Rules of Good Scientific Practice

- adopted by the senate of the of the Max Planck Society
on November 24, 2000, amended on March 20, 2009 -

Scientific honesty and the observance of the principles of good scientific practice are essential in all scientific work which seeks to expand our knowledge and which is intended to earn respect from the public. The principles of good scientific practice can be violated in many ways – from a lack of care in the application of scientific methods or in documenting data, to serious scientific misconduct through deliberate falsification or deceit. All such violations are irreconcilable with the essence of science itself as a methodical, systematic process of research aimed at gaining knowledge based on verifiable results. Moreover they destroy public trust in the reliability of scientific results and they destroy the trust of scientists among themselves, which is an important requirement for scientific work today where cooperation and division of labor are the norm.

Although dishonesty in science cannot be fully prevented through sets of rules alone, appropriate precautions can nevertheless guarantee that all those involved in scientific activity are regularly made aware of the standards of good scientific practice. This is an important contribution to limiting scientific misconduct.

The basic rules of good scientific practice set out here take up the relevant recommendations of the Deutsche Forschungsgemeinschaft of January 1998 and adapt them to the research conditions at the Max Planck Society. They are binding on all persons active in research work at the Max Planck Society. For further information on the background and issues involved, please refer to the paper on "Verantwortliches Handeln in der Wissenschaft" (responsible practice in science) prepared by a working group of the Scientific Council of the Max Planck Society, and approved by the Senate of the Max Planck Society at its meeting of November 24, 2000. This text gives a detailed analysis of the conditions for and specific dangers to good, responsible scientific practice. It is also a plea for cooperation in the further development of the relevant recommendations.

1. General principles of scientific practice

The following regulations, over and above the provisions of national, European and international law, are to be observed as general principles of scientific research at the Max Planck Society:

a) General regulations governing scientific practice:

- precise observance of discipline-specific rules for acquiring, selecting and processing data,
- reliable securing and storage of primary data for 10 years; clear and comprehensible documentation of the methods employed (e.g. lab book) and all important results,
- the rule of systematic skepticism: openness to doubt, even about one's own results and about the results of one's own group. The test of a scientific result can be its reproducibility. The more surprising or the more hoped-for a result, the more important it is – within the bounds of reasonable cost and effort – to independently reproduce the means of achieving the result within the research group before communicating it externally,
- a realization of tacit, axiomatic assumptions; watchfulness for any "wishful thinking" motivated by self-interest or morals; systematic alertness to any possible misinterpretations as a consequence of the methodically limited ascertainability of the object of research (over-generalization).

b) Regulations governing relations with colleagues and cooperation:

- no hindrance of the scientific work of others,
- active promotion of junior scientists' scientific qualifications,
- openness to criticism and doubt expressed by other scientists and team colleagues.

c) Regulations governing the publication of results:

- publication on principle of research results (principle of the public availability of the results of research),
- appropriate correction of published mistakes,
- fair evaluation and citation of any literature used,
- honesty in the recognition of the contributions of colleagues,
- making of research results achieved with public funds freely available wherever possible.

d) Regulations governing proper review processes:

- careful, altruistic and impartial appraisal of colleagues,
- no delaying of reviews,
- no performance of biased appraisals,
- no performance of an appraisal where there is a suspected or actual conflict of interests.

e) Observation of the Max Planck Society's special, internal regulations:

- for example on security and defense research, on spinoffs, on dealing with conflicts of interest,
- with respect to the types and consequences of scientific misconduct, please refer to the rules of procedure in case of suspicion of scientific misconduct in the version adopted by the Senate on November 24, 2000, in particular.

2. Cooperation and leadership responsibility within working groups

The head of each institute or research establishment is responsible for a proper organization which ensures clear allocation, depending on the size of the individual scientific working units, of the tasks of leadership, monitoring, conflict resolution and quality control and guarantees that these tasks can in fact be undertaken.

Cooperation in scientific working groups must be organized in such a way that the results achieved in specialized areas within the particular undertaking can be reciprocally aired, criticized and integrated into the general body of knowledge, regardless of any considerations of hierarchy. This is also of particular significance for training junior scientists in the group towards independence. In larger groups a regulated form of organization is recommended, e.g. through regular colloquiums. Reciprocal checking of results is to be assured, even if this entails making one's own results accessible.

Leadership roles in working groups can only be performed responsibly in the full knowledge of all relevant circumstances; the leadership of a working group demands expertise in the field, presence and a broad perspective. Where this may no longer be possible to the desired level because of the size of the group or for other reasons, the leadership functions must be delegated in such a way that the leadership division remains manageable.

3. Guidance for junior scientists

Particular attention should be given to the training and furthering of junior scientists and to guiding them in the observance of the principles of good scientific practice. Junior scientists should be informed of the rules of good scientific practice and the consequences of scientific misconduct through regular training sessions. Attention is drawn here to the special significance of good cooperation with the universities in this context.

