

UFZ Regulation | IR-17/12 | 24.03.2023

Rules for Safeguarding Good Scientific Practice at the UFZ

	Approved	Enacted	
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Date	19.04.2023	19.04.2023	19.04.2023
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Document history

Date	Version	
18.12.2014	1	Adoption of the “Rules for safeguarding good scientific practice at the Helmholtz Centre for Environmental Research GmbH – UFZ”
02.03.2021	2	New version based on the update of the “Guidelines for safeguarding good research practice” of the German Research Foundation (in force since 1 August 2019, to be implemented by 31 July 2022)
15.06.2022	2	Feedback on the new version by the German Research Foundation with comments for further processing. New deadline for the entry into force of the “Rules for safeguarding good scientific practice at the UFZ” is 31 July 2023
06.03.2023	3	Revision of the new version based on feedback from the German Research Foundation completed by the working group “Good scientific practice” of the Scientific and Technical Council (WTR-AG GwP)
20.03.2023	3	WTR feedback deadline on the revised “Rules for safeguarding good scientific practice at the UFZ”
24.03.2023	3	Sending the revised rules to the German Research Foundation
24.03.2023	3	Approval by the German Research Foundation
19.04.2023	3	Enactment of the revised rules by UFZ’s Executive Management

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Preamble

Since the beginning of modern science in the 17th century, generally accepted principles of good scientific practice have evolved. These include the following maxims:

- Conscientiousness and honesty in the investigation and presentation of scientific facts
- Honesty in attributing ideas and results to their authors
- The most complete documentation and presentation possible for the purpose of open scientific discourse
- Reviews and objectively justified criticism of ideas, procedures and results
- The right to err

The constitutionally guaranteed freedom of science is inseparably linked to a corresponding responsibility. Taking this responsibility fully into account and anchoring it as a guideline for one's own actions is, first and foremost, the task of every scientist as well as of those institutions in which science is written. Scientific integrity strengthens and promotes society's indispensable trust in science. It includes respectful treatment of each other and of study participants, as well as animals, cultural assets and the environment in the focus of studies.

The basic rules of good scientific practice listed here are based on the recommendations and guidelines of the German Research Foundation (DFG)¹ and consider also the specific research conditions of the Helmholtz Centre for Environmental Research GmbH – UFZ (hereinafter referred to as UFZ). The Helmholtz Association's "Guidelines for safeguarding good scientific practice (GSP) and procedures for scientific misconduct" set out the basic framework, common goals and central tasks.

The aim at UFZ is to uphold corresponding basic rules of care and guarantee reliability in an interdisciplinary research context characterised by digital change, and to define and establish them by means of quality-assuring standards (> [DFG guideline 1](#)).

UFZ is responsible for organising the entire research process and supports the public communication of research and results. Inseparably linked to this are the appropriate individual promotion of young scientists and the career advancement of scientific and research support staff.² It is particularly important for UFZ to promote and maintain an atmosphere of openness, creativity and willingness to perform. A lively scientific life, which takes place in appropriate working groups, is an important element in preventing scientific misconduct. In fulfilling its responsibility, UFZ takes precautions against scientific misconduct. The UFZ management guidelines and principles of doctoral supervision, which supplement the following "Rules for safeguarding good scientific practice at the UFZ", also serve this purpose.³ UFZ will investigate any concrete suspicion of scientific misconduct. People who report a reasonable suspicion of scientific misconduct fulfil an indispensable function for the self-control of science. Should the suspicion of misconduct be confirmed after clarification of the facts, the necessary measures will be taken in the individual case – within the framework of the legal possibilities.

¹ Specifically, they are based on the DFG recommendations of 17 June 1998 and their update of 3 July 2013, as well as the DFG code of conduct "Guidelines for safeguarding good research practice", in force since 1 August 2019. https://www.dfg.de/foerderung/grundlagen_rahmenbedingungen/gwp/ [checked 23.10.2020]. In addition, formulations from the Max Planck Society guidelines of 2009 <https://www.mpg.de/199493/regelnWissPraxis.pdf> and from the ICMJE guidelines <https://www.icmje.org/recommendations/browse/roles-and-responsibilities/> were adopted.

² Scientific support staff at UFZ include, for example, laboratory technicians, technicians and engineers in the scientific departments, but in individual cases also employees in staff units and administrative departments (e.g. ZENCO, WKDV, WTT), provided that a significant scientific contribution is made.

³ These include the UFZ "Management guidelines" and the "Mission statement on structured doctoral supervision" (cf. both at <https://www.intranet.ufz.de/index.php?en=44530>).

In addition to the UFZ ombudspersons, the independent body “The German Research Ombudsman”⁴ set up by DFG is a trustworthy contact, which offers advice and conflict mediation in matters of good scientific practice and its possible violation through scientific dishonesty. The Helmholtz Association’s central ombudsperson⁵ offers independent advice to the Helmholtz Centres, oversees central tasks of the Helmholtz Association within the framework of good scientific practice and can take action in serious suspected cases of scientific misconduct.

Part A: Good scientific practice

The rules of good scientific practice are binding for all those involved in research work at UFZ. They are notified to the employees and associates by the Executive Management of UFZ. The UFZ management obliges the scientists and research support staff to comply with them. Every scientist is responsible for ensuring that their own conduct complies with the standards of good scientific practice (> DFG guideline 1). Scientists at all career levels are expected to regularly update their knowledge of the standards of good scientific practice as well as on the state of research (> DFG guideline 2). UFZ regularly offers corresponding training.

1. Principles of scientific work (> DFG guidelines 1, 2, 4–17)

In addition to compliance with the legal rules at national, European and international level, the following rules in particular must be paid attention to as general principles of scientific work at UFZ:

a) General rules of scientific practice shall include

- Personal responsibility for the realisation of the fundamental values and standards of scientific work in daily work and standing up for these values (professional ethics); (>DFG guideline 2)
- Maintaining scientific honesty, conscientiousness, and readiness for open critical discourse as a basic requirement of scientific work (cf. 2.);
- Observance of the rule of systematic scepticism: One’s own results and the results of one’s own working group are to be consistently doubted. The test of a scientific result can be its reproducibility. The more surprising but also the more desirable a result is, the more important it is to independently repeat the path to the result – as far as the testing is possible with reasonable effort – before it is communicated externally; (>DFG guideline 2)
- Awareness of tacit axiomatic assumptions; control of one’s own interests or biases (“confirmation bias”); systematic attention to possible misinterpretations as a result of the methodologically limited comprehensibility of the research object (overgeneralisation);
- Ensuring appropriate subject-specific supervision of young scientists and teaching the rules of good scientific practice at the earliest possible stage in academic teaching and scientific training (cf. 3. and 4.); (>DFG guidelines 2 and 4)
- Prioritise originality and quality over quantity as performance and evaluation criteria for recruitment, promotions, appointments and budget allocations, and align performance and evaluation criteria accordingly; (>DFG guideline 5)
- Clear distribution of roles and responsibilities of the scientists involved in a research project as well as of the research support staff at all times during a research project; (>DFG guideline 8)
- Consideration of the current state of research when planning a research project (cf. 9.); (>DFG guideline 9)
- Strict honesty with regard to one’s own and third parties’ contributions;

