



The National DNA and Tissue Repository Policy

This policy applies to all NHMD employees, contractors, associates, students, and volunteers. Sections of this policy also apply to formal visitors and users of the collections.

This policy was approved by the Board of Directors on 18 April 2023 and shall remain in place until a revision is issued by the Deputy Director for Collections.

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The National DNA and Tissue Repository (NDTR) Policy

1. Introduction

The Natural History Museum of Denmark (NHMD) is the national repository for DNA and tissue samples. DNA and tissue samples from Denmark, Greenland, and the Faeroe Islands are deposited here alongside samples collected in other countries by Danish or other researchers associated with NHMD.

Through the repository, Denmark is part of an international network of DNA and tissue repositories, which delegates the work of collecting and preserving samples from the millions of species on our planet.

This policy deals with the materials that are archived for the very purpose of enabling the study of biological diversity at the genome, cell, or tissue level: tissue samples, DNA extractions of animal, fungal or plant specimens, and animal tissue samples stored deep-frozen in the repository. The policy defines the purpose of the collections, the objectives and content of the procedures and activities related to them, the distribution of responsibilities for collection management and maintenance, and the principles of collection accumulation, preservation, and accessibility.

2. Purpose

The overall objective of the National DNA and Tissue Repository (NDTR) of the Natural History Museum of Denmark is to store DNA-grade tissue samples and DNA extracts to maintain the full potential of specimen-based research for the benefit of present and future generations. NHMD has a national obligation to store material from Denmark, including Greenland and the Faroe Islands. Furthermore, the NDTR also keeps samples of global biodiversity, preferentially, but not exclusively, collected by the staff of NHMD, national partners and institutions (incl. e.g., zoos and aquaria), either stand-alone or as part of international collaborations.

In accordance herewith the NDTR:

1. Acts as the central storage facility of the NHMD for frozen tissue and DNA samples.
2. Acts as the repository for material collected by Danish, Greenlandic, Faroese or other nations' researchers/research institutions, to the extent that the material is collected in accordance with NHMD's collections policies.
3. Engages in collecting, storing, and exchanging of tissue samples of global biodiversity.
4. Accumulates nationally or internationally significant collections within the taxonomic groups and geographical areas relevant to the research of NHMD.
5. Makes material available for use by the global scientific community, in accordance with this policy.

3. Description, Standards, Conditions and Ownership

The National DNA and Tissue Repository consists of both *The Cryobank* and *The Frozen Tissue Repositories* (Collections Freezers).

To be ideal for genomic research, samples are stored at NDTR under conditions of ultra-deep freezing (-150° C or colder) in the cryobank, which is most suitable for the preservation of both DNA and other cellular components. NDTR is optimized for this purpose. Samples are also stored in, e.g., ethyl alcohol or other preservation media under higher temperatures, e.g., in -20° C or -80° C collections freezers. Samples are stored at NDTR for as long as their integrity is preserved.

Samples stored in NDTR must meet the following conditions:

- They must be relevant to, and consistent with, the objectives and activities of the NHMD and its role as a national facility of international value.
- They should be of a quality, which makes it possible for NHMD to curate them in line with all other collections.
- They must come with relevant metadata and, ideally, a voucher stored and recorded at the NHMD or at a similarly accessible natural history collection.
- They must include the necessary documentation (e.g., collection permits, export and import permits and after October 2014 any documents pertaining to the Nagoya Protocol on Access and Benefit-sharing and EU regulation 511/2014) to assure that they were collected or acquired in accordance with national and international legislation and regulations. This condition is in force regardless of how the samples were acquired (e.g., directly collected in the field, acquired as a gift, received as loans or as part of an exchange), and whether or not they are associated with a physical voucher.

The following samples will not be considered for storage at NDTR:

- Genetic material that has been fixed in formalin
- Whole organisms that do not fit into a standard 2 ml cryovial
- Material that is not supported legally and/or not in compliance with Regulation (EU) No. 511/2014
- PCR or sequencing products
- Human tissue samples of any kind
- Cell lines or tissue cultures
- Samples containing or likely to contain disease-causing organisms hazardous to humans
- Any material that is being retained as evidence for legal proceedings

Expected larger accession of samples to NDTR (e.g., in connection with fieldwork) should be brought to the attention of the curator of the NDTR well in advance, to ensure that the NDTR is ready to receive the samples immediately after their arrival to the NHMD.

