



BioResource now! No. 10 is here

- Information on Resource-related Events :
- Introduction to Resource Center No. 2 :
"Cell Bank RIKEN BioResource Center"
- Hot News from Abroad No.7 :
"FIMRe (Federation of International Mouse Resources) "
- Hot News from Abroad No.8 :
"Introduction to the Present Status of Laboratory Animal Science in China and the Shanghai "
- Ongoing Column Vol. 8:
"3. Search Engine Optimization (SEO) - Final Edition "

Download the PDF version of this newsletter at
<http://www.shigen.nig.ac.jp/shigen/news/news.jsp>

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



- "Technical Training for the Transformation and Preservation of Plant Cultured Cells" Schedule: November 7 - 9
- "International Symposium on Standardization of Genetic Resources of *Oryzias latipes*" Schedule: November 14 - 15
- "A Special Project of the Molecular Biological Society"
Schedule: December 14 - 15
 - NBRP Panel Exhibition (December 7-9)
 - NBRP Symposium (December 8)
- "NBRP Symposium at the Tokyo International Forum" Schedule: March 9
- "Technical Training for the Analysis of Intestinal Flora by the Terminal RFLP Method"
Schedule: December 13 - 15
- "The Japanese Society of Plant Physiologist Annual Meeting (NBRP Panel Exhibition etc.)" Schedule: December 13 - 15

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



Introduction to Resource Center No. 2

Outline of the Cell Bank Activities (RIKEN BRC)

Yukio Nakamura, head of Cell Engineering Division, RIKEN BRC

● Samples currently distributed by RIKEN BRC Cell Bank

- 1) Human cell lines
- 2) Animal cell lines
- 3) Human cord bloods
- 4) Human mesenchymal stem cells
- 5) Human B cells: Epstein-Barr virus (EBV) transformed cells

Cell Bank RIKEN BRC
<http://www.brc.riken.jp/lab/cell/>

Introduction

The Cell Engineering Division of the BioResource Center in the Institute of Physical and Chemical Research (RIKEN BRC) serves as a cell bank and carries out tasks such as collecting, inspecting, standardizing, maintaining, quality controlling, and distributing cell materials derived from human and animal sources, for the purpose of promoting life science research (<http://www.brc.riken.jp/lab/cell/>). Since we started in 1986, in addition to functioning as a cell bank, we have been conducting developmental research on new cell materials and gathering related information, and have been working towards promoting the techniques for handling these materials. Moreover, in recent years, we have included human-derived normal cells such as stem cells and primary cells into our administration with the aim of promoting researches in embryology, transplantation therapy, regenerative medicine and other fields. As the latest developmental activity, we are trying to improve the technology to acquire, establish, maintain, preserve and cultivate embryonic stem cell lines, high-order function maintained cell lines and human-derived nutritive cells. The Cell Engineering Division was designated as the resource center for the cell (animal culture cells, cancer cells, etc.) department of the National BioResource Project funded by Ministry of Education, Culture, Sports, Science and Technology (MEXT) in 2002 and later, for human cell department too in 2003. We are playing an important role in preparing cell materials in Japan.

There are eight departments in RIKEN BRC besides the cell department such as the animal, plant, gene, microbe and information department (<http://www.brc.riken.jp/>). In order to be the base of all life science researches from fundamental researches to applied researches, our motto while developing and maintaining resources is "Reliability, Sustainability and Leadership". We are constantly striving to improve the intellectual infrastructure in Japan.

【1】 Cultured Cell Lines

After our initiation in 1986, we have been collecting materials related to various cell lines and the number of accumulated cell line materials has exceeded 2000. In 2003, the Cell Resource Center for Biomedical Research which is part of the Institute of Development, Aging and Cancer, Tohoku University, was designated to be a subsidiary organization for the "human cell" department of the National BioResource Project. The human-derived cell lines that were collected, stored, and distributed there were transferred to our division. We have started the process of culturing, preserving and distributing these cell lines. Once the preparations are made, we will be temporarily releasing the cell lines available for distribution on our website (<http://www.brc.riken.jp/lab/cell/>).

We have been distributing 50 - 60 ampoules a week and a total of approximately 3,000 ampoules per year. Although the recipients were mainly from Japan, approximately 10% of the ampoules were distributed overseas. Moreover, although the recipients were mainly nonprofit research organizations such as universities, approximately 20% of the ampoules were distributed to private research organizations such as companies. The numbers of domestic and foreign recipient organizations has reached nearly 1,000 and 600, respectively.

[2] Human Cord Blood

There is a possibility that various somatic stem cells besides blood stem cells are contained in the marrow (References 1*, Fig. 1). However, it is not easy to obtain human bone marrow cells. On the other hand, it is known that the frequency of finding blood stem cells in the cord blood is higher than in the bone marrow (Fig. 2). Moreover, there is a possibility that various somatic stem cells other than the blood stem cells are contained in the cord blood (Fig. 1). Furthermore, it was shown that the blood stem cells may differentiate into other types of cells (Fig. 3). Therefore, cord blood has great potential as a research material in regenerative medicine.

