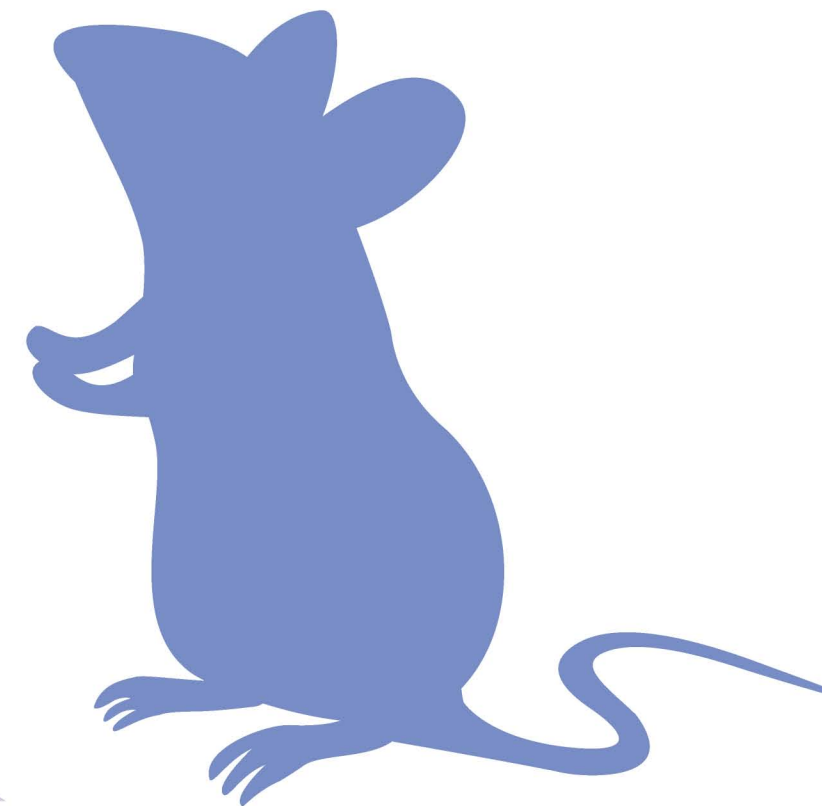
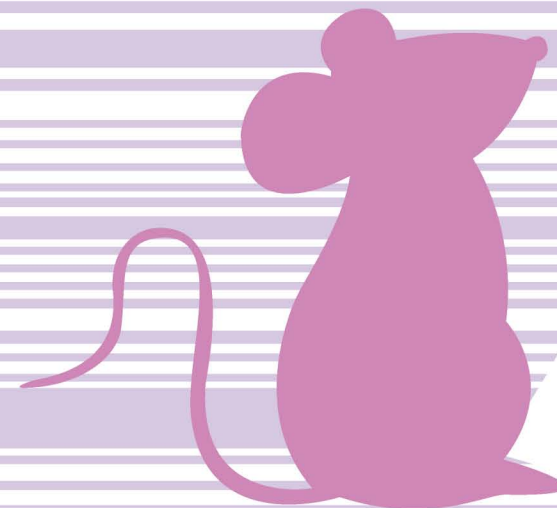


2012 AMMRA Annual Report

# AMMRA Annual Report

2012

<http://www.ammra.info/>





# **AMMRA**

# **Annual Report**

**2012**



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## AMMRA, the Past and Future

### President – Dr. Xiang Gao



*AMMRA services as a strong bondage for us all. Personally, I wish to express my appreciation to Dr. Ken-ichi Yamamura for his vision and tremendous efforts over last 6 years. Of course I am also in debt to all members in AMMRA for the achievement of AMMRA. Nothing can be achieved without your hard work and enthusiasm. And with your continuous support, AMMRA will overcome all difficulties.*



