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Guidelines for Safeguarding Good Scientific Practice (GSP) and Procedures for Scientific Misconduct

(version certified by the Members' Assembly of the Helmholtz Association
and reviewed by the German Research Foundation, dated July 30, 2022)

Preamble

The Helmholtz Association is aware of its responsibility for scientific integrity. This forms an essential basis for science and is an essential prerequisite for the confidence society places in scientific results. As an association of research centers, Helmholtz is committed to upholding shared basic standards of good scientific practice. The Helmholtz Association's guidelines for safeguarding good scientific practice and its misconduct investigation procedures have been revised with the goal of aligning them with the current code of the German Research Foundation (DFG)* and its guidelines as well as the associated clarifications, keeping pace with the changes digitalization is causing in research, and defining the tasks of the Central Ombudsperson in the Helmholtz Association.

The Helmholtz Centers are legally independent and establish their own guidelines for implementing the DFG code for good scientific practice and misconduct investigation procedures. These guidelines are definitive in the implementation of the DFG code at the Centers. In the following guidelines, the Helmholtz Association sets out a basic framework for the responsibility it bears as regards complying with principles of good scientific practice, common goals, and key tasks. These guidelines are aligned with the revised DFG code and, to this end, take into account the specific features of the Helmholtz Association and the autonomy of the individual Helmholtz Centers. The detailed implementation of the DFG code takes into consideration the specific characteristics of the disciplines in the Centers' research fields. In cases where individual provisions of this guideline do not refer to the DFG code in its specific form, reference is made to the corresponding guidelines of the code.

The Helmholtz Association coordinates and manages questions that are of fundamental importance to good scientific practice as part of the tasks set out in its statutes. Responsibilities of the Association include organizing central training sessions to provide initial and ongoing training for ombudspersons and continuously developing the principles for safeguarding good scientific practice from a strategic perspective, taking into account the responsibility for young scientists in particular. The Helmholtz Association appoints a Central Ombudsperson who works independently to provide advice to the President of the Helmholtz Association and the Helmholtz Centers and takes on key tasks of the Helmholtz Association relating to good scientific practice. This individual can also play a role in situations where a number of Centers are involved or the management and/or the ombudspersons of the relevant Center have a bias or are affected by the relevant case. The Central Ombudsperson acts as a key interface to the Ombuds Committee for scientific integrity in Germany.

All members of the Helmholtz Association uphold the principles contained in these guidelines.

* cf. DFG code dated September 2019: https://www.dfg.de/en/research_funding/principles_dfg_funding/good_scientific_practice/index.html

General principles and professional ethos

Good scientific practice is the foundation of the Helmholtz Association's research activities. This is characterized by the fact that scientific information is always stated in a correct and transparent manner, intellectual property is protected, and research activities pursued by others are not compromised. Good scientific practice thus comprises the ethical principles of scientific exchange, promoting young scientists, ensuring transparent research processes, the publication and accessibility of scientific data, and clearly structured and defined procedures for addressing suspected cases of scientific misconduct.

Each Helmholtz Center has its own guidelines for good scientific practice and committees and procedures to address violations of good scientific practice. These rules apply to all employees* and promote a culture in which every individual is required to uphold the rules of good scientific practice. For this reason, principles of good scientific practice are to be a matter of common knowledge and to play a key role in the integration, promotion, and advanced training of employees at every stage of their careers.

The scientific excellence of the Helmholtz Centers and thus of the Helmholtz Association as a whole can be attributed to the dedicated, professional collaboration shared by its scientific and non-scientific staff. This cooperation transcends disciplines and individual remits with the goal of finding answers to the issues facing academia, business, and society. Managers, supervisors, and evaluators have a special responsibility in this and serve as role models when it comes to imparting and safeguarding good scientific practice. These individuals are obliged to maintain confidentiality when working on committees and evaluating others and are required to immediately clarify any conflicts of interest and biases and report these to the relevant offices. Young scientists also bear responsibility and need special protection against misconduct as well as attention and guidance for matters relating to good scientific practice at the individual Helmholtz Centers.

Management of scientific institutions have an organizational responsibility

The President of the Helmholtz Association and the directors of the Helmholtz Centers establish the general conditions for excellent research work. Together with senior employees at the Helmholtz Centers, they ensure that legal and ethical standards are maintained and that there are no incentive structures which could encourage scientific misconduct. In particular, their activities include:

* This group of persons not only includes employees with a work contract at a Helmholtz Center but also e.g. guests or scientists holding fellowships.