Note: Reference information is available only in the web edition

Fig. 1 Stem cells that may exist in the bone marrow

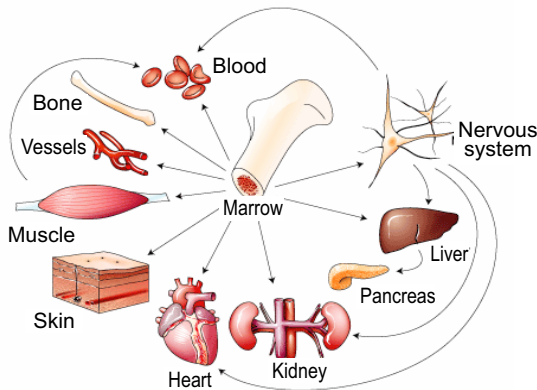


Fig. 2 Applications of cord blood

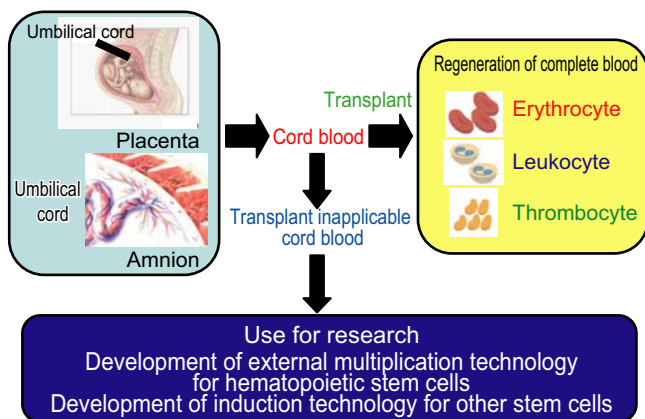
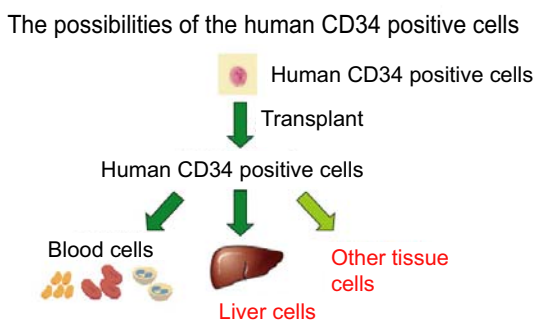


Fig.3 Applications of human CD34 positive cells



Our research is conducted in collaboration with a leading project of MEXT, "Realization of Regenerative Medicine Project - Stem Cell Bank Preparation for Research Use," and we are assisted by the Stem Cell Bank of Tohoku University, the Stem Cell Bank of Institute of Medical Science of The University of Tokyo (IMSUT), the Research Resource Bank of Tokaido University, the Stem Cell Bank of Nagoya Medical Center and the Hyogo Stem Cell Bank.

The use of cord blood cell samples is restricted to researches dedicated to developing regenerative medicine. The approval of the ethical review committee of the recipient organization and also an authoritative permission are required for the use of these samples and therefore, written documents should be prepared before placing an order. Although distribution of these materials is now limited to only domestic nonprofit institutions, distribution to domestic profit-making institutions is being arranged in conjunction to the "Realization of Regenerative Medicine Project - Stem Cell Bank Preparation for Research Use".

[3] Human Mesenchymal Stem Cells

A mesenchymal stem cell is a type of somatic stem cell that can differentiate into a bone cell, cartilage cell, adipose cell or other kind of cells (References2-11*, Fig. 4), and it has been reported that it can differentiate into a cardiac muscle cell, vascular endothelial cell or nerve cell, etc. (References2-11*, Fig. 4). Therefore, mesenchymal stem cells attract considerable interest as research material in the field of regenerative medicine, like the somatic stem cells in cord blood mentioned above (Fig. 5).

These cells are collected, stored, and distributed in collaboration with the Graduate School of Biomedical Science, Hiroshima University Graduate School (Dr. Yukio Kato) and the National Research Institute for Child Health and Development (Dr. Akihiro Umezawa).

The approval of the ethical review committee of the recipient organization and the permission of an authorized representative of the organization are required for the use of these cells. Therefore, written documents should be prepared before placing an order.