Aiming the functional annotation of all mammal coding genes, several key institutes for mouse genetic research in EU, American and Canada formed the International Mouse Knockout Consortium (IMKC) in 2006. Unfortunately, Asian countries were left out of circle. This fact prompts us to consider establish a multinational organization for promoting the mouse mutagenesis in Asia. In November 22, 2006, Shanghai Institute of Life Science of Chinese Academy organized a special workshop for launching the Asian Mouse Mutagenesis and Resource Association (AMMRA) at Shanghai. More than 40 scientists from China, Japan, Korea, Taiwan, and Singapore attended this meeting and agreed on the needs for establishing AMMRA. AMMRA mission is “to promote mouse mutagenesis projects and to facilitate access to mouse resources in Asia”. The founding members include following institutes: 1) Center for Animal Resources and Development, Kumamoto; 2) Biological Resource Center, Singapore; 3) National Laboratory Animal Center, National Applied Research Laboratories, Taipei; 4) National Resource Center for Mutant Mice, Nanjing University, Nanjing; 5) Shanghai Institute of Biological Sciences, Shanghai; 6) Shanghai Research Center for Model Organisms, Shanghai; 7) Peking University- BLARC, Beijing, 8) Beijing Institute of Laboratory Animal Science, CAMS, PUC, Beijing; 9) Bio-Evaluation



Center, KRIBB, Daejeon; 10) Riken BioResource Center, Tsukuba. Most of these institutes are key resource centers in the region. Dr. Kenichi Yamamura from Kumamoto University, the chairman of the workshop, was elected as first president of AMMRA.

Subsequently, AMMRA annual meeting was held at NRCMM at Nanjing in 2007, KRIBB at Daejeon in 2008, CARD at Kumamoto in 2009, NLAC NARLabs at Taipei in 2010, BRC at Singapore in 2011, and NRCMM at Nanjing in 2012. At early years, AMMRA activities were mostly focused on the communication among the resource centers. Eventually, these resource centers started to hold joined the education program on mouse related technologies. For instance, CARD had held training classes for cryopreservation in Shanghai and Beijing in 2009 and 2012. The mouse pathology workshop held by NLAC NARLabs and Johns Hopkins University was opened to all AMMRA members in 2010. Moreover, MARC of Nanjing University and BRC RIKEN agreed to establish a joined international short course series for mouse research. This short course covers broad range of content in mouse genetics, from history of mouse research to genetic manipulation, disease model phenotyping, stem cell and cloning, cryopreservation, mouse colonial management. The first class was held in BRC RIKEN in July 2012. And the second class is scheduled in MARC, Nanjing in July 2013.

To further enhance the solid collaboration for generating, preserving and distributing mouse resources among members, AMMRA outlined the policies and charters of the association, such as the definition, mission, goal, purpose, structure, and governance at the 5th conference in Taipei in November 2010. At the 6th conference organized in Singapore on November 2011, IT committee (Dr. Masuya at RIKEN BRC serves as the chair) and annual report committee (Dr. Wang from NLAC NARLabs in Taipei serves as the chair) were formalized. Currently, an integrated database of mouse strains in Asian is under construction and the first annual report of AMMRA is published in 2013.

The AMMRA activity also facilitated the birth of Asian Mouse Phenotyping Consortium (AMPC). In September 23rd 2011, the International Mouse Phenotyping Consortium (IMPC) kicked off at NIH. The ambitious ten years project is aimed to systematically phenotype KO strains generated using ES cell lines developed by IKMC.



Both RIKEN BRC in Japan and MARC in China became the IMPC member in 2011. In summer of 2012, Korea also joined the IMPC and NLAC in Taiwan will follow soon. In accordance with the IMPC pipeline, AMMRA members began to discuss additional functional screening for better utilizing the existing phenotyping platform in China, Japan, Korea and Taiwan. These discussions eventually led to the inauguration of the AMPC at Taipei in 2010. All large phenotyping centers, including NLAC NARLabs in Taiwan, MARC/NRCMM in China, IDB of Fudan University in China, KRIBB in Korea, and RIKEN BRC in Japan are founding members of AMPC. In March 2012, AMMRA and AMPC held joint annual meeting in Nanjing, attracted more than 100 participants.

I believe the most important question is whether AMMRA can continuously fulfill its role in future. With the new genome manipulation technologies, such as ZFN, TALEN and CRISPR-Cas, mutant mice are generated much easily today. How do we get these strains' information more accurate and faster? Where can we find better service center for making these disease models? We are still not even close to satisfy ourselves.

