

Measures to Prevent Research Misconduct at Nagoya University

Approved by Education and Research Council on September 6, 2022

In 2008, Nagoya University established the “Nagoya University Rules on Handling Misconduct in Research,” which have been repeatedly revised in accordance with guidelines published by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). Although these rules were thought to be adequate, in reality, the lack of concrete measures made them insufficient to eradicate research misconduct. A common factor in many cases of research misconduct, both in Japan and overseas, is the retention of source data. To protect our researchers and students from research misconduct, NU has established the following measures to prevent research misconduct.

1. Comprehensive research ethics education for all members of Nagoya University

- At the beginning of each academic year, the Research Ethics Education Officer at each department (the head of the department) will complete the Faculty Development (FD) program, which includes research ethics education, that is offered by NU's Chief Research Ethics Promotion Officer (Vice President).
- Every year, NU will offer an e-learning course to educate researchers in research ethics. Those who do not complete the e-learning course will be suspended from applying for competitive grants for that academic year. Research ethics education will also be made a compulsory subject for undergraduate students (class year to be determined by each department) and graduate students in the form of either an e-learning course or a lecture-based class, with each department setting its own requirements.
- Furthermore, the Research Ethics Education Officer will take advantage of opportunities such as faculty meetings to instruct faculty members in research ethics education, during which they will provide specific examples that are relevant to the unique characteristics of their department.
- For research conducted within University facilities such as research centers by students whom such facilities accept from the graduate schools, the directors of each facility will serve as Research Ethics Education Officers

2. Corresponding authors and their responsibilities

- For peer-reviewed papers for which NU is credited, the corresponding author(s) should be designated by the time the paper is submitted. Even if the corresponding author is not specified in the paper itself depending on the characteristics of each field, at least one corresponding author should be designated, who may be the first author or the leader of the research group (such as PI) of the published paper. The responsibilities of corresponding authors who are members of NU are described in items 3 and 4 below.
- The corresponding author is responsible for the appropriate preservation and storage of research materials. See item 3 for specific methods. If research materials are owned by another institution (e.g., a university or company), such as in the case of joint research, the corresponding author is responsible

for confirming that the materials are properly stored.

- The corresponding author is responsible for the validity of the peer-reviewed paper. See item 4 for details.
- If a student is designated as the corresponding author, the student's academic advisor should supervise the student in fulfilling his/her responsibilities as the corresponding author.

3. Achieving appropriate storage and management of research materials as mandated by the "Nagoya University Rules on Handling Misconduct in Research"

• In order to ensure that the research activities can be proved valid and to guarantee that they can be verified by third parties, experiment and observation records, experimental data, and other research materials (hereinafter referred to as "research materials") must be properly stored and managed, and they must be disclosed when deemed necessary and appropriate. To ensure that this is done effectively, it is important to comply with the following points:

(1) The corresponding author must store the research materials on a server provided by NU immediately after the paper is accepted.

(2) The research materials that should be stored are the experimental notes, experiment data, data related to numerical analysis, etc. that are used in the paper. If the raw data(*) is extremely large in size, it may be replaced by the processed data used in the paper; in this case, however, the corresponding author should store the raw data elsewhere, as well as store the data processing procedure (e.g., by self-made software) on the server together with the other research materials.

(*) Raw data means original data sufficient to confirm the reproducibility of the research results. It does not include books and published materials.

(3) The research materials that should be stored are not to be decided by a one-size-fits-all-rule, but rather may differ between fields. Therefore, the corresponding author must decide the research materials that should be stored. The corresponding author should store the research materials that they judge to provide sufficient evidence of the paper's validity. Clinical data containing personal information should be stored according to national regulations. If, in the academic field, it is deemed appropriate to store data in a manner not in accordance with these rules, such as for large-scale collaborative research or numerical simulations utilizing big data that are required to store data in an internationally recognized database, alternative methods of storing data may be approved upon consultation with the Research Ethics Education Officer.

(4) If there are collaborating researchers at other institutions, the corresponding author should ask the collaborating researchers to store their research materials at their own institutions. If the corresponding author of the paper is affiliated with another institution, the collaborating researchers affiliated with NU must, in the same manner as corresponding authors, store his or her research materials on a server provided by NU.