⁴ <https://ombudsman-fuer-die-wissenschaft.de/>

⁵ <https://www.helmholtz.de/ueber-uns/die-gemeinschaft/gute-wissenschaftliche-praxis/>

- Consideration of legal framework conditions and ethical principles and obtaining necessary approvals or ethics votes as part of the preparation of a research project from the relevant authorities or bodies; (>DFG guideline 10, see 6.)
- Application of comprehensible and well-founded methods as well as quality assurance and establishment of standards in the development of new methods; (>DFG guideline 11)
- Strict adherence to general and discipline-specific rules for the collection, selection, processing, storage and publication of data and the development of results, as well as the comprehensible and complete documentation of the research process. (>DFG guidelines 5, 7, 11, 12, 13, 17)

b) Rules of collegiality and cooperation shall include (cf. 2.)

- No obstruction of the scientific work of others; (>DFG guideline 2)
- Willingness to admit own mistakes and errors; (>DFG guideline 2)
- Openness to objectively justified scientific criticism and doubts from colleagues and staff, regardless of the hierarchical position of those involved; (>DFG guideline 4)
- Promoting the scientific qualification of young researchers.

c) Rules for the publication of results shall include (cf. 7.)

- Research results shall be, as far as possible, introduced into the scientific discourse (principle of the publicity of research). (>DFG guideline 13)
- The decision to publish or not to publish the results is up to the researchers, taking account the common practices of the respective discipline, but uninfluenced by third parties.
- The unselected documentation of results according to the respective disciplinary conventions, even if they do not support research hypotheses. All results should be included in the publication process in order to prevent publication bias. (>DFG guideline 7, 12)
- Correct published errors in an appropriate manner.
- Acknowledge the contributions of collaborators and co-authors in an appropriate manner. (>DFG guideline 14)
- If possible, publish the research results obtained with public funds, the data obtained and the methods (including software) developed as part of the research process in accordance with the FAIR principles (“Findable, Accessible, Interoperable, Reusable”) and in compliance with the Helmholtz Open Science Briefing “Good (digital) scientific practice and open science”⁶. (>DFG guideline 13)

d) Rules for appropriate assessment processes shall include, e.g. (cf. 7.)

- Willingness in principle to participate in review processes in the sense of scientific quality control;
- Publishers and editors of specialist journals to take account of requirements for high-quality science through strict review procedures;
- Careful, disinterested and unbiased peer review of colleagues’ work (manuscripts, grant applications as well as applications in the context of advisory and decision-making bodies); (>DFG guideline 16)
- No misuse of the knowledge gained through the review process; (>DFG guideline 16)
- Waiver of peer review in case of justifiable non-expertise in the respective field.

⁶ Ferguson, L. M., Pampel, H., Bruch, C., Bertelmann, R., Weisweiler, N. L., Schrader, A. C., Messerschmidt, R., Faensen, K. (2020): Good (digital) scientific practice and open Science: Support and best practices for the implementation of the DFG code of conduct “Guidelines for ensuring good scientific practice”, (Helmholtz Open Science Briefing), Potsdam: Helmholtz Open Science Office, 19 p.
<https://doi.org/10.2312/os.helmholtz.012>

e) UFZ-specific rules

- Observance of UFZ's internal regulations related to aspects of good scientific practice⁷, e.g. the guideline "Further principles for supporting UFZ staff in setting up companies" (cf. 8.), UFZ's publication guideline (cf. 7.), the guideline on data protection and information security at UFZ or the regulation on the dissemination of research results such as digital data, maps or aerial photographs to interested parties outside the UFZ.

2. Leadership responsibility and cooperation in scientific organisational units (>DFG guidelines 3, 4)

The UFZ Executive Management creates the framework conditions for scientific work. It is responsible for maintaining and communicating good scientific practice and for providing appropriate career support for all scientists. The UFZ Executive Management guarantees the conditions for scientists to comply with legal and ethical standards.

The line managers of the scientific organisational units at UFZ are responsible and ensure that management tasks, supervision and tasks of conflict regulation and quality assurance are clearly assigned, regularly reviewed and adjusted as necessary. They shall ensure that these tasks can actually be performed and that they are communicated to the members of their organisational unit in an appropriate manner. In particular, managers are obliged to provide their associates with the working materials required for quality assurance (e.g. laboratory books, equipment books, etc.), to train them in these and to verifiably check the appropriate use of these.

All members of a scientific organisational unit must be aware of their roles, rights and duties (>DFG guideline 8). Cooperation in scientific working groups must be of such a manner that the results achieved via the specialised division of labour can be mutually communicated, criticised and integrated into a common body of knowledge, irrespective of hierarchical considerations. This also includes adequate data management (cf. 5.). The management of an organisational unit requires expertise, presence and overview. Where this is no longer sufficiently given due to the size of the unit or for other reasons, management tasks should be delegated in such a way that the respective management span remains manageable.

The management tasks also include granting the scientists and the research support staff a ratio of support and personal responsibility appropriate to their career level and an adequate status with corresponding participation rights. Hence, they will be enabled to shape their careers through increasing independence.

The management task also includes, in particular, ensuring appropriate individual supervision of young scientists (cf. 3.) as well as career support for scientific and research support staff. Managers should regularly discuss career goals and career options at UFZ with employees on temporary contracts in particular, for example in the context of annual appraisal interviews. They should offer them an honest assessment of their scientific achievements with a view to a successful career in science and also discuss and, if necessary, promote their development in other, science-related professional fields.

In addition, individual counselling for careers and career paths is offered by the Career Centre. Further training opportunities for scientific and research support staff are offered through human resources development. In addition, there is the possibility to apply for participation in mentoring programmes.