Another crucial issue for AMMRA is that how AMMRA will take concerted action with the IMPC. The current IMPC pipeline is focused on only gene functional annotation, not clinic or pharmaceutical applications. For instance, the challenge model or aging model is not included in the standard IMPC assay. Nevertheless, these assays may post the most crucial clinic application. Should the AMPC and AMMRA work together to solve the problem and initiate the new pipeline?

And at last, the training issue. Currently, most the training courses are provided and managed by individual institute, is it possible AMMRA serves as a coordinator for promoting these courses as well as make them more suitable for systematic studies? Indeed the earth is becoming flat. And we are all become close friends thorough the AMMRA activities. This annual report just signatures the new beginning of bright future of Asian mouse research.





## Welcome Address

### Honorary Former Chair – Dr. Ken-ichi Yamamura



*Dear AMMRA members,*

*AMMRA started in 2006. Since then, there were dramatic changes in terms of production, cryopreservation, supply and phenotyping of genetically engineered mice. To promote life sciences in Asia, it is essential to trust, help, and cooperate with each other. I believe that initial phase is successful through the activities of AMMRA. Let's move on to the growth phase of AMMRA.*

*Kenichi Yamamura*

## Welcome Address

### Vice President – Dr. Yuichi Obata



*The mouse is the most sophisticated experimental animal among many species. By the scientific endeavors over 100 years, many inbred mouse strains have been established, DNA sequence of a whole genome was determined and the methods for modification of genes and manipulation of embryo have been developed. The disadvantage in the mouse as an experimental animal is its high cost of rearing. Due to this disadvantage, the science using the mouse was much delayed in Asia when compared with that in North America and Europe. However, in the last decade or so, significant social and scientific advancement and improvement were made in Asia. It is time for Asian scientists to be in the front line of science. To accelerate this movement in Asia, AMMRA was established.*

*There are many issues to be solved for AMMRA. Examples are how to ensure easy access to mouse strains held by AMMRA members, improve technologies, harmonize quality control of mouse strains, and train and educate of staff in the member institution. It would be very difficult for a single institution to solve all these issues, but it may be possible as an association if there are collaborative efforts among member institutions.*

*As a vice president of this association, I do my best to help the AMMRA president, Dr. Gao and each member institutes to accomplish the common goals of AMMRA by solving issues stated above.*

A handwritten signature in black ink that reads "Yuichi Obata". The signature is written in a cursive, flowing style.



## AMMRA Members

- ✧ Biological Resource Center, Singapore (Founding member)
- ✧ Center for Animal Resources and Development, Kumamoto (Founding member)
- ✧ Institute of Developmental Biology and Molecular Medicine of Fudan University, Shanghai
- ✧ Institute of Laboratory Animal Science, Chinese Academy of Medical Sciences, Peking Union Medical College, Beijing (Founding member)
- ✧ Laboratory Animal Resource Center, KRIBB, Ochang (Founding member)
- ✧ Laboratory of Cardiovascular Genomics of Ewha Woman's University, Seoul  
Nanfang Center for Model Organism, Shanghai (Founding member)
- ✧ National Institute of Food and Drug Safety Evaluation, Seoul
- ✧ National Laboratory Animal Center, National Applied Research Laboratories, Taipei (Founding member)
- ✧ National Resource Center for Mutant Mice, Nanjing University, Nanjing (Founding member)
- ✧ Peking University-Beijing Laboratory Animal Research Center Mouse Genomics Center, Beijing (Founding member)
- ✧ Peking University-Beijing Laboratory Animal Research Center Mouse Genomics Center, Beijing (Founding member)
- ✧ Riken BioResource Center, Tsukuba (Founding member)
- ✧ Seoul National University, Seoul
- ✧ Shanghai Laboratory Animals Center, Shanghai Institute of Biological Sciences, Shanghai (Founding member)
- ✧ Sookmyung Women's University, Seoul
- ✧ Yonsei University, Seoul



## AMMRA Charter

### Definition

The Asian Mouse Mutagenesis and Resource Association (AMMRA) is a collaborative group of the development, archiving/distribution, coordination of phenotyping and informatics of mutant mice in Asia.

