

HONESTY

OPENNESS

SELF-CRITICISM

RELIABILITY

FAIRNESS

Research Integrity at Empa

Guidelines for Good Scientific Practice at Empa



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Integrity in research: our quality assurance

As stated as the first priority in our mission, Empa is committed to excellence in research. In order to achieve this goal, several criteria need to be fulfilled. These include the need to recruit highly motivated and qualified staff and to develop the very best research infrastructure. We must also create an environment which promotes responsible conduct through the memory of clear and comprehensive rules, derived from commonly accepted norms and values.

Clear rules form the basis on which credible research can be performed:

- **First** and foremost, because they facilitate the dissemination of sound knowledge by self-critically generating reproducible results from observations and experiments.
- **Secondly**, research increasingly involves a large number of groups comprising various institutes or several disciplines. Awareness of the importance of values such as mutual respect, rules regarding authorship or data handling are essential for successful and lasting cooperation.
- **Thirdly**, openness and transparency are important to maintain the trust of the public, our research partners and funding institutions.

The present guidelines are based on national and international standards.^{2,3,4} Confidence in research and the reputation of Empa depend to a large extent on the responsible actions of its researchers. In order to ensure a sustained high quality of research, every employee is called upon to act responsibly and to follow these guidelines.



Prof. Dr. Tanja Zimmermann
Director

Supporting documents

The following publications served as the basis for the present guidelines:

- “Guidelines for Research Integrity” of the ETH Zürich (2008)⁹
- “Guidelines for research integrity and good scientific practice” of EPF Lausanne (2009)
- “Wissenschaftliche Integrität – Grundsätze und Verfahren” of the Swiss Academies of Arts and Sciences (2008)

These guidelines apply to all research institutes in the ETH Domain: PSI, Empa, Eawag and WSL.



«Honesty, openness, self-criticism, reliability and fairness are the basis for credibility and acceptance in science. Researchers at Empa are committed to these values and to the guidelines which derive from them».

General remarks

Purpose

The present guidelines identify the principles and rules for the planning, execution, evaluation, publishing and peer review of research activities. An investigation in case of suspected misconduct in research is carried out according to the rules of procedure.

Scope

These guidelines apply to all persons working in research at Empa, in particular for researchers and technical staff.

In the context of international collaboration, in particular in large, international research consortia, these guidelines may be adapted.

For staff without an Empa employment contract, such as bachelors and masters degree students, the guidelines of their employer or university apply.

Definitions

Integrity

Integrity encompasses all values and norms which create and maintain trust and credibility.

Scientific Research

Scientific research (also called simply 'research') is the method-driven search for new knowledge. Research is generally organized and performed as projects within the institute or in collaborations with third parties.

Primary data

Primary data are the original, unprocessed data collected from experiments or from other sources (e.g. observation or polls).

Materials

Materials are samples or products of any kind (e.g. prototypes, algorithms, computer programs, materials, manipulated biological systems and organisms) collected or created during research activities.

Researchers

Researchers are experts who are charged with the planning and generation of new knowledge, products, processes, methods and systems, as well as with the management of these projects, therefore also including bachelors, masters and doctoral students. The scientific community comprises all researchers.

Technical staff in research

The technical staff involved in research at Empa comprises those who contribute directly with materials and methods, or intangibly, to a piece of research, above and beyond the maintenance of the large facilities and providing infrastructure support.

Research Leader

The leader of a piece of research, or a research project (the research leader), is the responsible person who is in charge of defining and achieving the research goals. He or she ensures that all persons involved are aware of these guidelines and committed to their implementation and is supported by the employer therefor.

Integrity in research

1. Research planning

Selection of research objectives and methods

The freedom of education and research is ensured within the Constitution of the Swiss Confederation (BV Art. 20). Researchers are free to select their research objectives and methods, taking into consideration the prevailing strategy of Empa, the research focal areas, the annual performance agreement, the available resources and justified restrictions.