Gender equality and other aspects of diversity are considered in staff selection and development. The relevant processes are transparent and designed to avoid unconscious bias.

Abuse of power and exploitation of dependency relationships are to be prevented by appropriate organisational measures, both at the level of the individual scientific organisational unit and at the level of the UFZ Executive Management.

⁷ <https://www.ufz.de/index.php?de=36448>; <https://www.ufz.de/index.php?en=36448>

3. Supervision of young researchers (> DFG guidelines 3, 4)

Special attention must be paid to the training and promotion of young scientists and their guidance in complying with the principles of good scientific practice.

In the scientific organisational units of UFZ, care must be taken to ensure that appropriate supervision is provided for young scientists and that a primary contact person exists (see regulation for doctoral candidates and supervisors at UFZ). (>DFG guideline 4)

Structured supervision of young scientists is established at UFZ and embedded in the concept of the “Helmholtz Interdisciplinary **GRAD**uate School for **En**vironmental Research (HIGRADE)”. PhD candidates are supervised by an advisory committee at UFZ. The framework for supervision is laid down in a supervision agreement. Regular obligatory reports on the progress of work serve to provide insight into the progress of the doctorate (>DFG guideline 3). To build up competencies in the area of supervision, UFZ regularly offers further training for supervisors and junior researchers on this topic. In the area of good scientific practice, UFZ regularly offers further training opportunities for PhD candidates and postdocs, thus ensuring that the basics of good scientific work are taught at the earliest possible stage (>DFG guideline 2). While the training of interns and bachelor’s and master’s students in good scientific practice is not primarily the responsibility of UFZ but of the respective universities, awareness at UFZ shall be raised that the foundations for good scientific practice are already being laid in teaching and supervision.

4. Cross-phase quality assurance (>DFG guideline 7)

Researchers at UFZ support each other in the continuous learning and training process and engage in regular exchange (> DFG guideline 2). UFZ ensures the quality of its research through suitable framework conditions and qualification offers.

Quality assurance concerns the entire research process from the conception of a research project to publication (cf. 7.). When planning a research project, scientists read up on the current state of the art (>DFG guideline 9), develop and document a data management strategy (cf. 5.) for their projects, and ensure that all legal and ethical framework conditions are met (cf. 6.). From the beginning of the project, the project leaders ensure a clear and appropriate distribution of roles and responsibilities of the participants involved (cf. 9., >DFG guideline 8).

Throughout the research process, scientists ensure that subject-specific standards and established methods are adhered to. This applies, for example, to the calibration of equipment, the selection and use of research software, its development and programming, and the keeping of laboratory books (cf. 5.). During analysis, (unconscious) distortions of results and thus their (mis)interpretation must be avoided.

Whenever scientific findings are made publicly available (in the narrower sense in the form of publications, but also in the broader sense via other communication channels), the quality assurance mechanisms applied are always to be explained (cf. 5.). If errors come to light that necessitate a retraction of a publication, the researchers work as quickly as possible to ensure that the correction or retraction is made and indicated accordingly.

Researchers shall examine their research project, methods and results from a diversity perspective, such as different cultural perspectives of researchers and with regard to the gender of test subjects and model organisms (>DFG guideline 9).

UFZ fulfils its responsibility for quality assurance by informing its staff at regular intervals (usually every three years) about the principles of scientific work and good scientific practice and about the consequences of scientific misconduct. In addition, UFZ organises suitable and obligatory training courses on this subject as required. PhD candidates are informed about the rules of good scientific practice through obligatory training courses within HIGRADE. The briefing will be documented.

5. Securing, storing and using primary data and logs (>DFG guidelines 7, 12, 13, 15, 17).

An essential part of quality assurance is that results or findings can be replicated or confirmed by other scientists. Scientific investigations, experiments and numerical calculations can only be

reproduced or reconstructed if all important steps are documented in a comprehensible manner and subsequent use is guaranteed. Therefore, all data, organisms, materials, software, the research process and all results used in the research process must be documented comprehensibly and completely in a form suitable for the field, and their origin must be identifiable (>DFG guideline 7). This safeguarding and storage of primary data and protocols is indispensable to enable the verifiability, objective criticism and reusability of scientific results. This applies to all scientific investigations that form the basis of publications, patents or ongoing research and development work. Documentation and research results must not be manipulated. In the development of research software, the source code is documented in a persistent and citable manner (>DFG guidelines 7, 12). The FAIR principles⁸ (“Findable, Accessible, Interoperable, Reusable”) should be observed wherever possible and reasonable (e.g. with regard to data protection or patent applications). In addition to publications in books and journals, specialist repositories, data and software repositories as well as blogs should also be considered (> DFG guideline 15). Furthermore, the UFZ archiving portal is available for this purpose (> DFG guideline 13, cf. 7.). If there are comprehensible reasons for not retaining certain data, the scientists must explain this (> DFG guidelines 12, 17). The Helmholtz Open Science Office provides support with its briefing “Good (digital) scientific practice and open science”⁶.

The documentation as well as the data obtained in the course of the investigations must be kept legibly on suitable carriers for at least ten years (>DFG guideline 17). The retention period begins with the date on which public access was established. Personal data that would become worthless for research through anonymisation (e.g. qualitative social research data) are excluded from the ten-year retention period. The provisions of the General Data Protection Regulation and the German Federal Data Protection Act⁹ apply here (cf. 6.). If the documentation of research results does not meet the corresponding (professional) requirements, the restrictions and the reasons for them are explained in a comprehensible manner.

Responsibility for the regulation and implementation of professional and proper documentation and the preservation of legibility lies with the head of department or the project management of cross-departmental projects. Exceptions apply to personal research data that is subject to data protection (see 6.). Access rules for third parties for the use and reuse of data from past projects are decided by the department or project management or, in the case of an ongoing research project, by the authorised users (in particular in accordance with data protection regulations) (> DFG guideline 10). In the case of legitimate interest, access to the data must be granted, in particular, to those who collected it. For example, persons who have left UFZ should have access to data after consultation, for example to be able to complete publications.

Thus, for the specific case of laboratory work at UFZ, the following applies: All persons working in laboratories at UFZ are provided with laboratory books with a table of contents and continuous page numbering. This book records all work steps, considerations and observations on experiments as well as data, results and working materials that need to be archived.

Digital data relevant to research are backed up at regular intervals in the UFZ archiving portal. UFZ uses suitable technical measures to ensure the integrity of the data saved there for a period of at least ten years (>DFG guideline 17). The collection and evaluation of digital research data¹⁰ is documented by creating a central directory in the laboratory book. The managers of the respective organisational units (head of department or head of working groups) specify how the research data are to be designated in the laboratory books and regularly check compliance with these specifications.