### Mission

To promote and coordinate the development, archiving/distribution, phenotyping, and informatics of mutant mouse, and to facilitate access to mouse resources in Asia

### Goal

Use of mouse models for understanding the genome function and improvement of human health

### Purpose

1. AMMRA is an international organization whose members, in a manner consistent with the governmental obligations and legal responsibilities of each, pledge to:
  - (1) facilitate the use of mouse resource and research centers across national boundaries and barriers in Asia;
  - (2) commit to cooperative, standardized approaches to the development, archiving/distribution and quality control of mouse models;
  - (3) establish commonly shared principles on operation control as regards to animal health, genetics and environmental management;
  - (4) work cooperatively to facilitate access to and utilization of available resources, services, and expertise in all aspects of the development, archiving/distribution, coordination of phenotyping and informatics of mouse models
2. AMMRA's goal is to facilitate the use of mouse models of human disease, behavior and development for the benefit of researchers in biomedical field.

### Structure and Governance

1. The primary criterion for admission to AMMRA institutional membership is each

member must be a mouse repository or mouse research facilities, supported by the national government, which has an independent, sustainable operating budget, and dedicated infrastructure and resources. The applicant organization must also agree to the AMMRA's principles of operations, and actively participate in AMMRA operations. Commercial membership is also available based on the merits of the applicant company in compliance to the AMMRA's principles and with support to AMMRA activities.

2. AMMRA is governed by the members of Board of Directors (BOD) including president and vice president, comprised of the institutional members of each Asian country / region.
3. The Board of Directors is responsible for developing strategic and financial plans and, when appropriate, will appoint committees to address specific goals. It is responsible for:
  - (1) convening at least one meeting annually
  - (2) electing officers
  - (3) considering additions and eliminations of the membership
  - (4) ensuring to maintain the web site
  - (5) empowering educational activities
  - (6) adopting the standards of operation agreed upon in committee
  - (7) preparing amendments to the AMMRA Charter
  - (8) fund raising with governmental, industrial and private funding agencies and academic institutions
  - (9) overseeing the ultimate dissolution of AMMRA
4. President of AMMRA is elected by the members of Board of Directors (BOD). The term of President is 2 years and takes turns to be selected from different area.
5. The Vice-President is nominated by the president. The President and Vice-President are responsible for the activities and finances of AMMRA, with the concurrence of the BOD.
6. Prospective member organizations must make application through the BOD of the relevant area. The Vice-President will assist in preparing the case for admission, bring it to the convened AMMRA Board, and shepherd it through to a vote. Elimination of a member organization will proceed in a similar fashion with the BOD of the relevant area moving for elimination.
7. Although consensus on all matters will be sought, practice dictates passage of all votes by a half majority, provided a quorum is present.

**Head office**

President's institution

**Website**

<http://www.ammra.info/>

**Membership****1. Institutional membership:**

Annual fee: \$1,000 USD

Duty:

- (1) Providing information on their resources
- (2) Sharing mice resources
- (3) Support to expanding professional techniques in mouse biology
- (4) Providing annual report according to AMMRA forms

**2. Individual membership**

Open to mouse scientists in Asia

**Integration of AMMRA into IKMC**

AMMRA as a whole is integrated into IKMC

**Terms of Reference**

The role of the Steering Committee is to provide oversight of and to facilitate coordination between international efforts in the generation of knockout mouse resources. Specifically the Steering Committee will:

1. Promote coordination of the international efforts through the sharing of production plans (such as gene lists, plans for mouse production, etc.) and production status to minimize unnecessary redundancy;
2. Promote maximum efficiency in the generation of mouse-gene knockouts by ensuring the sharing of information regarding new approaches and technologies developed during the programs;
3. Ensure free and open release of data and resources generated;
4. Promote dissemination of knowledge, tools, policy and best practice in the field of mouse genomics;
5. Promote coordination on issues such as archiving and distribution to ensure the data and resources generated are readily accessible to the scientific community;
6. Promote discussion of future strategy for mouse functional genomics;

7. Coordinate public communications regarding individual efforts or the international effort as a whole.

**Advisory Board**

Advisory Board members will be invited from global society in the field of mouse genetics and other related field.