Framework conditions

Empa researchers shall comply with legal and internal Empa regulations, including the following regulations for:

- a. Safety at work and protection of health – technical, operational and organisational
- b. Risks which are specific to Empa: protection against radiation and laser beams, the safe handling of chemicals and synthetic nanomaterials, etc.
- c. Research on human beings, in particular the handling of probands and patients
- d. Handling of personal data
- e. Animal protection
- f. Biosafety (handling of pathogenic, genetically modified and quarantine organisms) and bioethics (genome editing, bioterrorism, biodiversity)
- g. Intellectual property
- h. Cross-border research partnerships
- i. Import / export regulations (goods, software, technologies, dual use)
- k. Contractual restrictions during contract research and collaboration with spin-off or external companies. Contracts should be formulated in such a way as to retain independence and freedom of research as much as possible.

Reflection on the consequences of research activities

Empa researchers periodically reflect upon the societal benefits and the potential negative effects of expected or achieved research results, especially the long-term effects (sustainability). Empa engages in open discussion and informs the public about its research activities.⁵

Duties of research leaders

The research leader submits a research plan for internal and/or external assessment, if requested. In each case, the responsibilities, accountability and financing have to be defined prior to the start of the research. The research leader takes all reasonable efforts to ensure that sufficient resources are provided to be able to successfully carry out an approved research project.

Supervision and support of young scientists

Empa's Board of Directors ensures that young scientists are adequately supported at all levels. A written research plan for the dissertation must be drawn up in good time in accordance with the regulations at Empa. This plan must meet the requirements and quality criteria of both Empa and the academic institution, to which the dissertation is submitted. If a research plan has already been prepared elsewhere, it must be submitted to Empa. The objectives and progress of the project will be regularly reviewed by the supervisors.

Conflict of interest

All those involved in a research project are requested to disclose potential conflicts of interest of any kind to the project management, the sponsor and the responsible member of the Empa Management. If independence and objectivity cannot be sufficiently assured, the research activity should not be started or should be discontinued as soon as possible.

Third-party projects

The duties and rights to research results in projects (co-)funded by third-party investment and undertaken at Empa must be specified in a contract with the sponsor before the start of a project. The responsible persons must pay attention to retain the freedom of research and independence as far as possible. Recently released guidelines for trans-boundary collaborations in research should be respected.

2. Execution of research

Collection, documentation and archiving of primary data

Each person involved in a research project bears the responsibility for that part of it which lies under his or her direct control. In particular, the person who conducts the experiment is responsible for the correctness of the acquired data, and the research leader for the data management (processing, storage and utilization of data as well as compliance with data protection regulations).

Access to primary data, in particular data used for publications, has to be ensured after its acquisition for a sufficient period of time in accordance with accepted internal and external regulations. The destruction of primary data must be regulated.

Storage of laboratory logs and electronically stored data must be accordingly organized and its access controlled. The research leader is responsible for the secure storage of material and primary data after completion of a research project.

Generation of research results

Research results are the knowledge gained from primary data.

All steps in the processing of primary data (statistical analysis, conditioning and conversion, evaluation, etc.) must be documented in accordance with good scientific practice, to ensure that the results obtained from the primary data are reproducible and that the experimental steps can be fully reconstructed.

Misconduct such as the fabrication and theft of primary data, plagiarism, or improper manipulation of data is strictly forbidden.

Gray zones, such as the subjective ignoring of acquired data, are to be avoided. The causes for poor experimental reproducibility must be revealed, quantified through statistical analysis and, if necessary, overcome by means of additional experiments.

3. Publication of research results

Rights to primary data and materials

Primary data derived from research projects undertaken at Empa remain the property of Empa, unless otherwise agreed on by contractual regulation with external partners.

Prior to the publication of research results, Empa researchers are not obliged to disclose primary data and materials to persons outside the research project, with the exception of disclosure during evaluations by commissions monitoring the research activities or deciding about the distribution of resources.

The research leader determines, on an individual basis, on the usage of primary data, research results and materials by project participants after they have left the project.

Publication of research results

Planned and ongoing research projects, as well as ongoing patent applications, are fundamentally not public prior to their publication.

The results of research should be made available to project partners, commissions, the scientific community and the public, while respecting patentability and agreements reached. Results from publicly financed projects are basically to be published in the appropriate scientific journals (duty to publish) upon completion of the project.

Following completion of the project and publication of the results, the information necessary for repeating the experiments and verifying the results has to be made accessible to interested third parties. For projects lasting longer than five years data will be made available on an ongoing basis, according to the normal practice within the discipline.