The laboratory books, together with the digital research data, shall be handed over to the responsible manager at the latest upon termination of the employment relationship.

⁸ Wilkinson, M. D. et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific data*, 3(1), 1-9. <https://www.nature.com/articles/sdata201618>

⁹ See Art. 7 DSGVO (General Data Protection Regulation) and § 51 BDSG (Federal Data Protection Act).

¹⁰ Digital research data include “all digitally available data that are created during the research process or are its result”. Maxi Kindling, Peter Schirmbacher p. 130: Die digitale Forschungswelt als Gegenstand der Forschung. IWP. 2013. pp. 127-136. DOI: 10.1515/iwp-2013-0017

6. Legal framework, research ethics and rights of use (>DFG guideline 10)

The constitutionally granted freedom of research does not release researchers from compliance with legal requirements, ethical principles and obligations arising from contracts with third parties, e.g. on the granting of rights of use to research data and research results. Where necessary, researchers obtain approvals and ethics votes from the relevant authorities and bodies.

In fulfilling this responsibility, researchers review their research projects thoroughly from an ethical and legal point of view with a view to possible research consequences, e.g. misuse of research results or use of security-relevant research results for military purposes (“dual use”). This reflection on the impact on society and the environment relates not only to possible applications and appropriations of results, but also to the choice of the research object and the design of the research process.

Personal data, as collected at UFZ especially in medical and social science studies as well as in citizen science projects, present researchers with a special ethical and legal responsibility. Personal data is any information relating to an identified or identifiable natural person. The principles for the processing of personal data according to Art. 5 GDPR (lawfulness of processing, transparency, purpose limitation, data minimisation, accuracy, storage limitation, integrity and confidentiality as well as accountability) must be complied with.

Personal data may only be collected if there is a legal basis for the processing. In the field of medical, social or citizen science research, consent is regularly considered (cf. “informed consent”). Researchers are therefore obliged to obtain documented declarations of consent from their test subjects and interviewees in accordance with the applicable data protection regulations.⁷ They must inform the test subjects and interviewees in an understandable manner about the purpose of use, the type of data collected and their rights (voluntariness, right of revocation). If consent is revoked, the personal data processed on the basis of the revoked consent must be deleted. Research data without personal reference (directly or indirectly) is not affected by this obligation to delete.

According to the principles for the processing of personal data of the GDPR, the anonymisation of personal data must be aimed for as a matter of principle. In cases where personal data of test subjects and interviewed persons are the subject of research and these cannot be completely anonymised (e.g. expert interviews, movement profiles, social science or ethnographic observation data), the protection of personal data and compliance with the principles for the processing of personal data must be ensured by technical and organisational measures. In any case, personal data must be anonymised as soon as this is possible according to the research purpose.

When storing data, identification features of test subjects or interviewed persons (e.g. name, contact data, etc.) and the collected research data of a data set must be stored separately. For this purpose, the personal data in the research file are replaced by a case ID and stored together with the case ID in a separate file. They may only be merged with the personal data insofar as the research purpose requires this.

If questions arise regarding the handling of personal data, the responsible data protection officer should be consulted. Researchers shall enter into documented agreements on the rights of use of the research results with external parties at the earliest stage in research projects, if possible and reasonable.

7. Scientific publications, reviews, authorships and editorships (>DFG guidelines 13, 14, 15, 16)

Publications are the most important medium for communicating research results to the scientific and general public. In this way, authors publish results for whose scientific reliability they assume responsibility. Unless there are good reasons not to do so, scientists contribute all results to the scientific discourse. Publications of new scientific findings must describe the underlying results, research data and the methods used in a complete and comprehensible manner. The handling of non-knowledge and uncertainties in the research process should be reflected and described. For reasons of comprehensibility, connectivity of the research and reusability, authors should, as far as

possible and reasonable, make available related documentation of data, materials and the research process (cf. 5., Documentation according to FAIR principles). Authors' own and external preparatory work or data and materials used should be fully and correctly documented. Previously published results should only be repeated insofar as it appears necessary for the understanding of the context. Findings that support or question the results presented should be reported in equal measure. In keeping with the idea of "quality before quantity", inappropriately small publications should be avoided, and the repetition of previously published content should be limited as far as possible (> [DFG guideline 13](#)). The publication guidelines of UFZ must be observed for every publication. Publication regulations of individual funding organisations must be observed.

The question of attributing authorship is both a problem of scientific ethics and one of copyright law. Anyone who claims or assigns authorship to others without authorisation is acting illegally. Anyone who unjustifiably denies authorship is, at the very least, acting unethically. One concern of scientific ethics is the attribution of scientific achievement. Copyright, on the other hand, does not generally protect the content as such in scientific publications, but only the authorship.

All persons named as authors of a publication must be entitled to authorship and all persons entitled to authorship must be named as authors. Authors must have made a genuine, traceable contribution to the content of a scientific text, data or software publication in order to be able to claim public responsibility for a share of the publication content that can be attributed to them (>[DFG guideline 14](#)). Whether a contribution is genuine and traceable must be examined separately in each individual case and depends on the subject area concerned. In the case of text publications, a genuine, comprehensible contribution exists, in particular, if a person has contributed in a scientifically relevant way to the publication, e.g.

- a) the development and conception of the research project, or
- b) the preparation, generation, collection, processing, provision of the data, the software, the sources, or
- c) the analysis/evaluation or interpretation of the data, sources and the conclusions drawn therefrom, and
- d) the writing of the manuscript (i.e. formulation or critical revision to a significant extent, i.e. intellectual content and not purely linguistic revision).

Co-authorship in a scientifically relevant way is given if a), b) or c) and d) are fulfilled. If these conditions are met, co-authorship may not be denied. Those who have participated in a), b) or c) should also be given the opportunity to participate in d). A scientifically relevant contribution to the writing of a manuscript may be made in preparation in a language other than the language in which the publication is written.

In the case of data publications, a genuine, traceable contribution exists if a person has participated in a scientifically relevant way in the development, production, collection, processing or provision of the data.

In the case of software publications, a genuine contribution exists if a person has verifiably made this contribution in the corresponding software repository and is listed there as a contributor. Persons who are not listed as contributors in the corresponding software repository, but who have contributed significantly to the development of the software, should also be able to be listed as contributors in the corresponding software repository via the options provided therein.

