




November 2005

 **BioResource now! No.11** is here

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Bioresources information is available at the following URL:

NBRP (<http://www.nbrp.jp/index.jsp>)
 SHIGEN (<http://www.shigen.nig.ac.jp/indexja.htm>)
 WGR (<http://shigen.lab.nig.ac.jp/wgr/>)
 JGR (<http://shigen.lab.nig.ac.jp/wgr/jgr/jgrUrlList.jsp>)

Information on Resource-related Events



- December 7 - 9 **Molecular Biological Society Special Project**
 – National BioResearch Project (NBRP) Panel Exhibition (December 7–9) on the 1st floor at the Yahoo Dome
 – NBRP Symposium (December 8) Zepp Hall, on the 1st floor at the Zepp Fukuoka
- December 7 **Workshop, Molecular Biology Society of Japan (W1K)**
 "Algae: Possible Resources for Useful Substances and New Genes"
- December 13 - 15 "Technical Training for the Analysis of Intestinal Flora by the Terminal Restriction Fragment Length Polymorphism (T-RFLP) Method"
- March 9, 2006 **NBRP Symposium at Tokyo International Forum**
- March 19–21, 2006 **The Japanese Society of Plant Physiologists Annual Meeting (NBRP Panel Exhibition, etc.)**

Detailed information is available at the following
 URL: <http://www.nbrp.jp/index.jsp>

Introduction to Resource Center No. 3

Outline of the Plant Resource Activities on *Arabidopsis*, etc. (RIKEN BRC)

Masatomo Kobayashi, Head of Experimental Plant Division, RIKEN BRC

● Plant materials distributed by RIKEN BRC

- 1) *Arabidopsis* seeds (transposon-tagged lines, mutants, wild strains, related species, etc.)
- 2) Plant genes (full-length cDNA clones of model plants such as *Arabidopsis*)
- 3) Cultured plant cells (cultured cell lines of model plants such as *Arabidopsis*)

Photograph 1: (Activities of the Experimental Plant Division are conducted on the top floor) RIKEN BRC building.



RIKEN BRC
<http://www.brc.riken.jp/lab/epd/>

[1] History and Overview

The Experimental Plant Division of BioResource Center, Institute of Physical and Chemical Research (RIKEN BRC), was established in the RIKEN Tsukuba Institute in 2001 to promote resource activities of Japanese model plants. In the National BioResource Project (NBRP) initiated in 2002, this division was designated as the core facility for research on *Arabidopsis* and plant cultured cells and genes. We focus on collecting, preserving and distributing genome resources of *Arabidopsis*, the representative of experimental plant models. Moreover, in addition to distributing resources, we have been working on the development and popularization of resource-related technology and have been sponsoring technical training for culturing plant cells since 2004.

Trust, sustainability, and leadership have been the guiding principles of RIKEN BRC in its resource activities. Our division has two additional principles - internationalism and diversity. With internationalism in mind, we are linked to the global *Arabidopsis* research network as we strive to gain worldwide recognition for Japan's contribution. Consequently, 70% of the 1,100 institutes that are registered as users and a majority of the 700 institutes which we distributed resources to are located overseas. We also make a strong effort to introduce our activities at conferences and send out e-mails with resource-related information to promote our activities to the domestic scientific research community.

Although this division is less than five years old, we were awarded a special prize for our contribution to the resource maintenance of *Arabidopsis* by the Japanese Society of Plant Physiologists in September 2005. We believe that it is essential to promote research on plants to solve serious problems such as global warming and food shortage which mankind will face in the 21st century. Therefore, we will continue supporting plant researches conducted worldwide by improving the research infrastructure and contributing to society.

[2] Features of Preserved and Distributed Resource

The features of the resources in our division are that they are focused on genome resources and that the resources are handled as individual plants, cells, and genes.

After the complete decoding of the *Arabidopsis* genome base sequences, the *Arabidopsis* research community was assigned a challenging task of elucidating the functions of all genes that were predicted to exist and research has been carried out vigorously mainly in Japan, USA and the European nations. As the primary step toward achieving this goal, full-length cDNA clones that correspond to entire genes and disruption strains (transposon-tagged lines) were produced, and a system to distribute information on genome resources available at the BioResource Center was established. Along with the *Arabidopsis* Biological Resource Center (ABRC) in USA and the Nottingham *Arabidopsis* Resource Center in England, our division is one of the centers that distribute these genome resources all over the world. In particular, our RIKEN *Arabidopsis* full-length (RAFL) cDNA clones are distributed as standard resources to plant researchers all over the world. Although the genome resources of *Arabidopsis* has a big influence over the genome researches in the world, resource centers face many difficulties such as the scale of resources being extraordinarily large, the need for technical know-how to efficiently yet reliably handle the resources and the necessity for intellectual property rights to be managed carefully because of the huge developmental costs. In order to play an important international role as a bioresource center, we hope to overcome these problems and conduct our activities in the manner that can be trusted by both depositors and users.