## AMMRA Organizations

<b>President</b> (Term 2012-2014)	Xiang Gao, NRCMM
<b>Vice-President</b> (Term 2012-2014)	Yuichi Obata, Riken BRC
<b>BOD from Institutional Members</b>	Kumamoto University Riken BRC Nanjing University KRIBB BRC NLAC NARLabs
<b>General Secretary and Treasurer</b>	Je Kyung Seong, SNU
<b>IT Committee</b>	Hiroshi Masuya, Riken BRC (Chair) Arun Kumar Manickam, BRC Ki-Hoan Nam, KRIBB Xiaojun Lei, NRCMM Hsian-Jean Genie Chin, NLAC NARLabs Yukiko Yamazaki, NIG
<b>Annual Report Committee</b>	Chi-Kuang Leo Wang, NLAC NARLabs (Chair)







## **Briefing from Member Institutions**





Biological Resource Centre, A-STAR, Singapore	
Institute Director/ President	Dr. Lim Juay Yong
AMMRA contact person 1	Dr. Sathivel Ponniah
Phone	(65)6478 8568
E-mail	Ponniah_sathivel@brc.a-star.edu.sg
AMMRA contact person 2	Manickam Arun Kumar
Phone	(65)6478 8575
E-mail	arunkumar@brc.a-star.edu.sg
Mailing address	Biological Resource Centre, 20 Biopolis Way #07-01 Centros, Singapore 138668
Institute address	Biological Resource Centre, 20 Biopolis Way #07-01 Centros, Singapore 138668
Website	<a href="http://www.brc.a-star.edu.sg">www.brc.a-star.edu.sg</a>



## Biological Resource Centre, A-STAR, Singapore

### Institution Briefing

Biological Resource Centre (BRC) started its operation in 2005. It was set up to serve the laboratories of the A-STAR institutes to meet their research-related animal requirements.

BRC houses mice, rats, guinea pigs, rabbits and mini pigs. One of its main functions include basic husbandry of these animals and providing an optimal environment such that the external factors influencing the researchers' work is minimized.

BRC offers scientific services and these include microinjection of DNA and ES cells in mice, cryopreservation of mouse spermatozoa and embryos and rederivation of mice into SPF.

BRC would like to share its available mutant strains with the AMMRA community and is working with the respective researchers to obtain their approval, while at the same time benefit from the other available strains from the AMMRA members.



Center for Animal Resources and Development, Kumamoto	
Institute Director/ President	Urano Toru
AMMRA contact person	Ken-ichi Yamamura
Phone	+81-96-373-6596
Email	<a href="mailto:yamamura@gpo.kumamoto-u.ac.jp">yamamura@gpo.kumamoto-u.ac.jp</a>
Address	2-2-1 Honjo, Kumamoto 860-0811, Japan
Website	<a href="http://card.medic.kumamoto">http://card.medic.kumamoto</a>



## Center for Animal Resources and Development, Kumamoto



### Part I – Institution Briefing

- The CARD is located at Honjo campus, Kumamoto University which is one of the government-funded non-profit national university corporation and was established in 1998 according to recommendations published in the report “Preservation, Supply and Development of Genetically Engineered Animals” by the Ministry of Education, Culture, Sports, Science and Technology in Japan
- Web sites (<http://card.medic.kumamoto-u.ac.jp/card/english/index.html>).
- CARD is a world hub center for production, phenotyping, cryopreservation, and supply of genetically engineered mice. To promote biological sciences worldwide, CARD produces genetically engineered mice and exchangeable gene trap ES cell clones, cryopreserves mouse embryos and sperm, supplies these resources and organizes training courses to educate people. Kumamoto Mouse Clinic will start its full activity on April, 2013.
- As a founding member of the International Gene Trap Consortium, the Federation of International Mouse Resources (FIMRe), and the Asian Mouse Mutagenesis and Resource Association (AMMRA), CARD is contributing to the promotion of biological sciences in the world. CARD transfers data on mouse strains to the International Mouse Strain Resource (IMSR, <http://www.findmice.org/>) and data on Exchangeable Gene Trap Clone (<http://egtc.jp/>) to the International Gene Trap Consortium (IGTC, <http://www.genetrap.org/index.html>).
- Information on various services can be obtained at the CARD web site (<http://cardb.cc.kumamoto-u.ac.jp/transgenic/index.jsp>).
- Recently, we developed a high efficient cryopreservation method for mouse sperm from any strain including C57BL/6. More than 1,000 pups can be obtained using frozen-thawed sperm from just one C57BL/6 male via *in vitro* fertilization and



embryo transfer techniques.