The solicitation or provision of funding, the collection of data or the general management of a research institution or group do not constitute, in themselves, authorship. So-called "honorary authorship" is inadmissible. Support from third parties who do not meet the above authorship criteria should be acknowledged in footnotes, in the preface or in the acknowledgement.

The author ranking must be a joint decision of all co-authors. This decision must be made in good time, usually at the latest when the manuscript is being formulated. The reasons for the author ranking must be comprehensible and should consider the conventions of the discipline. For the publication of original work, conventions have become established in the scientific community in recent years, especially in many experimental subjects, which also allow outsiders to roughly estimate the contributions of co-authors based on their placement in the author line. In this way, the author line also serves the correct external perception and not only the fair recognition of the

claims of co-authorship acquired through collaboration. The authors always bear joint responsibility for the content, unless explicitly stated otherwise. In the case of an authors' collective, the prominent members of the authors' collective (e.g. first, corresponding and senior authors, the latter being the last authors in many subject areas) must jointly assume responsibility for compliance with good scientific practice and integrity in relation to the overall work, from its inception to publication.

All authors must give final approval of the publication in the version to be submitted for publication. They must have confidence in the integrity of their co-authors' contributions. Authors may not refuse consent to publication without sufficient reason. A refusal to consent to the publication of results must be justified by a verifiable criticism of data, methods or results. Authors shall carefully select the publication medium – taking into account its quality and visibility in the respective field. The scientific quality of a contribution does not depend on the publication medium in which it is made publicly available. A new or unknown publication medium is examined for their seriousness (>DFG guideline 15). One criterion in the selection decision is whether the publication medium has established its own guidelines for good scientific practice or obviously follows rules of good scientific practice.

Authors shall ensure and, as far as possible, work towards ensuring that their research contributions are labelled by publishers or infrastructure providers in such a way that they can be correctly cited by users. Funding or funding sources and possible conflicts of interest must be disclosed.

Scientists should generally be willing to participate in review processes in the interest of scientific quality control. Publication media for which UFZ scientists are involved in peer review are carefully selected. One criterion in the selection decision is whether the publication medium has established its own guidelines for good scientific practice. The review of manuscripts, funding applications and applications within the framework of advisory and decision-making bodies must be carried out carefully, strictly confidentially, disinterestedly and without bias (>DFG guideline 16). In particular, the knowledge gained through the evaluation process must not be misused. Courtesy appraisals are excluded. If facts exist that could give rise to concerns of bias, these must be disclosed (>DFG guideline 16). If necessary, the expert opinion must be waived after clarification of justified doubts by notification and consultation with the responsible persons as well as actual bias. The review must be waived in cases of justifiable non-expertise in the respective field. Reviews must not be delayed without a justifiable reason. Reviews should promote comprehensible research. This may include requiring documentation of methods and research data, if possible according to FAIR principles.

Researchers who take on the function of editors carefully consider for which publication media they take on this task (> DFG guideline 15). Journal editors take into account the requirements of high-quality science through rigorous peer review processes.

8. Performance and evaluation criteria of scientists (> DFG guideline 5)

A multidimensional approach is required for the evaluation of the performance of scientists, which can take place in different situations and career stages (e.g. during recruitment, takeover into permanent employment, in the annual appraisal interview, etc.). In addition to scientific performance, other aspects should be taken into account. The evaluation of performance primarily follows qualitative standards. Quantitative indicators should only be included in a differentiated and reflected manner. In addition to the discipline-specific criteria, other performance dimensions are also included in the assessment, e.g. commitment to teaching and training, acquisition of third-party funds, knowledge and technology transfer, public relations work as well as contributions in the interest of society as a whole. The scientific attitudes, such as an openness to knowledge and a willingness to take risks, should also be included.

Where indicated, individual peculiarities in CVs – in addition to the categories of the General Equal Treatment Act – are also included in the judgement. Personally determined peculiarities in career paths, e.g. extended periods of training and qualification due to family or health-related absences and alternative career paths, are appropriately taken into account (>DFG guideline 5). For

personnel selection, mandatory further training courses are regularly offered for managers at UFZ and a guideline is provided.

9. Dealing with conflicts of interest (>DFG guideline 8)

In order to prevent conflicts of interest among researchers, the roles and responsibilities of all those involved in a research project should be agreed upon and made clear from the beginning, and the exchange on this between the participants should also be continued during the research process. Roles and responsibilities are defined in an appropriate manner and, if necessary, adjusted (>DFG guideline 8). In order to prevent conflicts due to hierarchical relationships, the participants are guided by the UFZ guidelines on doctoral supervision, good leadership and the agreement on the promotion of equal opportunities, as well as the principles on the responsible handling of research data.

In the context of collaborations with external partners, there are areas of conflict due to the collision of scientific interests with political, economic or financial interests, e.g. due to the practice of applying for property rights (patents) or the confidentiality of unpublished data. Expert or advisory side activities can also lead to conflicts. Cooperation with private-sector partners must therefore be designed and practised as equal partnerships. Economic considerations must not take precedence over academic freedom. In the case of research projects in cooperation with external partners, the rights of use must be contractually regulated during project planning in consultation with UFZ's legal department.

In order to prevent conflicts of interest, all persons involved in a research project must disclose their financial and other interests and connections to their superiors or responsible bodies at the beginning of the project, insofar as they could conflict with their research activities. In addition, care must be taken to ensure a strict separation of personnel between management responsibilities at UFZ and management activities in a company (e.g. spin-offs, see UFZ guideline "Further principles for supporting UFZ staff in founding companies").

10. Suspected cases of scientific misconduct: Whistle-blowers and those affected by allegations (>DFG guideline 18)

One problem with scientific misconduct is that violations are not always known or followed up by the scientific community. Scientists are often reluctant to make their suspicions of scientific misconduct known for fear of reprisal, bullying or exclusion and isolation. In turn, younger scientists in particular are sometimes not taken seriously by superiors when voicing suspicions of scientific misconduct. UFZ is trying to counteract this with this regulation. Justified whistle-blowing is not denunciation or group-damaging behaviour, but a necessary step in the face of suspicions of violations of research ethics' principles. Whistle-blowers who voice a justified suspicion are not the ones who harm colleagues or UFZ, but the person who commits the misconduct. Whistle-blowers are protected in their anonymity as far as possible in the preliminary examination and investigation procedures, as described below. Particular attention shall be paid to the protection of junior researchers. Whistle-blowers, in particular junior researchers, should not suffer any disadvantages for their own scientific or professional advancement as a result of reporting misconduct, even in the case of unproven scientific misconduct and insofar as the reporting of the allegations has not demonstrably been made against better knowledge. Likewise, persons who are accused of scientific misconduct are to be protected – as a basic assumption, the presumption of innocence applies first.