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- Transparent written procedures specifying contact persons and clear rules for supervision, quality assurance, and conflict handling
- Fixed guidelines or principles for recruiting and developing personnel and setting up and implementing guidelines and standards for Helmholtz as a whole
- Promoting young scientists through ongoing and advanced training and by establishing suitable support structures to prevent an abuse of power
- Career advancement activities in the form of advisory services and opportunities for advanced training
- Mentoring for all employees
- Implementing an inclusive culture that is sensitive to diversity and taking an unbiased approach to nurturing talent

Central Ombudsperson at Helmholtz

At the suggestion of the President, the Members' Assembly appoints an external, experienced scientist of integrity to serve as the independent Central Ombudsperson. This individual cannot be a member of any management committees of the Helmholtz Association or any of its Research Centers. The Central Ombudsperson is appointed for a period of four years. They may be appointed to another term in office.

The Members' Assembly appoints the speaker of the network of ombudspersons as the deputy for the Central Ombudsperson in the event that this individual is prevented from carrying out their duties or there is an appearance of bias.

One aspect of the Central Ombudsperson's duties consists of working to uphold the rules and principles of good scientific practice with mediation as the objective. In addition, they provide support and advice to the ombudspersons of the Centers if needed in cases involving a violation of good scientific practice or scientific misconduct.

All Helmholtz Centers are informed of the Central Ombudsperson and their duties. They help to resolve conflicts in a solution-oriented manner based on regular communication with the network of ombudspersons. In addition, they serve as a neutral entity in matters relating to good scientific practice.

The Central Ombudsperson meets with the President and the Members' Assembly for a discussion at least once a year and, in particular, reports on current and strategic topics. This includes presenting the number and type of queries and processed cases in anonymized form.

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The Central Ombudsperson maintains confidentiality when carrying out their duties. Biases can be asserted both by the Central Ombudsperson themselves and by the person accused. A deputy is appointed in this case.

Performance parameters and evaluation criteria

Researchers and their results are evaluated according to scientific criteria first and foremost.

The quality and originality of the research are always the top performance and evaluation criteria, particularly in the context of conferring academic degrees, examinations, appointments and hirings, promotions, and the allocations of funds.

The following additional evaluation criteria are to be taken into consideration in addition to research performance:

To a large extent:

- Openness to results and findings as the fundamental principle of scientific research
- Involvement in the transfer of knowledge and technology
- Consideration given to scientific contributions and reviewed publications in the community context with reference to major issues facing society, science, and economy
- Guaranteeing permanent, open, and
- Barrier-free accessibility and re-usability of published research results

As well as

- Services for the wider scientific community
- Commitment to the Helmholtz Association and Helmholtz Centers
- Personal (health, family, and social) factors

Research process

The Helmholtz Association is dedicated to scientific autonomy and research freedom in keeping with the long-term research goals it pursues on behalf of the state and society. This aim can only be met if the Association's scientists carry out their

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activities in a responsible manner. Every substep in the research process is performed *lege artis*, including appropriate measures for quality assurance and documentation. In particular, this involves the aspects and rules of research design, the research methods and documentation, reusability, the publications, and research data management.

Research design

A thorough search for previous research work is required in order to identify the research questions and plan a project. Scientists take into consideration rights and duties established in legal provisions and in contracts with third parties. They consider aspects around sustainability in planning their research and avoid unnecessary consumption of energy and materials. Where necessary, they obtain and present approvals and ethics votes. The roles and responsibilities of all scientific personnel participating in a research project are clearly defined, along with those of individuals playing an ancillary role in the research, and agreements regarding the usage rights of research data and research results are documented. Scientists who evaluate submitted manuscripts, funding applications, and the credentials of individuals are required to maintain strict confidentiality in relation to these. They disclose all facts that could justify concerns of individual bias. The requirement to maintain confidentiality and disclose facts that could raise concerns regarding biases also applies to members of the scientific advisory and decision-making committees. The legitimacy of the process of forming a judgment rests on trustworthy conduct.

Research methods and documentation

The methods used are scientifically substantiated and transparent. Particular priority is given to quality assurance and establishing standards in the development and application of new methods. All information relevant to the research results is to be documented in a form that is suitable for review and evaluation. All individual results are documented and made publicly available as a matter of principle, including those that do not support research hypotheses. Deviations from these requirements must be presented in a transparent manner. Research results and documentation are to be protected against manipulation as effectively as possible.