In the departments and working groups at the institutes and research establishments of the Max Planck Society, appropriate care should be taken of junior scientists, in particular of undergraduate diploma candidates and doctoral students and younger postdocs and those writing theses to qualify as university lecturers. Primary contact persons should be in place for these junior scientists. In the case of doctoral students it is recommended that in addition to the primary contact person, two other experienced scientists also be involved in their guidance. Appropriate cooperation with the university at which the candidate is to take the doctorate should also be ensured (Thesis Committee).

4. Securing and storing primary data

Primary data as a basis for publications must, as far as possible, be stored for at least ten years on durable, secure carriers in the institutes or research establishments in which they arose. Either the institute or the central organization must ensure that data remains readable for at least this length of time. Access to the data has to be granted for persons with a justifiable interest.

Scientific examinations, experiments and numerical calculations can only be reproduced or reconstructed if all the important steps are comprehensible. For this reason, full and adequate reports are necessary, and these reports must be kept for a minimum period of ten years, not least as a source of reference, should the published results be called into question by others.

The institute management is responsible for regulating – in a manner suited to the institute's scientific orientation – and setting out in writing all further details and responsibilities, in particular for detailing proper reporting standards and access regulations for the use of data.

Governments and industry within the OECD have brought in a set of guidelines on quality assurance, known as GLP (good lab practice), in the interests of improving quality and safety in health-relevant and environment-related areas of production.

While it does not appear useful or practicable to adopt the GLP in full, some of the principles do offer advantages for basic research. Institute management should consider and determine which of the GLP principles could be implemented at their Max Planck Institute on the basis of the prerequisites that are already in place there.

5. Data protection

Personal data should be sanitized as a matter of principle. In cases where personal data on test persons forms part of the actual research, the research-specific regulations of the Federal Data Protection Act (BDSG) must be observed. Personal data must be sanitized wherever this is possible in consideration of the purpose of the research. Up until such point, characteristics that can be used to assign personal or factual circumstances to an identified or identifiable person should be stored separately. To this end, the personal data in the research file is to be replaced with a case ID and stored with the case ID in a separate file. They may only be merged with the individual details if required to fulfill the purpose of the research.

The duty to separate such files is associated with a duty to block personal data. If a test person demands the deletion of his or her personal data, the data should merely be blocked. The blocked data may not be used for further research purposes. It may only be accessed if required in the course of action taken on suspicion of scientific misconduct.

6. Scientific publications

Publications are the most important medium for the dissemination of research results to the scientific community and to the general public. Through this medium authors publish results for the scientific reliability of which they accept responsibility. Publications which report on new scientific results, must therefore describe the results and the methods used fully and comprehensibly, and give full and correct credit for own and third-party preparatory work; results which have already been published beforehand should only be repeated to the extent that it is considered necessary for understanding the context. Any findings which support or call into question the results presented should equally be made known.

If several originators are involved in a research effort or in the publication arising out of that effort, the only persons who may be credited as co-authors are those who themselves made a considerable contribution to the design of the studies or experiments, to working out, analyzing or interpreting the data and to drawing up the manuscript, these persons also having agreed to its publication. Management of the organizational unit in which the publication arose is not, in itself, sufficient grounds to claim authorship. The authors always bear joint responsibility for the content; "honorary authorship" is not permitted. Support from third parties is to be recognized in an acknowledgment.

The practice in all disciplines must meet these standards, although specific arrangements in individual disciplines are permissible. For the publication of original work, a number of conventions have become established in recent years in the scientific community, and in many experimental disciplines in particular, which also enable outsiders to obtain a rough idea of the contribution of co-authors based on their position in the author line. The author line thus serves to facilitate correct external perception and not only the fair recognition of the demands of co-authors as a result of their cooperation.

The naming of authors is not merely a question of scientific ethics; it is also a copyright issue. The provisions of copyright law are generally binding. The author has the right to recognition of his or her authorship. Spuriously claiming authorship is illegal. Spuriously contesting authorship is unethical at the very least. In allocating authorship, scientific ethics and copyright law have the same point of origin, as a result of which the list of authors should permit an accurate imputation of the extent of each author's service as expressed in the text. Nevertheless, there are conflicting priorities between the two systems of standards because different aspects are being attributed in each case. Scientific ethics are concerned with attributing scientific accomplishments. However, when it comes to scientific publications in general, copyright law protects not the content per se, but merely the authorship. Thus, an author is any person who cooperated in the creation of a publication in the manner described above. While copyright law does to a certain extent permit agreements to be reached on the naming of authors, the right to attribution is in essence inalienable.