Indications of scientific misconduct may only be made in the case of reasonable suspicion. Deliberately false or wilful accusations may themselves constitute scientific misconduct.

Before the name of the person providing the information is disclosed, the whistle-blower must be informed and asked to decide whether they will withdraw the complaint if the name is likely to be disclosed.

Anonymous tips will also be checked if the person providing the tip provides reliable and sufficiently concrete facts.

11. Ombudspersons (>DFG guideline 6)

As contact persons for all questions regarding good scientific practice as well as scientific misconduct, at least two neutral, qualified ombudspersons with personal integrity (if possible, one man and one woman each) are elected by the members of the Scientific and Technical Council (WTR) for a term of four years. A maximum of one further term of office is possible. For the performance of this task, they are otherwise released by the Executive Management of UFZ (>DFG guideline 6) and receive the necessary substantive support and acceptance. Ombudspersons are not bound by instructions in their activities. For support, they can contact the central ombudsperson of the Helmholtz Association or the DFG committee “The German Research Ombudsman”.

a) Election

All members of the Scientific and Technical Council of UFZ are actively eligible to elect the ombudspersons by majority vote. All scientific staff members who have been employed by UFZ for at least six months are eligible to be elected. Members of the scientific management and their staff units as well as heads of departments are not eligible to be elected, as the purpose of the ombudsperson is to provide a point of contact independent of UFZ management. The aim is to elect scientists with a permanent contract in order to give them the maximum possible independence and, at the same time, continuity in personnel. They should also not hold any other positions that could possibly lead to a conflict of interest, such as membership in the works council. The ombudspersons should also have management experience and experience in the training of young academics, as well as be familiar with the implementation of research projects – also in an international context. In addition, it is desirable that the ombudspersons come from departments that are thematically as far apart as possible.

The elected ombudsperson(s) shall be made known in an appropriate manner.

b) Tasks

In particular, the ombudspersons have the task of being available to the parties involved as a confidential and advisory contact in the event of a suspected breach of the principles of good scientific practice or a conflict for this reason. They shall, as far as possible, contribute to solution-oriented conflict mediation. In the event of a suspected case, they will proceed as described in Part B and conduct a preliminary examination. In addition, the ombudspersons observe the general development and identify problem areas that may give rise to scientific misconduct and make suggestions, e.g. for prevention, to the management via WTR. The ombudspersons of UFZ cooperate in the network of ombudspersons of the Helmholtz Association. From the network, an ombudsperson is appointed as spokesperson who supports the central ombudsperson and can represent them at appointments.

c) Duty of confidentiality

The ombudspersons treat all enquiries and information brought to their attention during discussions about possible misconduct as confidential. They are not obliged to disclose this information to the UFZ management. Information to the Executive Management and the respective head of department is provided with the ombudsperson's report after examination of the suspected case (preliminary examination), if the allegation/suspicion could not be dispelled with overwhelming probability or the conflict could not be resolved. Disclosure requires the consent of the person providing the information, unless the information was provided anonymously. If an investigation procedure is initiated, the WTR board is informed and instructed by the Executive Management to set up an investigation committee to formally investigate the allegation of scientific misconduct.

d) Reporting obligation

The ombudspersons shall report to WTR and the Executive Management of UFZ on their work once a year in anonymised form.

Part B: Regulations for initiating an investigation procedure in cases of alleged research misconduct (>DFG guideline 19)

It is part of the scientific ethics and the self-image of the scientific staff working at UFZ not to tolerate their own scientific misconduct and that of other employees.

The usual procedure in cases of suspected misconduct should be to address the possible misconduct in a direct, personal conversation with the person causing it and to seek clarification and, if necessary, correction or to clarify it with the help of the usual instruments of personnel management.

If a solution cannot be found through these channels and a suspicion or allegation of scientific misconduct arises against a person working at UFZ (hereinafter referred to as the person concerned), the ombudsperson must be informed. The investigation procedure for scientific misconduct as performed at UFZ is described below.

The procedure for determining whether scientific misconduct has occurred is divided into two parts:

- the preliminary examination procedure
- the formal investigation procedure

Attempts to reach an amicable settlement will be expressly supported in both proceedings, insofar as this is objectively justified.

An ombudsperson may be rejected due to concern of bias if there is a reason to distrust their impartiality. In this case, the other ombudsperson is entrusted with the case. If the other ombudsperson is also deemed to be biased, the case can be passed on to the central ombudsperson of the Helmholtz Association or to the “German Research Ombudsman” appointed by the German Research Foundation (DFG). In principle, there is the right of choice to consult a local ombudsperson of UFZ, the central Helmholtz ombudsperson or the “German Research Ombudsman”. The right of application is available to the person concerned, the person whose rights have been violated and the ombudsperson themselves at any time during the proceedings, however, one case will not be dealt with simultaneously by the UFZ ombudsperson, the Helmholtz ombudsperson or the “German Research Ombudsman”.

I. Preliminary examination

- (1) In the event of concrete suspicions of scientific misconduct within the meaning of the catalogue of conduct ([Appendix 1](#)), one of the ombudspersons must be informed immediately. The information can be given in writing or orally; in the case of oral information, the ombudsperson will record a written note. Information can be given by people working at UFZ as well as by external persons if they suspect a person working at UFZ of scientific misconduct or are suspected themselves as a person working at UFZ.
- (2) The ombudsperson documents the facts, evidence and name of the person providing the information and the person concerned in an appropriate manner. Anonymous information is also possible. The ombudsperson, which is approached in individual cases, advises as a person of trust those who inform them about a concretely suspected misconduct. In doing so, the ombudspersons are committed to the basic principle of the presumption of innocence. The ombudsperson treats the name of the informant confidentially and does not disclose it to third parties without appropriate consent. Before the name of the whistle-blower is disclosed, the person will be informed immediately; the whistle-blower can decide whether to withdraw the complaint if their name is likely to be disclosed.
- (3) The work of the ombudspersons is based on the goal of mediating between the parties involved in the proceedings, insofar as this is possible and objectively justified. The ombudsperson informs the person affected by the suspicion of misconduct at the earliest possible time about the content of the allegation of scientific misconduct and its evidence or