(5) It is the Research Ethics Education Officer's responsibility to have the corresponding author submit with each paper a declaration that he or she is in compliance with all research material storage obligations, to compile a list of files in the research paper directory each academic year, and, having done these, to report to the Chief Research Ethics Promotion Officer. The Research Ethics Education Officer has the authority to access data stored on the server by department members.

(6) All research materials related to published papers should be stored on the server for 10 years, even if the author of the paper is no longer affiliated with NU, such as due to graduation, resignation or retirement.

(7) Any research materials not directly used in the paper should be stored for 10 years, and this is the responsibility of the Principal Investigator (PI). If a PI ceases to be affiliated with NU, such as due to resignation or retirement, the PI should consult with Research Ethics Education Officer and preserve the research materials appropriately. In principle, samples and specimens related to published papers are to be stored for five years.

(8) NU provides electronic experiment notebooks (if they are practical and realistically useable) and software that can be used to check for research misconduct when submitting papers (e.g., iThenticate, which checks for plagiarism). The corresponding author may not submit a paper until he or she has confirmed using those software programs that there is no research misconduct. Specifically, the verification results from the fraud assessment software must also be stored on the server.

4. Ensuring the reproducibility of research results

- Research results that are obtained by a specific individual from among the authors of a paper must be checked for validity by the corresponding author before the paper is submitted. In particular, when an experiment is rerun in order to confirm the results, the experimental notebooks, experimental data, and other research materials related to the repeated experiment should also be stored on the server together with the research materials used in the paper. If, after the paper is published, the research results cannot be reproduced, it should be assumed that the suspicion of research misconduct cannot be ruled out. The issue should immediately reported to the Research Ethics Education Officer and the Chief Research Ethics Promotion Officer, and the corresponding author is responsible for taking necessary measures such as retracting the paper.

Note

- Ethics education

For the purpose of ethics education, NU Research Ethics Education Officers (heads of departments) will take up specific cases of research misconduct, prepare educational materials using data, figures, graphs, etc. to show what acts constitute research misconduct and how damaging research misconduct

can be, and make use of them in the department's research ethics education. Furthermore, each department's Research Ethics Education Officer is responsible for adding issues specific to his or her department to the abovementioned educational materials and using those materials to educate students and new faculty members. We recommend making use of online teaching materials, etc. in order to keep students engaged and interested.

- If research misconduct is suspected, do not attempt to cover it up. Contact the Chief Research Ethics Promotion Officer as soon as possible.

Reminders to students

Written Pledge: NU currently requires degree applicants to submit a written pledge that they have not plagiarized, but we will also require written pledges that they have not fabricated, tampered with, or plagiarized data.

Revocation of degree: In principle, an individual who earns a degree by fraudulent means will have the degree revoked.

Improving Our Research Capabilities

Fostering a culture of openness at laboratories and research groups is important to prevent research misconduct and further promote research activities. All NU departments will implement the following measures in ways that accommodate the needs of each department.

- **Laboratory visit counseling**

As Student Support's Student Counseling Center has done in the past, counselors will visit individual laboratories to interview students and researchers and provide counseling as necessary.

- **Double mentoring system**

Each student will be assigned a secondary faculty advisor, not as a formal sub-advisor but as a mentor outside the student's laboratory. Mentors will have regular meetings with their mentees to discuss topics such as research progress and any current concerns.

- **Suggestion box ("Meyasu-bako")**

Each department will set up an online "Suggestion Box" that will be personally read by the Dean of the graduate school. Anonymous submissions will also be accepted.

- **Laboratory rotation system**

Departments/programs will establish a system that allows undergraduate and master's students to experience several laboratories (or, if researchers in the department usually conduct research independently rather than conduct research at a laboratory or research group, to have opportunities to experience research with several researchers) during their first few months after enrollment. Ideally, this should occur before the student is assigned to a laboratory, but even for master's students who have already been assigned to a laboratory, temporarily engaging with another laboratory promises to inspire and motivate both the student and the host laboratory.

- **Support system for students/young researchers to experience research abroad**

NU will provide support for PhD students to temporarily join overseas laboratories and engage in research activities. Doing so will allow them to experience the diversity of research cultures and share good practices after their return.