

RIKEN's Regulations on the Prevention of Research Misconduct stipulates the responsibility of those in the following positions: center director, laboratory head and personnel as shown below.

Personnel duties

1. In scientific research, it is the individual researcher who proposes and carries out research, analyzes and evaluates data, and publishes the results. Therefore, it is the individual researcher who must be held accountable for any misconduct that goes against research ethics. Given this, all personnel are expected to maintain the highest standards of ethical conduct and abide by the following precepts:
 - (1) Do not engage in research misconduct.
 - (2) Do not contribute to research misconduct.
 - (3) Do not solicit others to engage in research misconduct.
2. Personnel must take all research ethics courses required by RIKEN within the time limit set by RIKEN.
3. Personnel must appropriately implement RIKEN's requirements for maintaining research records and follow required procedures for publicizing research results.
4. Personnel must faithfully comply with the Research Ethics Education Officer's directives or requests for improvements in measures to prevent research misconduct.

1. Prevention of research misconduct

Case 1 Fabrication

An image of a sample unrelated to the research paper, and obtained in experimental conditions differing from those described in the text of a study, was submitted as a figure obtained under the experimental conditions described in the study.

Case 2 Falsification

An electrophoretic image obtained in an experiment contained a band that could not be explained. The band was intentionally erased using image-altering software.

Case 3 Plagiarism

Without obtaining the author's permission, a researcher translated into his own language the results of another group of researchers and used the material as his own results in a lecture he gave at an academic conference in his country. The presentation material did not indicate the original source, and citation was not made in an appropriate manner².

■ Explanation

RIKEN's Regulations on the Prevention of Research Misconduct defines "research misconduct," "fabrication," "falsification" and "plagiarism" as follows³.

In these regulations, the term "research misconduct" refers to deliberately, or through gross negligence, fabricating, falsifying or plagiarizing data or investigation results in a published paper or presentation of research results.

- (1) Fabrication: Making up data or research findings that do not exist.
- (2) Falsification: Manipulating research documents, specimens, equipment, or processes so that data and research results are no longer authentic.
- (3) Plagiarism: Appropriating another person's ideas, analyses, data, research results, papers or terminology without the other person's consent or without giving appropriate credit.

Incidents of research misconduct result in the loss of credibility and public trust in science and technology. Such activity may also damage the reputation of the institution. Also, when a committee is convened to investigate the incident, a large amount of time, energy and public funds are expended.

² (Case confirmed by MEXT as an example of research misconduct)

A confirmed case of plagiarism by teaching staff affiliated with Center for Environment, Health and Field Sciences, Chiba University

http://www.mext.go.jp/a_menu/jinzai/fusei/1360843.htm (J) (February 20, 2016)

³ Article 2, paragraph 2 of the Regulations on the Prevention of Research Misconduct

New image-processing software makes it easier to alter images on computer screens in order to make images clearer for presentations and publications. However, overuse of such techniques may result in fabrication of data. Many academic journals post warnings on the publication of images in their rules for manuscript submission. For instance, the *Journal of Cell Biology* gives the following instructions⁴.

Image Presentation:

As noted above in our “Editorial Policies” section, all figures from manuscripts that have received an editorial acceptance will be screened for any evidence of manipulation. As you prepare your figures, please adhere to the following guidelines to ensure accurate presentation of your data and to minimize delays during production:

- No specific feature within an image may be enhanced, obscured, moved, removed, or introduced.
- The grouping of images from different parts of the same gel, or from different gels, fields, or exposures, must be made explicit by the arrangement of the figure (i.e., using dividing lines) and in the text of the figure legend. If dividing lines are not included, they may be added by our production department, and this may result in production delays.
- Adjustments of brightness, contrast, or color balance are acceptable if they are applied to every pixel in the image and as long as they do not obscure, eliminate, or misrepresent any information present in the original, including the background. Non-linear adjustments (e.g., changes to gamma settings) must be disclosed in the figure legend.

A more detailed discussion of image presentation can be found here (Rossner and Yamada, *J.Cell Biol.* 166: 11-15)

Plagiarism, an instance of misrepresenting the authorship of a document, is an act of serious professional negligence, which displays a lack of honesty and ethical judgement⁵. It is also a violation of copyright laws⁶.

Even if you have no intention to profit through such acts, you may be suspected of plagiarism if you have not properly cited prior research. Before submitting a manuscript for publication, always confirm whether you have neglected any attributions, or made any mistakes in your citations, by using iThenticate, the text similarity tool subscribed to by RIKEN.

When suspicions of research misconduct are raised, all coauthors of the study—not just the person accused of the misconduct—are held responsible and are asked to produce material to explain the extent of their contribution to the study. They must also explain their involvement in the study and the role they played in collecting and processing experimental data and images. Furthermore, even if they themselves are not authors or coauthors, supervisors of those involved will be asked whether they exercised sufficient managerial guidance. If it is found that such guidance was insufficient, their managerial responsibility will be called into question.

⁴ Instructions for Authors, The Journal of Cell Biology
<http://jcb.rupress.org/site/misc/print.xhtml#digim> (February20,2016)

⁵ For the Sound Development of Science—The Attitude of a Conscientious Scientist

⁶ Japan Society for the Promotion of Science
https://www.jsps.go.jp/j-kousei/data/rinri_e.pdf (February20,2016)
Article 119, paragraph 2 of the Copyright Act