the status of the proceedings. The person concerned shall be given the opportunity to comment within a maximum period of two weeks. The name of the person providing the information shall not be disclosed to the person concerned without their consent. After receipt of the statement of the person concerned or after expiry of the set deadline, the ombudsperson will carry out further clarification measures within the scope of the preliminary examination, if necessary. They clarify the facts of the case and examine the allegations under plausibility aspects for concreteness and significance, for possible motives and with a view to clearing up the allegations. In order to clarify the facts and with the aim of mediating a conflict, the ombudsperson can hold talks with the persons involved and, if necessary, with advisors of their choice. For example, the central ombudsperson of the Helmholtz Association can be consulted in an advisory capacity in difficult cases. In well-founded cases, the UFZ ombudsperson can transfer an investigation to the central ombudsperson of the Helmholtz Association, provided that the whistle-blower agrees, for example in the case of personal bias on the part of the UFZ ombudspersons, involvement of several Helmholtz Centres or the management level of UFZ. In principle, confidentiality and the presumption of innocence are respected in all steps.

- a) If further clarification measures and mediation efforts have been completed or are not necessary, the preliminary proceedings will be terminated without a report in the positive case, insofar as the suspicion is not sufficiently confirmed or the unfoundedness of the allegations has been proven or the conflict could be settled. The person affected by the allegations and the person providing the information shall be given the opportunity to comment at every stage of the proceedings.
 - b) If the preliminary examination has confirmed the existence of sufficiently concrete suspicions of misconduct without at the same time proving misconduct, the ombudsperson shall forward the results of the preliminary examination procedure with their report to the Executive Management and recommend that the preliminary procedure be transferred to the formal investigation procedure.
 - c) If misconduct has already been proven on the basis of the results of the preliminary examination, the ombudsperson makes a recommendation for further action with their report and concludes the preliminary proceedings.
- (4) The final report of the ombudsperson on the result of the preliminary examination procedure contains the facts of the case and the evidence as well as the result of the preliminary examination with the supporting reasons. The person providing the information is only to be disclosed if the person concerned cannot otherwise defend themselves properly or if the credibility or the motives of the person providing the information are to be examined. This report shall be made available in writing to the Executive Management and the respective head of the scientific department and, upon request, to the person giving the information.
 - (5) Until culpable misconduct has been proven or the conflict has been resolved – i.e. even after the preliminary examination has been completed – information about the parties to the proceedings and the findings of the preliminary examination must be kept strictly confidential.
 - (6) The confidentiality of the proceedings is subject to restrictions if persons involved in the proceedings approach the public with their suspicions. The investigating body decides, on a case-by-case basis, how to deal with the breach of confidentiality by these person(s).
 - (7) The Executive Management can take all necessary steps to meet labour law deadlines and, if necessary, inform the relevant departments and the General Works Council.

II. Formal investigation

The Executive Management initiates the formal investigation procedure – if necessary after consultation with the WTR board – by instructing the WTR board to set up a committee of enquiry to formally investigate the allegation of scientific misconduct.

1. Composition of the Committee of Enquiry

- (1) The Committee of Enquiry consists of a first chairperson, a deputy and at least three advisory persons.
- (2) Suitable candidates for the first chairperson and their deputy are proposed by WTR members and elected by WTR for four years by majority vote. Re-election is possible. The first chairperson convenes and chairs the meetings.
- (3) The members of WTR are eligible to vote. Scientists external to UFZ are eligible to be elected.
- (4) The advisory persons are appointed on a case-by-case basis by the elected first chairperson together with their deputy. They are recruited from the research field of UFZ and should preferably belong to different scientific disciplines and not work directly with the person concerned.
- (5) The members of the Committee of Enquiry should not have any other functions that could lead to a conflict of interest, such as membership in the General Works Council, in the Executive Management or being a line manager or subordinate of the person concerned.

2. Bias of the members of the Committee of Enquiry

The challenge on grounds of bias against a member of the Committee of Enquiry shall be addressed to the committee itself, which shall decide on it in the absence of the member accused of bias.

If bias is established, the biased member shall be excluded from the committee for this investigation. In case of partiality of the first chairperson, their deputy shall take their place. If an advisory person is affected, the first chairperson shall appoint another suitable person.

3. Procedural regulation of the Committee of Enquiry

- (1) The Committee of Enquiry receives the mandate to investigate a case from the Executive Management via the WTR board, with the ombudsperson's report on the preliminary examination. The Committee of Enquiry deliberates in non-public oral proceedings. It examines in free assessment of evidence whether scientific misconduct has occurred. It is entitled to take all steps necessary to clarify the facts. To this end, it may obtain all necessary information and statements and, in individual cases, also consult experts from the scientific field concerned. The person affected by possible misconduct shall be given an appropriate opportunity to make a statement. The deadline for commenting is usually two weeks from the date of information by the Committee of Enquiry. The person shall be heard orally at their request. For this purpose, they may call in a person of their confidence as an adviser; the latter also applies to other persons to be heard.
- (2) The name of the person providing the information shall only be disclosed if the person concerned cannot otherwise properly defend themselves, in particular because the credibility of the person providing the information is essential for establishing the misconduct.

- (3) The Committee of Enquiry has a quorum if at least four members are present. Resolutions of the Committee of Enquiry shall be passed by simple majority. In the event of a tie, the vote of the first chairperson shall be decisive.
- (4) The completion of the entire procedure is ensured most timely. The necessary steps will be taken to complete each stage of the procedure within a reasonable period of time, i.e. without culpable delay.
- (5) At the end of the hearing procedure, the Committee of Enquiry shall take one of the following decisions:
 - a) The proceedings are discontinued because the suspicion has not been sufficiently confirmed or has proven to be groundless.
 - b) The proceedings are discontinued because the possibility of clearing up the allegations with the participation of the person providing the information and the person concerned has arisen in the course of the proceedings and intervention on account of scientific misconduct is not (or no longer) necessary.
 - c) The proceedings shall be discontinued due to scientific misconduct in a less serious case. The Committee of Enquiry may make the discontinuation dependent on the fulfilment of conditions.
 - d) The procedure is submitted to the Executive Management with a final report due to proven scientific misconduct. The final report contains the facts of the case, the evidence, the outcome and proposals for action (Annex 2).
- (6) The Executive Management takes the final decision on the measures to be initiated.
- (7) The final, essential reasons for the Executive Management's decision are to be communicated in writing without delay to the person concerned, the management of the scientific organisational unit, the WTR board and the ombudsperson who carried out the preliminary examination, as well as, upon their request, to the person providing the information.
- (8) In the case of discontinuation of the procedure according to paragraph 5. a–c, the result shall be made available for inspection by anyone or published on the intranet at the request of the person concerned two weeks after the final decision and information of the person concerned.