Fig. 4 Applications of mesenchymal stem cells

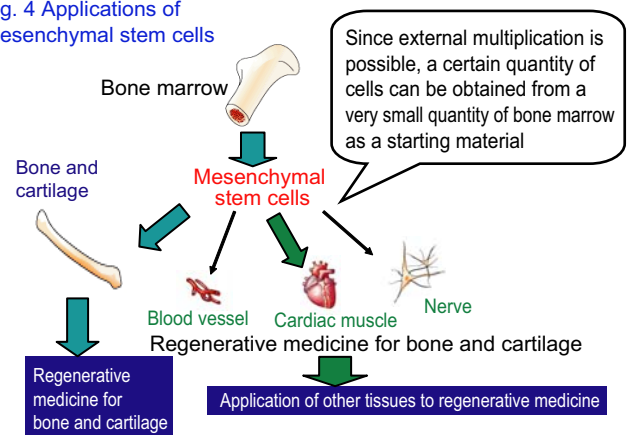
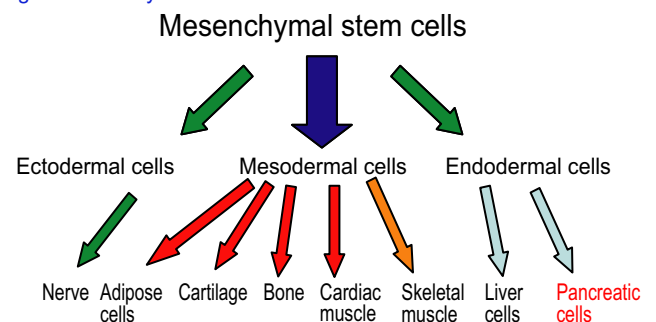


Fig. 5 Mesenchymal Stem Cell Differentiation



[4] Human Immortalized Cells (EB Virus Transformed Human B Cells)

These cells are mainly used as a genome incubator, and in this post-genome age, they are essential to various research fields such as human genetics and disease genes.

The cell bank activities with regard to EB virus transformed human B cells are being carried out in collaboration with the Frontier Center, National Institute of Radiological Sciences (Dr. Takashi Imai). In addition, we are maintaining EB virus transformed human B cells derived from various races along with those derived from Japanese people together with the Graduate School of Medicine, Dentistry and Pharmaceutical Science, Kagoshima University (Dr. Toshiro Sonoda and Dr. Naomichi Arima).

[5] Ethical Problems Regarding Human Cell Material Handling

The human cell materials that we handle are examined by the Research Ethical Committee of RIKEN Tsukuba Institute which is based on the "Ethical Guidelines for Research on Human Genome and Gene Analysis (Ministry of Education, Culture, Sports, Science and Technology, Ministry of Health, Labor and Welfare, and Ministry of Economy, Trade and Industry)" and "Ethical Guidelines for Epidemiological Research (Ministry of Education, Culture, Sports, Science and Technology and Ministry of Health, Labor and Welfare)". Only those approved by the committee will be handled by this bank.

When a human cell material is deposited or transferred to this division, we check to see if it has met the approval of the ethical committees of both the organization that collected it and the organization which deposited or transferred it based on the abovementioned guidelines.

With regard to the distribution of human cell materials, we provide materials after receiving proof of approval from the ethical committee of the recipient organization if it is required. At present, the approval of the ethical committee of the recipient organization is required to use the human cord blood and human mesenchymal stem cells. Therefore, proof of approval should be prepared before placing an order.

[6] Cell Materials Quality Control

We have confirmed that all cell materials that we are distributing are free of mycoplasma contamination. We employ the short tandem repeat polymerase chain reaction (STR-PCR) method, a kind of genetic polymorphism analysis method, to improve the human-derived cell lines discrimination, and we examine every human-derived cell lines that we distribute. The results of these analyses can viewed at <http://www.brc.riken.jp/lab/cell/>.

Cell Bank, RIKEN BRC

<http://www.brc.riken.jp/lab/cell/>



[7] Technical Development of New Cell Materials

We are working to improve the technology of mass culture and induction of in vitro differentiation of marmoset ES cells and Macaca fascicularis ES cells. Moreover, for clinical application of ES cells, it is essential to use human-derived nutritive cells instead of those derived from mice. Therefore, we are also working towards establishing human-derived nutritive cells in order to meet the future demand for these cells. We are using stem cells that exist in tissues associated with the fetus such as the placenta, the amnion, and the umbilical cord as original materials.

[8] Culture Facility Conforming to Good Manufacturing Practice (GMP)

The culture facility is maintained in accordance to the Good Manufacturing Practice (GMP) requirements for culturing human stem cells. At present we use this facility to culture human mesenchymal stem cells, human blood stem cells, etc., and we aim to carry out bank activities related to human embryonic stem cells (human ES cells) in the future.

(Note: Bank activities for human ES cells require an alteration in the government policy and an approval from the government)

[9] Questions regarding the cell deposition procedure, the cell distribution procedure, the cell culture method, etc.