Any legal restrictions on the use of material must be reported at the submission of samples for storage in NDTR. Such reports must make clear reference to the duration, nature, and extent of these legal restrictions. The Deputy Director for Collections is the final arbiter in the case of conflicting opinions on whether the material should be stored in NDTR, or whether or not it legally can later be handed over to relevant persons or institutions for research.

Material collected and stored by the staff of NHMD is the property of the Danish State. Ownership of all other samples must be permanently transferred to NHMD, in writing, and accompanied by all relevant documentation.

The NHMD does not generally purchase DNA and tissue samples.

4. Curation Strategy and Responsibilities

As with all other NHMD collections, the well-being and growth of the NDTR is the responsibility of all NHMD curators whose research, taxonomic expertise, sampling, and collaborations are crucial for proper curation of the respective taxonomic groups. However, unlike other NHMD taxonomic collections stored in diverse ways, the NDTR must meet certain overall standards and procedures that are overseen by the curator in charge, as well as the designated collections managers.

The curator in charge of NDTR has the responsibility to apply this policy and to ensure that applicable and relevant national and international policies and the conventions on exchange of genetic resources are

respected. These include, but are not limited to, the Convention on Biological Diversity (CBD) and the Nagoya Protocol on Access and Benefit-Sharing (ABS), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and operations in compliance with the CETAF (Consortium of European Taxonomic Facilities) and GGBN (Global Genome Biodiversity Network) codes of conduct.

5. Documentation

Documentation that the samples have been collected legally and in agreement with national and international conventions must be filed by the NHMD.

Non-documented samples are not accepted. Additional documentation may be required depending on the general collections policies of NHMD.

6. Access to the National DNA and Tissue Repository

6.1 Physical access for NHMD staff

All NHMD curators must oversee their respective taxonomic groups at NDTR via contributing samples to NHMD, maintaining loan traffic or recording deaccessions (e.g., tissues or DNA extracts that expire). They are responsible for the proper labelling and curation of the traditionally preserved voucher specimens (e.g., pinned insects, bird skins, specimens in other liquid preservatives) whose tissues or DNA are kept at NDTR. However, such curators have only virtual access to their respective NDTR sections in the cryobank via the collections database. They are responsible for proper maintenance and updates of their respective digital records.

There is NO open physical access to the cryobank at the NDTR. For safety reasons and for the security of the collections, only specially trained designated collections managers associated with NDTR have the access to physically add or remove material from the cryobank. Other staff members of NHMD (except for the curator of NDTR) are only allowed access in the company of at least one of these designated persons.

The designated staff will follow the University of Copenhagen's "Safety Manual for Staff Working in Laboratories."

Samples stored in collections freezers are only to be handled by designated curators or other collections staff, individually appointed for each collection.

6.2. External access

Individuals, who are not employed at the NHMD, do not have access to NDTR.

6.3. Scientific Access

The material is usually only distributed to institutions engaged in research and teaching and may not be transferred from the receiving institution to any other institution without prior written permission. Material is only distributed to institutions, not to individuals. Distribution of material to third parties (e.g., for commercial use), may only take place in accordance with the restrictions originally attached to the material. Third parties are responsible for ensuring compliance for utilisation under the terms of the Convention on Biological Diversity, the Nagoya Protocol and if relevant Regulation (EU) No. 511/2014.

7. External Destructive Sampling

NDTR receives and distributes research material in accordance with its overall scientific goals and is committed to maintaining an appropriate balance between short-term use of the collection and the obligation to secure the material for future use. NDTR must respect all restrictions attached to the material.

7.1 Requests for Destructive Sampling

Requests for destructive sampling of material from NDTR must be submitted in writing to the curator in charge of the NDTR, or to a NHMD curator with the relevant taxonomic specialization. If the material is to be used in conjunction with an undergraduate project, a thesis or a Ph.D. project, the supervisor must ask for the loan of, and be responsible for, the material on behalf of the institution.