Research results are published coherently and concisely. Care, originality and relevance as measures of

quality take priority over purely numerical indicators. Dividing the results into several smaller, incomplete partial publications (“salami tactics”), publishing the same contents in different scientific media (duplication) or in journals without proven standards (so-called “predatory journals”) should be avoided in order to avoid waste of resources and damage to Empa’s reputation. Wherever possible, Open Access should be prioritised, which also increasingly meets the requirements of funding bodies and research partners. The funds for Open Access publication should be planned in advance.

Authorship

Reputation is the most valuable asset of every researcher. The assessment of the performance and the quality of a researcher is primarily based on his or her publications and their impact. A fair publication practice is therefore of central importance for all researchers.

A person is considered as an author of a scientific publication who fulfils all of the following criteria:

- a. Personally providing a significant contribution to the planning, execution, supervision or interpretation of a piece of research,
- b. participating in the drafting of the manuscript, and
- c. approving the final version of the manuscript.

Contributors who only partially meet the three criteria set out above should be mentioned in the “Acknowledgements” section of the publication. Conflicts between authors should be addressed at an early stage by the corresponding author or by the project leader; if necessary, an ombudsperson should be consulted.

Empa employees who are involved in external research projects at Empa testing facilities and who meet the criteria for authorship are to be listed as authors in the publications.

A managing function, or providing financial, logistic or organisational support for a research project, does not, of itself, entitle a person to appear as an author.

Honorary or courtesy authorship is not acceptable. Authorship and the order of authors must be di-

scussed and agreed upon at an early stage with all those involved. Before starting collaborations responsibilities and procedures for giving credits and for publishing should be agreed upon at an early stage and jointly determined.

The determination of the first place and the order in the publication can be determined according to accepted rules. If necessary, the agreement is to be adapted after further persons have taken part in the project or if there are changes in content.

The corresponding author, as a rule the principle investigator has overall responsibility for the content of the publication and is charged with checking that the designated authors fulfil the criteria for authorship. All co-authors are accountable for the accuracy of content, correct presentation and conclusions that have been drawn from the data, to the extent that they can be verified.

References

Authors must give their sources of material and methods they have used, and cite any work of others that has been used.

Full or partial use of the work of others, without correct citation, is plagiarism and impermissible.

The sources of financial support for the project from third parties should be fully acknowledged.

Institute affiliation

In all publications of research work undertaken partially or entirely at Empa, in particular if use has been made of Empa’s large facilities, the following Empa address has to be indicated⁶:

Empa
Swiss Federal Laboratories for
Materials Science and Technology
CH-ZIP-Empa-location
Schweiz / Switzerland
www.empa.ch

Authors working in two or more institutions should indicate all of their affiliations.

Integrity of peer reviewing

Peer reviewing

Reviews are an essential element of research and we researchers at Empa are therefore committed to act as reviewers, especially for:

- a. The evaluation of research proposals (the Empa Research Commission) and project financing
- b. The assessment of manuscripts for publication
- c. The selection of applicants for employment (e.g. for appointments or promotions)
- d. The assessment of research groups, laboratories or departments (audits)
- e. An expertise requested by courts of law and authorities or requested by all parties involved in the specific issue.

Criteria for the selection of experts include their professional competence and integrity, and the avoidance of conflicts of interest.

An appointed person must provide an opinion which is unbiased, constructive and punctual, and refrain from making emotional, derogatory or offensive remarks.

The reviewer is obliged to retain confidentiality, and therefore:

- a. treat all data and information subjected to the assessment as confidential, as long as this has not been made public by the persons being reviewed,
- b. may not obtain other opinions to use as part of his or her judgement, without the consent of the body responsible for requesting the review,
- c. make no personal use of confidential information disclosed to him or her in the context of the reviewing process.

Disclosure of interests and conflicts of interest

Researchers at Empa who are asked to provide an expert opinion on a research project that competes directly with their own research interests must disclose their conflict of interest and/or decline to offer an opinion. It is then left to the body making the request to choose another expert.

Final regulations

Action following alleged violation of integrity

In the case of an alleged violation of integrity in research at Empa, the procedure prescribed for Empa (Verfahrensordnung)⁷ will be followed.

Duty to inform

Empa Management and the Human Resources Section will ensure the release, distribution and implementation of these guidelines to all active staff and new Empa employees, according to the scope of their applicability.

Enforcement date

The revision of the guidelines issued will become effective on August 1st, 2020.⁸

Endnotes

¹ The efforts of those who have helped to create the present guidelines are acknowledged with thanks.