The feature mentioned earlier about resources being available in the form of individual plants, cells and genes, encompasses an important aspect for catering to various requirements of researchers. For example, the tobacco BY-2 cells and Arabidopsis T87 cells are known worldwide as standard strains and the demand for them is rapidly increasing. They are used as experimental lines for analyzing certain phenomena in cells which cannot be observed in individual plants. A remarkable feature of our division is that unlike our counterparts in USA and England as mentioned above, our resource activities include cells. Although the maintenance of various resources requires a great deal of labor, a large ramification of these resources can be expected. Therefore, we wish to steadily continue our efforts to support researches.



Photograph 2: Arabidopsis is used as a model experimental plant all over the world since it is a small individual, has a short life cycle, and can grow in a laboratory environment. Many wild strains of Arabidopsis, which have adapted themselves to various environments, were collected from all over the world. A typical strain of Arabidopsis has been preserved and its characteristics have been analyzed in this division. The transformation lines of Arabidopsis can be established within several months, much shorter than that required for other crops. Therefore, Arabidopsis is also used for functional analysis of crop genes recently.



[3] Familiarizing Researchers with the Resource Center

Collection, preservation, and distribution are the most important activities of a resource center. However, if a resource center limits itself to these activities alone, it would be difficult to maximize the usefulness of resources. For example, our efficiency will be limited if information relevant to the resources is not accumulated or distributed, or if techniques for handling resources are not developed or taught, or if fresh resources for future research are not obtained. Besides the collaboration with NBRP, RIKEN BRC has been conducting independent activities such as developing resource-related technology, spreading handling techniques through training, and developing fresh resources in cooperation with external organizations. In conjunction, our division has been developing and popularizing handling technique for cultured plant cells, improving the technology in the use of Arabidopsis wild strains and developing genome resources of brassicaceous plants. A basic course in culture technique and an application course in phenotypic transformation and cryopreservation were held during a training session on cultured plant cells and both courses were well received.

Although the national research infrastructure has developed a great deal after the NBRP was established, we still need to strive for the significance of this resource center to be recognized by the research community. Therefore, in addition to distributing resource-related information and responding to inquiries from researchers, we will strive to develop new resources, technology and information through various resource-related activities and provide them to the research community in hopes of familiarizing ourselves to the researchers.



Photograph 3: T87 cells are the typical cultured cells of Arabidopsis. They are used not only for research on signal transduction and investigation of protein localization but also for research on the circadian rhythm and photosynthesis because the development of chloroplasts can be observed in the light green T87 cells. In order to persuade more researchers to use T87 cells, our division has been developing and popularizing the technology of the transformation and cryopreservation of T87 cells.

Announcement of the Next Issue



Special edition on mice!

Experimental Animal Division,
RIKEN BRC

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Information Technology

Vol. 9

"Bioinformatics"

"Install BLAST"

Researchers in biological fields would be familiar with the name BLAST or would have used it somewhere. Would you like to install this popular program, BLAST on your pc and execute it?

1

(1) Please create a folder named BLAST in C:\Program Files or any other directory.

2

Please download blast-2.2.12-ia32-win32.exe from <ftp://ftp.ncbi.nih.gov/blast/executables/release/2.2.12/> and put it in the Blast folder created in step (1) and double-click on it.

3

The BLAST folder will contain folders named "bin," "data," and "doc". Please assign a path to the bin folder.

*If you do not know how to assign the path, please search for the procedure using Google or other search engines as I will not be explaining that.

```

C:\WINDOWS\system32\cmd.exe
C:\>blastall

blastall 2.2.12 arguments:
-p Program Name [String]
-d Database [String]
  default = nr
0 = pairwise,
1 = query-anchored showing identities,

```

Execution result of blastall

The BLAST folder will contain folders named "bin," "data," and "doc". Please assign a path to the bin folder. Actually, Blast can be executed even if the path was not assigned. Please try by opening a command prompt (Start → Program → Accessories → Command Prompt) window. Drag and drop blastall.exe from the bin folder to the black screen, and press the Enter key. BLAST (blastall) should be executed, and various options should be displayed on the screen.

If you want to confirm the assignment of the path, please open a command prompt window again, type "blastall," and press the Enter key. If the same screen is displayed, the path has already been assigned.

A software program called BlatStation (<http://www.blaststation.com/ja/index.html>) can execute BLAST through a GUI (graphical user interface). Please try various software programs that can be executed with BLAST.

Written by Shingo Sakaniwa

Editor's notes : The Experimental Plant Division, RIKEN BRC has grown to become a role model for plant resource activities although it has been less than five years since it was established. Although the Arabidopsis research community seems to be able to work without much financial restraints unlike the commercial plant researchers, it is clear that this is due to Dr. Kobayashi, the Head of the Experimental Plant Division, who has been contributing to the improvement of the research infrastructure through his continuous efforts. (Y. Y.)

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