In general, requests for material for destructive sampling must *inter alia* contain the following information:

1. A brief project description
2. The total number of samples to be used in connection with the project, the number of samples to be used from NDTR, and the desired amount of DNA or tissue.
3. The experimental protocol to be used
4. The expected duration of the project
5. A publishing plan
6. A signed Material Transfer Agreement (MTA)

A relevant specialist curator and, where necessary, the curator in charge of NDTR will make the final decision on the distribution of material based on the following guidelines:

1. The project has a quality that justifies destructive sampling.
2. There is an adequate justification for using material from NDTR.
3. The requested taxa are adequately represented in the NDTR collection in terms of both diversity and quantity.
4. The extent to which the proposed protocol prevents future use of the material.
5. The opportunity of NHMD to get other material in exchange from the recipient or hers/his institution, if the sample is completely destroyed.
6. The user's experience and resources, including the availability of similar samples at her/his own institution, and the likelihood that the research may be performed without destroying all the material from a given sample, thus making it impossible for future uses in other contexts.
7. It is probable that the recipient's studies will contribute sufficiently to national or international research.
8. The restrictions, if any, on the requested material.
9. The possibility of returning unused material and/or DNA extractions to NDTR.
10. The duration, if any, of the period the borrower wants to restrict the availability of resulting data to the NHMD or other institutions.
11. The ability of the recipient or the recipient's institution to cover all or some of the expenses associated with the shipping and handling of the samples.

7.2 Credit

It is also a requirement that NHMD is credited for all use of the material and that all publications using NDTR material must cite the collection number(s) of NHMD, either in the form of the primary data of the collection or the number the sample has at NDTR.

7.3 Material Transfer Agreement (MTA)

MTA supplies guidelines on the use of a given sample in the research, for which the material has been supplied. All loans require a signed acceptance of a Material Transfer Agreement (MTA), which binds the receiving institution to the restrictions, if any, imposed on the material. Samples will not be sent to the

requesting institution before NHMD has received a signed MTA from the relevant researchers and/or a person who is entitled to sign such documents on behalf of the researcher's institution.

It is expected that users are familiar and comply with the laws of their own country, as they pertain to material provided by NDTR.

8. Internal Destructive Sampling

Researchers employed at NHMD are not subject to the same rules as external users but have privileged access to the use of material from NDTR. This privileged access will end no later than 3 years after the material has been deposited in NDTR, after which the material will be available to everybody under general NDTR conditions. In exceptional circumstances, this time limit may be extended. The decision will be determined in consultation between the relevant curator and the curator of NDTR. If the NDTR curator is also curator of the relevant physical collection, the extension of the time limit (3 years) will be determined in consultation between the Deputy Director of Collections and the NDTR curator.

However, the material must not be distributed to third parties, neither inside nor outside NHMD, without prior written consent, and a loan document must also be filled in when the material is requested. This loan document must describe the nature of the requested material and contain information about the conditions under which the material is intended to be stored when outside the NDTR. Any restrictions in the use of the material must be discussed with the relevant curators.

All other internal users must have their application assessed by the relevant curator as well as the curator of NDTR. The Deputy Director for Collections is the final arbiter in cases of conflicting opinions on internal destructive sampling.

9. Policy Review Procedure

It is necessary to review this policy to maintain its validity and usefulness as a guide for the museum staff and Board of Trustees. The policy will be reviewed at least once every five years by the Deputy Director for Collections, the Curator of the NDTR, the Collections Manager and the Registrar. The Deputy Director for Collections will submit proposed revisions to the Board of Trustees for final approval.

Keeping current with scientific and technological advancements and with both national and international regulations and trends, the Curator in charge of NDTR and the Registrar will continually review this policy to guarantee accurate documentation and identify if a formal review and revision is necessary before the next due date for review.

The date when the policy is next due for review is noted below.

Name of governing body: Board of Directors, Natural History Museum of Denmark

Date of approval by governing body: 18 April 2023

Date at which this policy is due for review: 18 April 2028