² akademien-schweiz, www.akademien-schweiz.ch and European Code of Conduct for Integrity in Research.

³ ALLEA - All European Academies, Berlin 2018

⁴ Committee on Publication Ethics COPE. Guide-lines. <http://publicationethics.org/resources/guidelines> (accessed November 25, 2019)

⁵ The Empa Academy is as a permanent organisation entrusted with the task of disseminating information on Empa's research activities and results. Guided tours are conducted for groups of visitors and school classes interested in Empa's work.

⁶ Empa-locations:

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⁷ The document "Rules of Procedure in the event of a suspected violation of research integrity at Empa" is an integral part of the present guidelines (see Appendix).

⁸ Revisions to these guidelines will be publicised via the Empa Intranet.

⁹ The reader's attention is drawn to the ETH Zurich's Rechtssammlung ("Compilation of Regulations"), in particular Section 4 "Research and scientific services". Some of these ordinances and recommendations are relevant to the research organisations of the ETH Domain. <http://www.rechtssammlung.ethz.ch>

Appendix:

Rules of Procedure in the event of a suspected violation of research integrity at Empa

Reference to content

The document “Research Integrity at Empa” defines the binding guidelines for our scientific work.*

Article 1 Scope of the Rules of Procedure

¹ In case a violation of the guidelines on “Research integrity at Empa” is suspected, the procedure for investigation of the suspected violation shall be governed by these Rules of Procedure and, in addition, by the Federal Act on Administrative Procedure of 20 December 1968 (SR 172.021).

² Any sanctions in connection with a violation of the guidelines on “Research integrity at Empa” shall be governed as follows;

- for scientific and technical staff of Empa according to the Personnel Law (BPG/PVO-ETH),**
- for employees without a Empa employment contract, guest scientists, bachelor and master students) by their employer or university in accordance with their respective law.

Article 2 Misconduct in research

A misconduct is deemed to have occurred, if the rules of good scientific practice, as detailed in the guidelines “Research integrity at Empa”, are violated. Co-responsibility exists in the case of active participation in violations by others and gross neglect of the direct and institutional duty of supervision.

Article 3 Trusted Intermediary

¹ The Trusted Intermediary*** is appointed by the Director. He/she shall be available to advise, support and mediate with and for researchers on issues relating to research integrity and good scientific practice. In addition, he/she may receive reports of legally or ethically incorrect conduct and forward them to the competent authority.

² If, in connection with a consultation, the Trusted Intermediary establishes a suspicion of research misconduct, he or she shall consult the person seeking advice as to whether a report of suspected research misconduct should be made to the Director.

³ A report of suspected research misconduct that is made directly to the Trusted Intermediary or to another department at Empa must be forwarded to the Director.

Article 4 Preliminary examination and initiation of proceedings

¹ If a suspicion of misconduct is brought to the attention of the Director, the Director may arrange for a preliminary investigation to be conducted by an internal or external expert on the basis of the documents and information submitted. This preliminary examination is not part of the procedure and serves only to clarify whether the suspicion raised justifies an investigation procedure.

² The Director shall decide whether to initiate an investigation procedure.

³ The Director shall inform the accused person of the initiation of an investigation procedure.

⁴ The Director shall inform the notifying person**** of his or her decision to open an investigation procedure, provided that the notifying person is affected by the decision and has a legitimate reason for being informed.

⁵ If deemed necessary, the Director may provide appropriate information about the initiation of an investigation procedure.

Article 5 Investigation Commission

¹ After the initiation of an investigation procedure, the investigation shall be conducted exclusively by the investigation commission.

² The Director shall decide on the composition of the investigation commission and its chairperson on a case-by-case basis. Members of the investigation commission are in any case

- the chairperson of the investigation commission,
- an expert from Empa,
- an external expert.

³ The accused person must be informed about the composition of the investigation commission at the beginning of the investigation procedure. The accused person shall be given the opportunity to submit in writing, justified requests for the recusal of specific commission members due to bias or conflicts of interest. The Director shall decide on such requests.

⁴ The members of the investigation commission are obliged to maintain confidentiality about the procedure and the associated investigations.

⁵ The investigation commission shall carry out the necessary investigations. It shall give the accused person the opportunity to inspect the files, to comment on the accusations, to submit evidence and to submit requests for evidence.