Annex 1: Catalogue of conduct to be considered as academic misconduct

Scientific misconduct is deemed to have occurred if, in a context relevant to science, false statements are made intentionally or through gross negligence, the recognised rules of authorship are violated, the intellectual property of others is infringed or their research activities are impaired in some other way. In particular, own misconduct may be considered:

False declarations

1. The invention of data
2. The falsification of data, e.g.
 - a) by selecting and rejecting unwanted results without disclosing this
 - b) by manipulating a representation or illustration
3. Incorrect information in a letter of application or a grant application (including false information on the publication medium and on publications in print)

Infringement of intellectual property rights

4. With regard to copyrighted works created by others or substantial scientific knowledge, hypotheses, doctrines or research approaches originating from others,
 - a) the unauthorised exploitation under presumption of authorship (plagiarism)
 - b) the exploitation of research approaches and ideas, especially as a reviewer (theft of ideas) ([> DFG guideline 16](#))
 - c) the presumption or unsubstantiated assumption of scientific authorship or co-authorship
 - d) the falsification of the content
 - e) unauthorised publication and unauthorised making available to third parties as long as the work, finding, hypothesis, teaching or research approach has not yet been published
5. Claiming the (co-)authorship of another person without that person's consent

Interference with the research activities of others

6. Sabotaging research activities (including damaging, destroying or tampering with experimental set-ups, equipment, records, hardware, software, chemicals or other things needed by another person to conduct an experiment)
7. The elimination of primary data if this violates legal provisions or discipline-related recognised principles of scientific work

Joint responsibility for the scientific misconduct of others can arise, for example, through:

- active participation in the misconduct of others;
- knowing and tolerating the misbehaviour of others;
- knowingly co-authoring publications containing forgeries; or
- gross neglect of the duty of supervision.

The circumstances of each individual case are ultimately decisive.

Annex 2: Catalogue of possible measures and consequences in case of scientific misconduct

The following catalogue of possible sanctions or consequences for scientific misconduct is – without claiming to be exhaustive – to be understood as an initial guide. Since each case is likely to be different and the severity of the scientific misconduct found also plays a role, there is no uniform guideline of adequate reactions; these rather depend on the circumstances of the individual case.

The Human Resources Department and the Legal Department are available for consultation.

1. Consequences under labour law

Since in cases of scientific misconduct at UFZ a person concerned may be an employee of UFZ, consequences under labour law should always be examined first.

- (1) **Formal warning**
The formal warning – to be made in writing and included in the personnel file – is a preliminary step to dismissal and is therefore only considered in cases of minor scientific misconduct in which dismissal is not yet to take place.
- (2) **Dismissal**
Dismissal requires that, under the circumstances of the individual case and after weighing the interests of both parties to the contract, the continuation of the employment relationship cannot reasonably be expected. In serious cases of scientific misconduct, this is likely to be the case for the employment relationship between UFZ and an employed scientific staff member.
- (3) **Contract termination**
Besides dismissal with or without notice, the possibility of terminating the employment relationship by amicable contract termination should be considered.
- (4) **Special aspects for employment contracts similar to civil service contracts**
In the case of scientists with whom UFZ has concluded a contract of employment similar to civil service law, the civil service law applicable to comparable university teachers at federal level shall apply accordingly. It can be assumed that serious scientific misconduct constitutes a reason that can lead to removal from service under federal civil service law and therefore justifies dismissal of this employee.

2. Academic consequences

Academic consequences in the form of the revocation of academic degrees cannot be issued by UFZ itself, but only by the entities that awarded these degrees, usually the universities. These must be informed of serious scientific misconduct if it was connected with the acquisition of an academic qualification.

In particular, the following can be considered:

- (1) Revocation of the doctoral degree respectively,
- (2) Revocation of the authorisation to teach

3. Consequences under civil law

The following civil law consequences may have to be considered:

- (1) Issuance of a ban on entering UFZ premises
- (2) Claims for restitution against the person concerned, for example for the return of stolen scientific material or the like
- (3) Claims for removal and injunctive relief under copyright law, personality law, patent law and competition law

- (4) Claims for repayment, for example of scholarships, third-party funds or the like
- (5) Claims for damages by UFZ or by third parties in the event of personal injury, property damage or the like

4. Criminal law consequences

Criminal law consequences always come into consideration if there is a suspicion that scientific misconduct simultaneously fulfils an offence under the German Criminal Code (*Strafgesetzbuch – StGB*) or other criminal norms or administrative offences.

If investigating authorities are involved, the Executive Management must always be informed. Coordination is recommended.

Possible offences include:

- (1) Violation of personal sphere/secret sphere
 - § 202a StGB: Data espionage
 - § 204 StGB: Exploitation of another's secrets
- (2) Offences against life and bodily harm
 - § 222 StGB: Negligent killing
 - §§ 223, 229 StGB: Intentional or negligent bodily harm
- (3) Property offences
 - § 242 StGB: Theft
 - § 246 StGB: Misappropriation
 - § 263 StGB: Fraud
 - § 264 StGB: Subsidy fraud
 - § 266 StGB: Embezzlement
- (4) Forgery of documents
 - § 267 StGB: Forgery of documents
 - § 268 StGB: Forgery of technical records
- (5) Damage to property
 - § 303 StGB: Criminal damage
 - § 303a StGB: Data manipulation
- (6) Copyright infringements
 - § 106 Copyright Act: Unauthorised exploitation of copyrighted works

5. Revocation of scientific publications/information to the public and/or press

Scientific publications that are erroneous due to scientific misconduct must be revoked if they are still unpublished, and corrected if they have been published (revocation).

Cooperation partners are to be informed in an appropriate form, if necessary. In principle, the authors and editors involved are obliged to do so; if they do not take action, UFZ will initiate the appropriate measures that it is able to.

In cases of serious scientific misconduct, UFZ informs other research institutions or scientific organisations concerned. In justified cases, it may also be appropriate to inform professional organisations.

UFZ may be obliged to inform affected third parties and the public in order to protect third parties, to maintain confidence in scientific honesty, to restore its scientific reputation, to prevent consequential damage and in the general public interest.