(<http://card.medic.kumamoto-u.ac.jp/card/english/sigen/manual/spfreeze.html>).

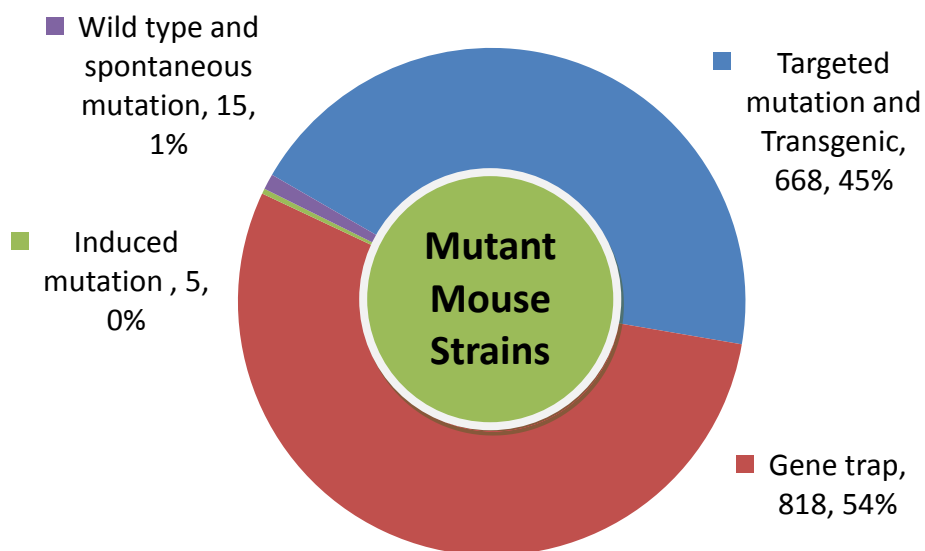






## Part II - Mouse/Rat Strain Resource

Center for Animal Resources and Development CARD, Kumamoto University	
Repository Director	Ken-ichi Yamamura
Email	yamamura@gpo.kumamoto-u.ac.jp
Repository personnel	PI: 1 Staff: 10
Mouse strain resource	Cryopreserved: 1,532
IMSR registered?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Source of resource	<input type="radio"/> Government funding generated <input checked="" type="radio"/> Deposited by researchers





### Part III - Special Announcement

We had training courses on Cryopreservation of Mouse Germplasm in other countries.

- 1) Shanghai Laboratory Animal Center, Chinese Academy of Sciences, Shanghai (2002)
- 2) College of Life Sciences, Peking University, Beijing (2005)
- 3) Bio-Evaluation Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Chungbuk (2008)
- 4) BIOPOLIS, Singapore (2011)
- 5) National Laboratory Animal Center, National Applied Research Laboratories (NLAC NARLabs), Taipei (2012).



We have been establishing online manuals concerning reproductive engineering techniques in mice.

<http://card.medic.kumamoto-u.ac.jp/card/english/sigen/index.html>





Korea Research Institute of Bioscience and Biotechnology, Ochang	
<b>Institute Director/ President</b>	Dr. Hyoung-Chin Kim
<b>AMMRA contact person</b>	Dr. Hyoung-Chin Kim
<b>Phone</b>	+82-43-240-6560
<b>Email</b>	hckim@kribb.re.kr
<b>Address</b>	Biomedical mouse resource center, KRIBB, 30 Yeongudanji-ro, Ochang-eup, Chengwon-gun, Chungcheongbuk-do 363-883, Korea
<b>Website</b>	<a href="http://www.kribb.re.kr/">http://www.kribb.re.kr/</a> (KRIBB) <a href="http://mouse.kribb.re.kr/">http://mouse.kribb.re.kr/</a> (LARC, KRIBB, under reconstruction)



## Laboratory Animal Resource Center, KRIBB, Ochang

### Part I – Institution Briefing

Korea Research Institute of Bioscience and Biotechnology (KRIBB) is a non-profit institute funded by Korean government.