⁶ The investigation commission shall summarise the results of its investigation and its assessment of whether misconduct has occurred in a written report. The accused person shall have the right to inspect this report before it is forwarded to the Director and to attach written comments. The investigation commission shall forward the whole investigation file to the Director, together with the report and written comments of the accused person.

Article 6 Decision

¹ The Director shall decide on further action on the basis of the report, the investigation files and the personal hearing of the accused person.

² If new considerations emerge, the Director may initiate further investigations and supplement the investigation file accordingly.

³ The Director shall inform the accused person of his or her decision of the case, together with an explanation.

⁴ The Director shall initiate any sanctions based on the applicable legal provisions (in particular BPG and PVO) and taking into account the institutional responsibilities.

⁵ The notifying person shall be informed about the conclusion of the proceedings in an appropriate manner provided they have a legitimate reason for being informed.

⁶ The Director's decision must be published in an appropriate form if the initiation of the investigation has already been announced. It must also be published in an appropriate form if the accused person so requests.

Article 7 Closing of the procedure

¹ If the Director discontinues the procedure, he/she shall record the reasons for the discontinuation in the decision.

² At the request of the accused person, the discontinuation of the procedure must be communicated in an appropriate manner.

Article 8 General procedural provisions

¹ Duration: The procedure must be appropriate to the individual case, but shall be completed as quickly as possible. The Director shall determine the timeframe when the investigation commission is appointed.

² Documentation: Written minutes are kept of the individual procedural steps. The files must be kept for at least 10 years after the conclusion of the procedure.

³ Protection of personality: In principle, the protection of personal privacy applies

through-out the entire procedure.

- a. The Director may provide information on the results and decisions of the procedure in an appropriate manner. He/she decides on the time, form, content and the group of addressees, i.e. parties to the proceedings, other persons affected by the proceedings (e.g. the notifying person), third parties (e.g. superiors, employees) or the public. The Director makes his/her decision by taking into account the protection of the privacy and the interests of the persons involved, the institution and the public.
- b. The Director shall protect the notifying person against reprisals or discrimination, in particular if the notifying person is in a relationship of dependency with the accused person. Reprisals or discrimination will be sanctioned as infringements of the guidelines "Research Integrity at Empa".

Article 9 Issue an injunction

If no agreement can be reached in the event of a dispute regarding compliance with the guidelines on "Research Integrity at Empa", the Director shall issue an injunction.

Article 10 Criminal liability

¹ If, in the case of serious research misconduct the act of committing an offence under federal or cantonal criminal law also comes into consideration, Empa shall file a complaint.

² Art. 58b PVO applies to employees of the Empa.

³ Anyone who knowingly falsely accuses a person of research misconduct will be subject to measures under personnel and/or criminal law.

Artikel 11 Entry into force

These Rules of Procedure shall enter into force on August 1st, 2020. *****

Remark

This is the English translation of the "Verfahrensordnung bei vermuteter Verletzung der Integrität in der Forschung an der Empa" and is provided for reference and understanding only. The German version of this document is legally binding.

Footnotes

* The guidelines "Research integrity at Empa" are part of the Empa employment contract.

** Personnel law (BPG / PVO)

All Empa employees are subject to the Federal Personnel Act (BPG, SR 172.220.1), which regulates, among other things, the sanctions in the event of violation of obligations under labour law (Art. 25). For Empa and the other institutions of the ETH Domain, the Personnel Ordinance for the Federal Institutes of Technology (PVO, SR 172.220.113) also applies. Art. 9 regulates the protection of personal privacy and Art. 58 the violation of obligations under labour law. All Empa employees have access to the PVO.

*** A Trusted Intermediary is an independent, internal and/or external expert who is familiar with the circumstances of research at Empa and who can be contacted in the event of research-specific matters and conflicts. He or she can be entrusted as an expert with the preliminary examination as defined in Art. 4, provided that he or she has not already been appointed as the Trusted Intermediary for the case in question.

**** A notifying person is a person who has reported a suspected violation of the guidelines "Research integrity at Empa". He or she has no party status in an investigation procedure. Confidentiality applies for the investigation procedure.

***** Revisions to the Rules of Procedure will be published internally at Empa in an appropriate form and posted on the Empa intranet site.

Empa – The Place where Innovation Starts

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