Publications, authorship, and research data management

All research results are to be made permanently accessible and usable for public/scientific discourse as a matter of principle. This also includes the research data, materials, and information on which the results are based as well as the software that was

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used. Software that the researchers program themselves is made publicly accessible, indicating the source code. In certain cases, there may be justified reasons for making data and information accessible on a restricted basis only (e.g., contractual obligations or patent applications). It is the responsibility of the researchers to decide whether, how, when, and where they publish their results, in keeping with standard practices in the relevant field. They avoid the inappropriately fragmented publication of research results. Research data and results that have been made publicly accessible and the underlying information and research software used are to be stored in a secure and accessible manner in the institution where they were produced or in repositories spanning a number of sites in keeping with current standards of good practice for long-term archiving. The relevant Helmholtz Center ensures that the required archiving infrastructure is in place. In the case of collaborations involving special agreements regarding publications, the relevant rules regarding the publication and archiving of the data from the collaboration are to be applied.

Individuals who made a genuine, documented scientific contribution to the content of a text, data, or software publication are considered to be authors of these publications. All authors approve the final version of the publication, and they are jointly responsible for it. Authors work carefully to select the publication medium based on its quality and visibility in the respective field of discourse, ensuring that the publication will be freely available for subsequent use. They make sure published research results are identified such that they can be correctly cited by third parties. Preliminary work carried out in-house and by third parties is documented in full.

The Helmholtz Association is committed to upholding the FAIR (findable, accessible, interoperable, reusable) principles when dealing with research data, information, and software as the key elements of good research practice. It recognizes the important role played by digital archiving of research findings and strives to ensure that these findings can be reused on a permanent basis.

Procedures for suspected cases of scientific misconduct

In cases where a breach of good scientific practice or scientific misconduct are suspected, these allegations are to be dealt with as a matter of priority by the ombudspersons at the respective Helmholtz Center in accordance with the rules of procedure in place there. The Central Ombudsperson can be involved in an advisory role where needed.

In duly justified cases, the ombudspersons of a Helmholtz Center or other relevant offices can decide to hand an investigation over to the Central Ombudsperson, provided that the individual making the report agrees to this approach. An approach of this type

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is appropriate or necessary, for example where bias exists on the part of all ombudspersons at the Center, several Helmholtz Centers are involved, or the management level of the Center is affected. All ombudspersons maintain confidentiality when deliberating relevant cases as a matter of principle.

The Central Ombudsperson, as well as the Ombuds Committee for scientific integrity in Germany, can also always be contacted directly by individuals making reports, those affected by accusations, or even anonymously. In this case, individuals making a report must provide a comprehensible explanation as to why the case could not be handled at the decentralized level. Provided that the case at hand does not meet the criteria specified above and there are no significant reasons to the contrary, the Central Ombudsperson, in consultation with the individual making the report, will delegate the process at the level of the respective Helmholtz Center for further clarification. The formal handling of a case may only be assigned to a single body, i.e., either at the respective Helmholtz Center, at central level, or the Ombuds Committee for scientific integrity in Germany.

Consideration should always be given to protecting individuals making reports (informants and whistleblowers) and those affected by accusations by maintaining confidentiality and the presumption of innocence. Reports of suspected breaches of good scientific practice must always be made in good faith. If the name of the individual who made the report is known, the office carrying out the investigation must treat their name confidentially and may not pass it on to third parties without their agreement. Exceptions only apply if there is a relevant legal obligation or if the accused will not be able to properly defend themselves otherwise. Individuals making reports and those who are unfairly accused are to be protected in cases of unproven instances of scientific misconduct as well, and they may not be placed at any disadvantage.

Principles of the central procedure for suspected cases of scientific misconduct at the Helmholtz Association level

If reports or procedurally relevant information relating to scientific misconduct is received by the Central Ombudsperson, these are formally reviewed and their receipt is confirmed.

In duly justified cases, the ombudspersons of a Helmholtz Center or other relevant offices can decide to hand an investigation over to the Central Ombudsperson, provided that the individual reporting the case agrees to this. An approach of this type is appropriate or necessary, for example where several Helmholtz Centers are involved or in cases where there is bias on the part of all ombudspersons or the management level of the Center, or they are affected by the report. In particular, the Central Ombudsperson looks at those cases in which a number of Centers are involved or the management(s)

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or ombudsperson(s) of the relevant Center(s) is/are biased or affected, provided no other process is in place at the Center(s).

