately, honestly and within a reasonable time frame?
2. Will all contributions to the research be acknowledged?
3. Are agreements relating to intellectual property, publication and authorship being complied with?
4. Will research data be retained in a secure and accessible form and for the required duration?
5. Will your research comply with all legal, ethical and contractual requirements?