eLabFTW – digitalize your lab work

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https://fdm.hhu.de

in cooperation with the

Institute of Neurobiology

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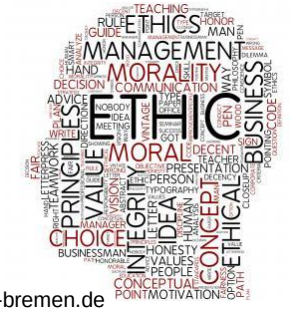
The excerpts are taken from “Guidelines for Safeguarding Good Research Practice – Code of Conduct “ (DFG; German Research Foundation, 2019)

„Scientific integrity forms the basis for trustworthy research. It is an example of academic voluntary commitment that encompasses a respectful attitude towards peers, research participants, animals, cultural assets, and the environment, and strengthens and promotes vital public trust in research. The constitutionally guaranteed freedom of research is inseparably linked to a corresponding responsibility. Taking this responsibility into full account and embedding it in individual conduct is an essential duty for every researcher and for the institutions where research is carried out.“



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Excerpt from Guideline 1 “Commitment to the general principles” and Explanations:

“Individual researchers are responsible for ensuring that their own conduct complies with the standards of good research practice..” […] “In particular, the principles include working *lege artis*, maintaining strict honesty in attributing one’s own contributions and those of others, rigorously questioning all findings, and permitting and promoting critical discourse within the research community.“

Excerpt from Guideline 2 “Professional ethics”:

“Researchers are responsible for putting the fundamental values and norms of research into practice and advocating for them.” […] “Researchers at all career levels regularly update their knowledge about the standards of good research practice and the current state of the art.“

Guideline 7 “Cross-phase quality assurance” and Excerpt from Explanations:

“Researchers carry out each step of the research process *lege artis*. When research findings are made publicly available (in the narrower sense of publication, but also in a broader sense through other communication channels), the quality assurance mechanisms used are always explained. This applies especially when new methods are developed.“

“Continuous quality assurance during the research process includes, in particular, compliance with subject-specific standards and established methods, processes such as equipment calibration, the collection, processing and analysis of research data, the selection and use of research software, software development and programming, and the keeping of laboratory notebooks.“

“If researchers have made their findings publicly available and subsequently become aware of inconsistencies or errors in them, they make the necessary corrections.“

Continued…

Guideline 7 “Cross-phase quality assurance” and Excerpt from Explanations:

“The origin of the data, organisms, materials and software used in the research process is disclosed and the reuse of data is clearly indicated; original sources are cited. The nature and the scope of research data generated during the research process are described. Research data are handled in accordance with the requirements of the relevant subject area. The source code of publicly available software must be persistent, citable and documented. Depending on the particular subject area, it is an essential part of quality assurance that results or findings can be replicated or confirmed by other researchers (for example with the aid of a detailed description of materials and methods).“

Guideline 8 “Stakeholder, responsibilities and roles” and Excerpt from Explanations:

“The roles and responsibilities of the researchers and research support staff participating in a research project must be clear at each stage of the project.“

“The participants in a research project engage in regular dialogue. They define their roles and responsibilities in a suitable way and adapt them where necessary.“

Guideline 9 “Research Design” and Excerpt from Explanations:

“Researchers take into account and acknowledge the current state of research when planning a project. To identify relevant and suitable research questions, they familiarise themselves with existing research in the public domain.“

“Methods to avoid (unconscious) distortions in the interpretation of findings, e.g. the use of blinding in experiments, are used where possible.“ […] “The context in which the research was conducted is taken into consideration when interpreting findings.“

Guideline 11 “Methods and standards” and Excerpt from Explanations:

“To answer research questions, researchers use scientifically sound and appropriate methods. When developing and applying new methods, they attach particular importance to quality assurance and the establishment of standards.“ […] “The establishment of standards for methods, the use of software, the collection of research data and
the description of research results is essential for the comparability and transferability of research outcomes.“

Guideline 11 “Documentation” and Explanations:

“Researchers document all information relevant to the production of a research result as clearly as is required by and is appropriate for the relevant subject area to allow the result to be reviewed and assessed. In general, this also includes documenting individual results that do not support the research hypothesis. The selection of results must be avoided. Where subject-specific recommendations exist for review and assessment, researchers

create documentation in accordance with these guidelines. If the documentation does not satisfy these requirements, the constraints and the reasons for them are clearly explained. Documentation and research results must not be manipulated; they are protected as effectively as possible against manipulation.“

“An important basis for enabling replication is to make available the information necessary to understand the research (including the research data used or generated, the methodological, evaluation and analytical steps taken, and, if relevant, the development of the hypothesis), to ensure that citations are clear, and, as far as possible, to enable third parties to access this information. Where research software is being developed, the source code is documented.“

Excerpt from Guideline 13 “Providing public access to research results” and Explanations:

“As a rule, researchers make all results available as part of scientific/academic discourse.“ […] “Where possible and reasonable, this includes making the research data, materials and information on which the results are based, as well as the methods and software used, available and fully explaining the work processes. Software programmed by researchers themselves is made publicly available along with the source code. Researchersprovide full and correct information about their own preliminary work and that of others.“

“In the interest of transparency and to enable research to be referred to and reused by others, whenever possible researchers make the research data and principal materials on which a publication is based available in recognised archives and repositories in accordance with the FAIR principles (**F**indable, **A**ccessible, **I**nteroperable, **R**eusable). Restrictions may apply to public availability in the case of patent applications. If self-developed research software is to be made available to third parties, an appropriate licence is provided.“

Excerpt from Guideline 17 “Archiving” and Explanations:

“Researchers back up research data and results made publicly available, as well as the central materials on which they are based and the research software used, by adequate means according to the standards of the relevant subject area, and retain them for an appropriate period of time. Where justifiable reasons exist for not archiving particular data, researchers explain these reasons.“ […]

“When scientific and academic findings are made publicly available, the research data (generally raw data) on which they are based are generally archived in an accessible and identifiable manner for a period of ten years at the institution where the data were produced or in cross-location repositories. This practice may differ depending on the subject area. In justified cases, shorter archiving periods may be appropriate; the reasons for this are described clearly and comprehensibly. The archiving period begins on the date when the results are made publicly available.”