The Korea Research Institute of Bioscience and Biotechnology (KRIBB) is the government-funded non-profit research institute dedicated to state-of-the-art bioscience and biotechnology. The Korean government has been systematically promoting biotechnology through the national plan [Bio-Vision 2016] to make Korea much stronger in bioscience and technology.



KRIBB is also designated by Ministry of Education, Science and Technology (MEST) as a principal institution responsible for archiving resources used for researches and development in the field of bioscience. The Laboratory Animal Resource Center (LARC), KRIBB is one of the centers in KRIBB and is in charge of the archiving mouse resource.

Therefore, one of the main missions of LARC, KRIBB is to archive the mouse resource. Deposited mouse resources are kept as frozen embryos or sperms. Those frozen

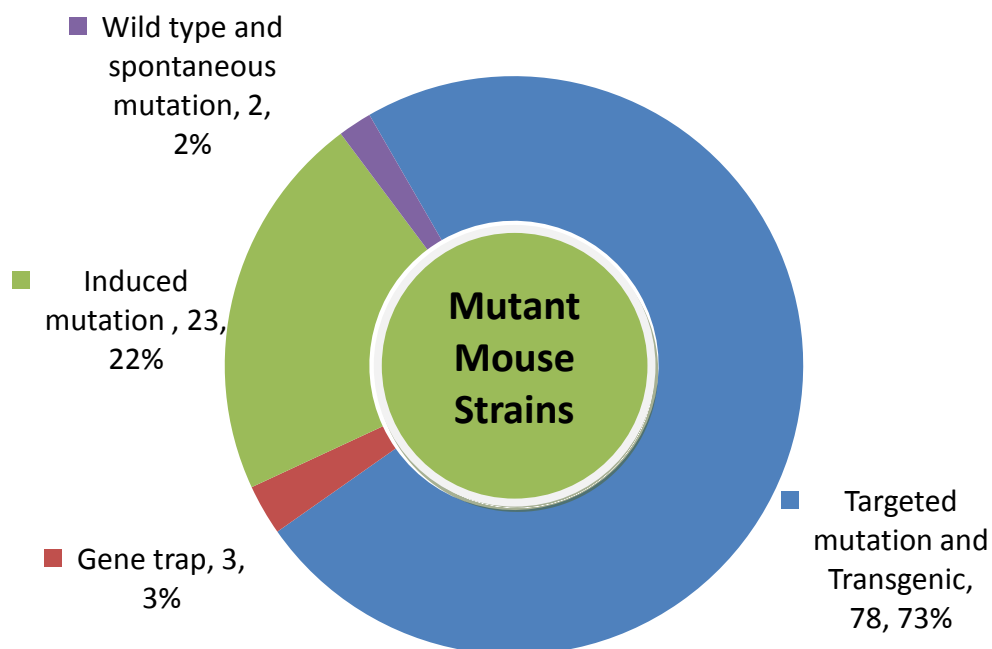
resources are re-vitalized when requested by researchers. One of the most important works serviced by LARC, KRIBB is to diagnose microbiological contamination in mouse and to clean them. LARC, KRIBB have a platform to produce chimeric mouse using ES cell clones, but do not provide a paid service yet. The information on the deposited mouse strains is accumulated into our data base which is opened to public in a limited fashion. LARC, KRIBB also is building a broad-based mouse phenotyping platform right now. LARC, KRIBB will provide these services to scientific society, soon.

LARC, KRIBB is always seeking new ways to provide a better service to research community.



