Good Scientific Practice

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Basel University, like most other modern teaching- and research Institutions have regulations to demonstrate, advance and if necessary enforce good practice in the conduct of research. The rules procedure of Basel University:

Code of Academic Integrity and Good Practice in the Conduct of Research (18 October 2011)

called „Code of Conduct“ below) is the basis of this introduction in good scientific practice. The Code of conduct is enclosed and can be downloaded from the server of the University of Basel in German and English. In addition there is enclosed a press release from the Swiss National Fund on the same subject.

The basic principle of the Code of Conduct (§ 1.2) says:

„Honesty and integrity stand at the heart of all research and academic endeavour, and are hereby deemed absolutely necessary. This fundamental principle is an essential prerequisite for the credibility of research and science, and it substantiates any claim laid to academic freedom.“

All researchers must at all times observe the principle of authorship as an indispensable part of responsible research conduct.

Honesty: to fully believe in the truth of one’s conclusion / declaration
(Note: Honesty is used here for the German "Wahrhaftigkeit". Truthfulness might be a better translation).

Integrity: To be in Accordance with idealistic values in your life and work (at least on the whole, not in every detail). (This is about the credibility of the scientist)

Scientific research: activities that are understood as methodical in efforts to establish the truth.

Therefore the claim arises that everybody that conducts scientific research has to present the results of their work truthfully. This includes mainly (but not only) the following points:

1. Any person that participated has to be mentioned

Most scientific studies are conducted with the aim to publish the results. The code of conduct concerns the authorship in scientific publications. It says:

• Any person who has made an essential contribution to the work presented in a publication has the right to be identified as an author.

• Essential contributions are identified by contribution in planning, execution, evaluation and checking of the study.

• Anyone identified as an author of a publication shall accept responsibility for the contents of that publication (at least to the extend that he has the possibilities to do so).

In practice this is not always easy. The main issue is: What does „substantial“ mean? In many cases it depends on the historic and socio-cultural customs in a workgroup. Therefore in practice the following approach is recommended, especially (but not only) if conflicts may arise: In the early stages of a
project it should be clarified who does what and who has which role in the author’s list. Once that is clear, everyone knows his tasks and what to expect. In case there are major changes in the project or the team (e.g. one team member can contribute less than planned) it makes sense to revise and adjust the original plan. The author’s list often plays a central role in this process, since the place on the list of authors often reflects the role of the author in the project. The following roles are distinguished:

**Junior author (= First author)**
The person that contributed the greater percent, intellectually or conceptually, is entitled to this role. Usually it is the person that did the most of the work for a project. Normally it is the task of the Junior author to write at least a first draft of the report, including the preparation of pictures and tables. Junior authorship is especially important for young scientists. In practice junior authors are often master students, PhD students or Post Docs.

**Senior author (= Last author)**
The project Manager is often considered the senior author. This position shows that the person supports or makes the project possible intellectually, conceptually, but also through infrastructure (through education, laboratories, funding). In many cases the senior author is the driving force behind the project and writes the final version of the script. Often senior authorship indicates that this person leads an independent working group and is therefore important for the career of the senior author. Senior authorship is important for established scientists. The code of conduct of the University of Basel says on this matter: “Neither an executive position held in a research institution nor the provision of financial or organisation resources or support for a project shall entitle any person to be identified as an author.” (§3.3).

**Corresponding author**
The corresponding author conducts the correspondence with the publisher (book or journal publisher). He has a great responsibility since he has to make sure that there are no mistakes made in the printing process. He is also responsible for the correspondence with the readers that may have questions to the publication. The corresponding author is usually the junior or the senior author.

**Further authors**
Most studies these days are carried out by groups of scientists. This is the reason for long author lists. As a general rule one can read such a list from top to bottom as downwards contribution by the authors (apart from the senior author). Since this isn’t always easy, it is advisable to fix the author sequence as early as possible.

**Shared first or last authors**
If two collaborators contributed both considerably (and about equally) there is the possibility of listing them as „shared first authors“ or „shared last authors“. However this has little influence in practice.

**Acknowledgements**
Not everybody that contributed a little bit to a project should be named as co-author. However, the contribution should be acknowledged and appreciated. The contribution of a co-author has to be clearly more than just a bit of help. It is always difficult to decide, who is just acknowledged and who is a co-author. Here as well it is highly recommended to define this early on. In the acknowledgment it should be said for what you thank a person. E.g. „We thank Klaus Nerd for critical comments on an earlier version of this manuscript, John Normal for statistical advice and Werner Erlenmeyer for assistance with chemical analysis.“
2. Truthfulness / veracity of the data

Scientific work has the aim to find truths. Therefore it is important, that all data are presented (at least in principle, through the use of appropriate statistics) and described truthfully. The invention, manipulation, stealing and omitting of data is a scientific malpractice and is considered a capital crime among scientists. It is not a trivial offence, but deceit (arglistige Täuschung). This is valid for research as well as for teaching.

Scientific (miss-)conduct

Every scientist is morally bound (and usually also legally bound through his work contract) to avoid scientific fraud. The code of conduct of the University of Basel lists the following offences as scientific fraud:

- The fabrication of research data
- Plagiarism: the unlawful use of another persons intellectual property (theft and exploitation of research material (=copying) of ideas
- The unlawful assumption or omission of authorship
- Obstruction / sabotage of research work
- Acts of revenge against persons that disclose scientific fraud

Furthermore one can mention

- Multiple publishing of the same materials as an original work
- The deliberate misapplication of statistics
- The unjustified retaining of material, information and or data to third parties

Plagiarism

It should be clear that scientific texts (but also other texts) should not be cited without the acquiescence of the original author or without an appropriate quotation. This sounds easy, but is often difficult. Especially in the introduction to a subject about which many others have written already, it can easily happen that you would wish to use an elegant phrase (or whole paragraphs) from a publication. It takes some experience to express such material in your own words. One can lean on someone’s logic or syntax but to use whole sentences or text passages is not allowed, unless you cite it as a quote (rarely done in scientific texts). One should always refer to the author in such a case. (Just imagine that you read a paper and you find your text and thoughts under a strange name!)

When does one have to cite / quote? In the following cases one should name the original author and name the source:

- Quote facts and evidence that appear in your own argument / reasoning
  - E.g. It is known that A follows from B (Ebert 1897).
- Ideas, hypothesis and thoughts you use (even if you are not of the same opinion)
- Literal repetition of sentences or text passages have to be shown as citation.
  - ”A follows from B” (Ebert 1897, page 13).

3. Non-compliance / Contravention

The demonstrable conscious contravention against the common rules in science (research and teaching) are severely punished these days. The accused will be charged with a penalty.

- Employed scientist often loose their appointment and their academic title (Doctor, Privatdozent, Professor). Usually they loose any scientific recognition.
- Persons in a scientific training (students, doctoral students) often loose the right to finish their degree.

Often, the only possibility left is to change profession.