

Departmental Overview

Procedures for storing biosamples and managing biosample information at ABCC/RERF have, until now, been largely dependent on individual research departments. To preserve these precious biosamples, which include human blood, urine, pathological specimens, and teeth, in good condition over the long term, and to promote further research utilizing such samples, it was crucial to centralize their management and create a database for sample information. In April 2013, the Biosample Center was established to undertake this work. With the goal of clarifying radiation effects on disease and on biological and molecular changes among A-bomb survivors and their children, the Center is centralizing sample management, arranging appropriate storage for quality control, and ensuring effective use of this invaluable material, donated by A-bomb survivors, their children, and spouses. To achieve these objectives, biosamples and sample data previously stored in various departments are being moved to the Center, and samples collected in the future will also be handled and stored there with newly standardized preparation methods. In addition, sample information will be stored in an RERF database for centralized management to take full advantage of these biosamples. This database is to link to clinical and epidemiologic databases.

The 58 deep freezers and 29 liquid nitrogen tanks used for storage of biosamples are currently installed in the Hiroshima Laboratory. Because they had been filled to capacity, securing space for the biosamples became a task of the highest priority. In October 2015, to solve the space issue, we introduced a robotic deep-freezer biorepository system in Hiroshima to accommodate and effectively manage future samples, in addition to the 850,000 existing samples. The robotic biorepository system became operational in March 2016. Introduction of a robotic biorepository at Nagasaki Laboratory is also planned in the future.

Development of the Biosample Center and the Research Resource Center is the top priority of RERF for future internal and external collaborative research. An inventory of biosamples scattered among different departments and the creation of the biosample inventory database must be completed to facilitate both internal and external collaborative research. Furthermore, quality evaluation of preserved old biosamples is important to ensure the accuracy of the results obtained. There are, however, no internationally standardized indices or measurement methods of quality control of preserved biosamples, especially serum, plasma, urine, frozen live peripheral mononuclear cells and pathological samples. Furthermore, it is necessary to create regulations and procedures on sample usage for both internal and external collaborative studies. An external advisory committee will be established on the operation of the Biosample Center, evaluation of sample quality, and development of protocols for distribution of samples.

FY2017 Achievements

The position of Director of the Biosample Center is currently vacant because Dr. Kodama, the former director, was appointed as the executive director of RERF in January 2018. Dr. Tanabe from the Tohoku University will be appointed to the director of the Biosample Center in July 2018 and Dr. Imaizumi has assumed the position of acting director until then.

Inventory Management and Storage of Biosamples

- Completed inventory of 719,000 blood and urine samples of the 803,000 samples stored in departmental deep freezers and handed over their control to the Biosample Center (Hiroshima).
- Completed storage of 106,000 archive biosample tubes in the robotic freezer (Hiroshima).
- Completed inventory of about 350,000 blood and urine samples of the 490,000 samples stored in -80°C freezers or in liquid nitrogen tanks (Nagasaki).
- In FY2017, 77,833 blood samples (Hiroshima 50,500, Nagasaki 27,333) and 15,906 urine samples (Hiroshima 10,470, Nagasaki 5,436) have been newly stored in the Biosample Center (Dec. 1 2016 – Nov. 30 2017).
- Installed an additional emergency power supply for the robotic freezer in Hiroshima.

Preparation for Usage of Biosamples

- Prepared drafts of specific and detailed regulations on sample usage and a sample use request form. Summaries of the drafts are as follows.
 - “Biosample Center Operational Procedures”: Stipulate the protocols necessary for operation of the Biosample Center, including basic policy, types of subject samples and information, research protocols, safety measures, personal information management, acceptance, handling, storage, and disposal of samples and sample information, and storage periods.
 - “Biosample Center Supplementary Usage Rules for Samples and Sample Information” and forms: Determine necessary matters for utilizing samples and sample information of the Biosample Center, including basic policy, decisions on availability application for use, providing samples and sample information, handling after completion of research, notes on publication of results, withdrawal of consent, and violations. These rules also provide an application form for the use of biosamples and biosample information, details of biosamples to be used, records of use of biosamples provided, receipt of biosamples/biosample information, status report of research project, and report of disposal/return of biosamples.
- Reported recent progress of the Biosample Center at Local Liaison Council meetings to obtain understanding and support from the local community.
- Held a workshop on “Ethical considerations required in collaborative studies involving biosamples” and exchanged information with experts.