Following principles are taken from “Rules on the Principles of Safeguarding Good Scientific Practice“ (HHU)

- 1. Researchers must endeavor to carry out their studies lege artis, **to the best of their knowledge** and belief and in accordance with the current state of scientific knowledge and to question all results with regard to their plausibility. Strict honesty must be preserved with regard to contributions made by partners, superiors, co-workers, colleagues, competitors and predecessors.

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Following principles are taken from “Rules on the Principles of Safeguarding Good Scientific Practice“ (HHU)

- 2. All studies and research work must be carried out lege artis and in accordance with the current state of scientific knowledge and take into consideration current literature as well as methods appropriate and specific of the discipline. All sources consulted must be mentioned.

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Following principles are taken from “Rules on the Principles of Safeguarding Good Scientific Practice“ (HHU)

- 3. The methods applied, findings and results as well as other primary data must always be appropriately **documented and archived** for the duration of at least ten years. Accurate and traceable recording and documentation of the scientific approach and results applies particularly for experimental work where the repeatability of trials and experiments is a core feature.

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Following principles are taken from “Rules on the Principles of Safeguarding Good Scientific Practice“ (HHU)

- 4. Scientific results are commonly announced to the scientific community in the form of publications. Scientific publications, just as scientific observations or the actual scientific experiment itself, are this also the product of researchers’ wok.

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Following principles are taken from “Rules on the Principles of Safeguarding Good Scientific Practice“ (HHU)

- 5. Researchers must comply with those principles of scientific work which are discipline-related and specific to a particular field.

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Following principles are taken from “Rules on the Principles of Safeguarding Good Scientific Practice“ (HHU)

§9 Storage of primary data and documentation obligations

- 1. Primary data (e.g. measurements, collections, studies, survesy, cell cultures, specimens of material, etc.) as the basis for publications must remain accessible on stable and secured media in the working group where they were produced for a minimum period of ten years.

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Following principles are taken from “Rules on the Principles of Safeguarding Good Scientific Practice“ (HHU)

§9 Storage of primary data and documentation obligations

- 2. Documentation can take place in the form of laboratory journals, logbooks and work books or **in suitable digital form.** They must be protected and kept safe from unauthorized access and secured and kept in such a way that fabrication or falsification is prevented as far as possible. Should a researcher move to another institution, the original data and records categorically remain at the institution where they were produced.

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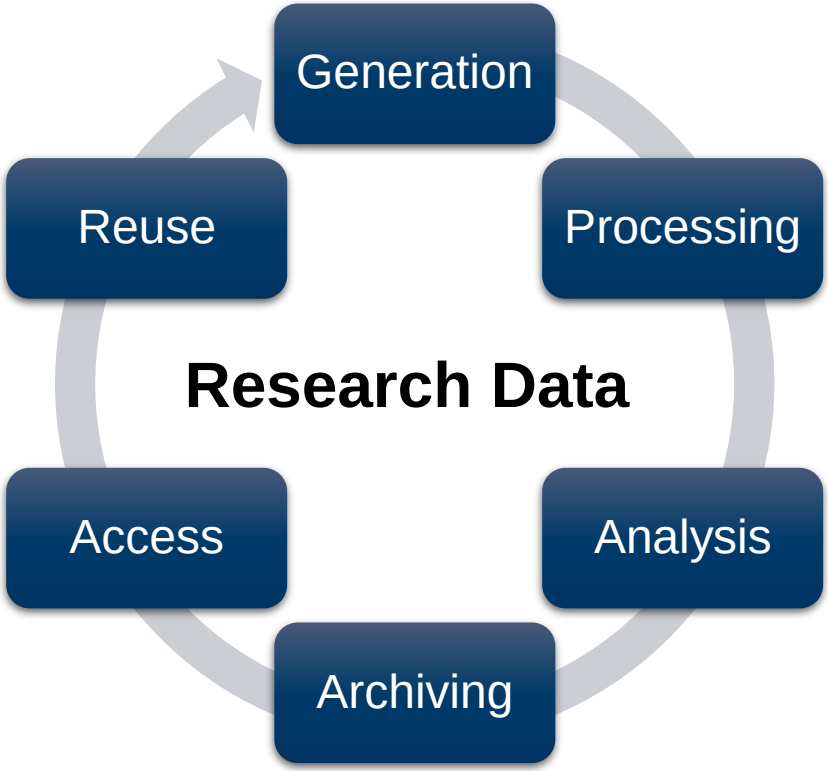
Research Data Management



Electronic lab Notebooks

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In its most basic form electronic lab notebooks might simply provide a word-processor-like interface to replicate the way you currently use a paper notebook, but with additional benefits such as shareability, searchability, password protection and backup.

Integrate all your data

Customize your entries

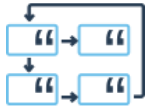
Open documents

Access your data everywhere

Visualize and annotate images

Export your data

Electronic lab Notebooks



Create an experimental workflow

Data Elements

Create shared projects

Store and share protocols/templates

Discuss your data

Databases and Items

Full Audit Trail

Filters & Tags

Time Stamps

Universal and Advanced Search

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With participation of Dr. C. Dumpitak, iGRAD, GSP