If the matter at hand relates to suspected scientific misconduct, the Central Ombudsperson starts by reviewing the suspected case with the involvement of scientific or legal experts where applicable. Only once sufficient initial evidence has been established does the Central Ombudsperson inform the individual making the report, the accused, and the management of the involved Center (provided it is not the subject of the accusations) and submits a formal report regarding the appointment of a central committee of inquiry to the President. A refusal on the part of the President requires special justification, which is to be communicated to everyone involved. Confidentiality is maintained by the President and everyone involved.

The committee of inquiry to be formed by the President is to include at least three impartial individuals. The members are to possess relevant specialist expertise. One member is to be a fully qualified lawyer. Each affected Helmholtz Center is represented on the committee of inquiry by a member of its Scientific-Technical Council (STC) or a member of its executive team. Appointments are made by the affected Center(s). A designated member can decline to work on the committee for good cause. Individuals making reports can assert that there are biases on the part of the committee of inquiry. If a designated member cannot be appointed to the committee of inquiry because they are prevented from doing so, they decline the appointment for good cause, or there is an apparent bias, a different individual is appointed. If necessary, the committee of inquiry can involve external advisors or experts to consider the evidence. The Central Ombudsperson is a permanent guest of the committee of inquiry with a right to speak and submit motions. The President of the Helmholtz Association is not a member of the committee of inquiry. All required data and documents are to be made accessible to the committee of inquiry by the member institutions.

The committee of inquiry hears the accused individual and the person submitting the report and ascertains the context of the conduct that is the subject of the complaint. It freely considers the evidence in order to verify whether the case at hand represents scientific misconduct. Affected individuals as well as those submitting reports have an opportunity to make a statement in every stage of the procedure.

The consultations carried out by the committee of inquiry are not public and are subject to confidentiality. The principle of confidentiality continues to apply until scientific misconduct is proven in regard to those involved and the results. Biases can be asserted both by the Central Ombudsperson themselves and by the person accused. A representative is to be appointed in this case. A review by the committee of inquiry is to be conducted without delay and is always to be concluded within twelve months after the inaugural meeting of the committee of inquiry at the latest.

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The Central Ombudsperson of the Helmholtz Association works together with the ombuds-persons of all Centers to draft rules of procedure for the central committee of inquiry that come into force by decision of the Members' Assembly.

General provisions for concluding the procedures

The President is not informed by the Central Ombudsperson if the Central Ombudsperson did not find that a breach of good research practice occurred, or if it was possible to resolve a conflict amicably through the mediation of the Central Ombudsperson, or if the Central Ombudsperson did not find that a violation of good research practice occurred.

If a central committee of inquiry is appointed in cases of scientific misconduct, the committee develops a proposal for further measures as part of its report, where applicable after obtaining advice from the Ombuds Committee for scientific integrity in Germany.

In particular, the central committee of inquiry may recommend that the following measures be carried out against those affected if the committee finds evidence of intent or gross negligence:

- a) Withdrawal of the passive right to vote for committees of the Helmholtz Centers, either permanently or for a period of one to five years (depending on the severity of the scientific misconduct)
- b) Cease-and-desist orders, particularly the request to retract or correct publications
- c) Written reprimands

If the committee of inquiry finds that the scientific misconduct could result in the revocation of academic degrees, it forwards the case on to the awarding university or institution of higher education.

The committee of inquiry submits a written report to the President after the conclusion of the procedure.

The President informs the directors of the affected Center(s) regarding the conclusion and result of the procedures and regarding the recommended measures. It is the responsibility of the management(s) of the respective Center(s) affected to initiate any disciplinary actions or consequences under labor, civil, or criminal law.

The management(s) of the Center(s) report(s) to the President on the implementation of the measures proposed by the committee of inquiry.

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All individuals involved in the conflict are informed of the conclusion of the procedure in writing. Individuals submitting reports, the accused, and the management(s) of the affected Center(s) receive an explanation of the results of the investigation without infringement of personal rights.

The President reaches a decision regarding the notification of third parties and a potential publication of the resolutions in consultation with the directors of the affected Center(s), without infringement of personal rights and taking into account the legitimate interests of third parties.