Questions regarding our activities or cell culture are accepted via e-mail at cellqa@brc.riken.jp. You can also contact us at this address if you wish to subscribe to our periodical electronic newsletter.

Conclusion

The cell bank activities are supported by researchers who deposit or transfer cells. Your cooperation in the deposition or transfer of cells is highly appreciated. We consider aiding the development of life science researches with our activities as a way to repay the abovementioned researchers, or in the case of human-derived cells, patients or healthy volunteers who donated their cells. Here, we would like to express our respect and gratitude to all cell donors and hope that the research would benefit all the researchers and patients who require these cells.

Announcement of the next newsletter



Special edition on
Arabidopsis thaliana!

RIKEN BRC Experimental Plant Division



Hot News from Abroad No.7

FIMRe

(Federation of International Mouse Resources)

The third FIMRe Meeting was held on October 9 - 10 in Besesda, USA. The fourth meeting will be held in Tukuba, Japan. The report on the third meeting is shown on the RIKEN website at <http://www.brc.riken.jp/inf/news/gmnet3.shtml>.

**Hot News from Abroad No.8****Introduction to the Present Status of Laboratory Animal Science in China and the Shanghai Laboratory Animal Center****Ping XU****Professor at Shanghai Institute for Biological Science, Chinese Academy of Science (Guest Professor at the Center for Animal Resources and Development, Kumamoto University)**

Prior to 1980, laboratory animals in China were bred in the so-called conventional state where air-conditioning systems and control of pathogenic microbes did not exist. However, since 1980, the management system has improved rapidly especially the breeding of mice and rats which has achieved the SPF level. Moreover, laws concerning the management of laboratory animal breeding, breeders and licenses were enacted by the Chinese government causing the conditions of the laboratory animals to improve rapidly in these 20 years. Furthermore, national centers for rodents, apes, chickens, dogs, rabbits, etc. have been established in various places in China .



Shanghai Laboratory Animal Center, CAS

The Shanghai Laboratory Animal Center in Chinese Academy of Science which breeds mice and rats in particular, has research facilities and various animal breeding buildings in its large premises (plottage: 6,500 m²) and a staff of more than 120 personnel are

employed at this facility. The number of animals that have been bred has been increasing each year. Approximately 700,000 mice are bred and distributed all over China . With regard to the reproduction technology for mice, a joint research with the Center for Animal Resources and Development (CARD), Kumamoto University , is being conducted, and a bank for embryos, sperms,

etc. is being established. In the future, this center will play the role of a resource center for genetically manipulated mice.



Corridor of a building used for animal breeding



Isolation room for mice



Rooms for rabbits, rats, and mice



* These photographs were provided by Professor Ping XU

Editor's notes: The series on RIKEN BioResource Center has just started. Dr. Nakamura, the head of Cell Engineering Division, contributed an introductory article on the center which focuses on human stem cells, the most distinguished research in the field of regenerative medicine. We would like to express our sincere thanks for his contribution. We realized that the national resource center in China has developed remarkably in the past 20 years. Young researchers who were educated abroad took initiatives and this contributed to the rapid improvement in scientific researches. (Y. Y.)

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**Information Technology**

Vol. 6

"3. Search Engine Optimization (SEO)"

I mentioned how important search engines are to us website administrators in my last 2 articles. In this issue, I will talk briefly about search engine optimization (SEO) which can be used to improve the ranking of your website.

1. TITLE Tag

The contents of the TITLE tag in HTML will be displayed as the title of your webpage and it will be registered as the title when your page is bookmarked. A search engine considers this title very important. It would improve the search ranking of your website if you include relevant keywords to the title.

2. H1 Tag

The HTML Hn tag (n being a number from 1 to 6) is used for the heading. You can assign values from 1 - 6 to it, with h1 tag being the biggest. The <h1> tag is considered important by a search engine.

3. Link Popularity

A search engine grades how good a website is by this criterion; "a useful site will be linked more from other sites." Therefore, if many other websites link to your website, your search ranking will improve.

**Conclusion**

You will find many websites with information on search engines if you do a search on "SEO". Some hints regarding how to improve your ranking or increase your access number are available on these sites. The most important thing is that you continuously improve the quality of your website. With the feedback from our users, we hope to continuously improve our website and turn it into an interesting website with an excellent reputation.

How to avoid from being considered as SPAM

If you try to improve the ranking of your website by dishonest means, your site may be recognized as SPAM by search engines. This would lower the ranking of your website or your website may not be included in any hits. Common SEO scams are "hidden text" and "link farm". The method of hiding many keywords written in the same color as the background or in a very small font is called hidden text. A link farm is any group of web pages that all unnecessarily hyperlink to every other page in the group to improve their search ranking.

Be careful not to overdo SEO and end up being recognized as SPAM.

(Reference: Perfect plan to increase homepage access)

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