7. Conflicts of interest between science and industry

In the course of cooperative projects with commercial enterprises there are many areas of conflict, which can almost always be traced back to the collision of scientific interests and political, economic or financial interests. Conflicts may arise, for example, over the practice of patent registrations or the confidentiality of unpublished data. Secondary employment as a consultant or expert in the field can also lead to conflict; especially if the client wants to achieve a certain result that cannot be achieved on the basis of the objectively available data. Seats on Supervisory Boards or ownership of stocks in companies active in one's own research field can also lead to substantial conflicts of interest.

Links with industry must therefore be structured and practiced as equal partnerships. Economic aspects must not be allowed to take precedence over scientific freedom. If scientific priority finds itself in an irresolvable conflict with patent or economic priority, scientific priority must, in principle, be granted precedence even if economic advantages may be lost as a result. An institute should not enter into a relationship with industry solely on economic grounds and without the prospect of obtaining new findings.

In order to avoid conflicts of interest, all persons involved in a research project must disclose to their superiors or other responsible instances their financial and other interests and relationships where there is the possibility that these may conflict with their research activities. Moreover, care should be taken to ensure that no person holds both management responsibility in an institute and executive responsibilities in a company (including spinoffs).[1]

8. Appointing ombudspersons

An independent, appropriately qualified person of considerable personal integrity should be elected from among the scientific staff at each institute or research establishment of the Max Planck Society to act as an ombudsperson in cases of conflict on matters of good scientific practice. It is the job of the ombudsperson in particular to be available to all concerned as a confidential advisor in cases where there is suspicion of a violation of the principles of good scientific practice. In addition one person should be elected in each of the three sections, to perform the job of ombudsperson for the entire section. The names of the elected ombudspersons shall be made known in an appropriate manner.

The ombudsperson must treat in confidence any information brought to his or her attention concerning possible misconduct. The ombudsperson is not obligated to disclose such information to the institute management. In conflict situations the ombudsperson may choose to initiate a meeting with the person suspected of misconduct or with the institute management; however, in special cases the ombudsperson may confide in the ombudsperson at section level.

The job of the ombudspersons at section level is to act as a contact for the institute ombudspersons and for anyone who suspects scientific misconduct. Furthermore, they must keep an eye on general developments and identify any problem areas that may give rise to scientific misconduct.

All scientific and scientific-technical staff, including fellowship holders, should have active voting rights. Passive voting rights, on the other hand, should be granted only to those members of the scientific staff who have an employment contract with the Max Planck Society, since dealing with cases of conflict demands a certain level of experience. Scientific members should not be eligible for election because the purpose of the ombudsperson is to provide a point of contact that is independent of the institute management. Further details on the election and duties of ombudspersons are outlined separately in guidelines laid down by the Scientific Council.

The elected ombudspersons should not fulfill any other functions that may lead to a conflict of interests, such as membership of the works council.

---

[1] See the Max Planck Society's guidelines for spinoff managers.

The section ombudspersons should report on their work to the President once per year (in sanitized form). The regulations passed by the Senate on the introduction of an investigation procedure in cases of suspicion of scientific misconduct remain unaffected by this.

9. Whistleblower protection

One of the problems with scientific misconduct is that offenses are seldom made public, nor are they followed up by the scientific community. Scientists are often reluctant to make their suspicions of scientific misconduct known for fear of reprisals, bullying or exclusion and isolation. Younger scientists in particular are frequently not taken seriously by their superiors if they bring a suspected case of scientific misconduct to their attention. The Max Planck Society wishes to change that by enacting this regulation.

Institute staff shall be informed of the functions of the institute and section ombudspersons as a confidential point of contact for occasions when scientific misconduct is suspected. The name of the whistleblower shall not be made known during the ombudsperson's initial investigation. If the initial investigation leads to a formal investigation, the whistleblower's name shall only be made known if the person concerned would otherwise be unable to defend themselves properly or if the whistleblower's credibility or motives need to be examined. This is intended to ensure that whistleblowers can be heard without fear of repression.

Special attention should be paid to the protection of junior scientists. Past experience shows that particularly graduate students and doctoral students can see their future progress hindered if they point out a case of scientific misconduct or are themselves wrongly suspected of misconduct.

Ombudspersons should make it clear to staff that substantiated whistleblowing does not constitute denunciation or behavior that is detrimental to their group; rather, it is a necessary step in view of a suspected violation of scientific ethics. It is not the whistleblower voicing a justified suspicion who damages colleagues or the institute concerned, it is the scientist carrying out the misconduct. Institute management should support the ombudspersons in their work with clear stipulations confirming that scientific misconduct will not be tolerated.

Acknowledgment of Receipt

The Rules of Good Scientific Practice consist of 8 Pages. I hereby declare that I have received all pages, that I have read them, and that I agree to them.

_____	_____
(Date)	(Signature)