## Part II - Mouse/Rat Strain Resource

MBRC	
Repository Director	Dr. Hyoung-Chin Kim
Email	hckim@kribb.re.kr
Repository personnel	PI: 4 Staff: 23
Mouse strain Resource	Live: 10 Cryopreserved: 96
IMSR registered?	<input type="radio"/> Yes <input checked="" type="radio"/> No
Source of resource	<input checked="" type="radio"/> Government funding generated <input checked="" type="radio"/> Deposited by researchers







### Part III - Special Announcement

Local training

#### Laboratory animal Workshop

- Basic technics for laboratory animals
- Health and genetic monitoring
- Embryo freezing/thawing/transfer

Date: November 20-21, 2012

Place: KRIBB

Organizer: KRIBB



#### CIEA-KRIBB Joint Workshop

- Health monitoring  
& management

Date: March 14-16, 2013

Place: KRIBB

Organizer: KRIBB-CIEA









**National Laboratory Animal Center,  
National Applied Research Laboratories, Taipei**

<b>Institute Director/ President</b>	Dr. Chun-Keung Yu
<b>AMMRA contact person</b>	Dr. Chi-Kuang Leo Wang
<b>Phone</b>	+886-2-27895567
<b>Email</b>	<a href="mailto:cklwang@nlac.narl.org.tw">cklwang@nlac.narl.org.tw</a>
<b>Mailing address</b>	P.O. BOX 1-86 Nangang, Taipei City 11529 Taiwan
<b>Institute address</b>	128 Academia Road, Section 2, Nankang, Taipei 115, Taiwan
<b>Website</b>	<a href="http://www.nlac.org.tw/english/default.asp">http://www.nlac.org.tw/english/default.asp</a>



## National Laboratory Animal Center, National Applied Research Laboratories, Taipei



### Part I – Institution Briefing

The National Laboratory Animal Center (NLAC) is a non-profit institute under the National Applied Research Laboratories (NARLabs); the funding source is supported by the government. The missions of NLAC NARLabs are to supply rodent resources and technical supports for the research communities in Taiwan. NLAC NARLabs operations are accredited by ISO/IEC17025, ISO27001:2005, ISO 9001:2008, and awarded by AAALAC Full Accreditation; NLAC NARLabs services are also enrolled in Performance Evaluation Program for Diagnostic Laboratories (PEP) to assure quality control performance.

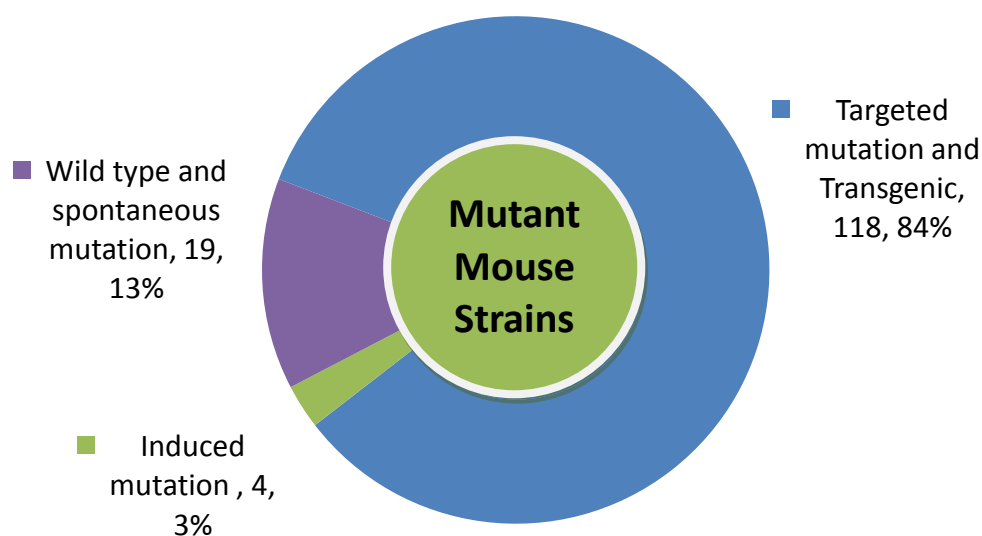
In addition to the rodent supply and diagnostic services, NLAC NARLabs has been devoting deeply in the generation, archiving and sharing of GM mouse and rat models. To advocate the use of important rodent resource in Taiwan, NLAC NARLabs launched a regional repository project in 2009, named Rodent Model Resource Center (RMRC). RMRC-NLAC offers cryopreservation and ART services upon requests to collect and preserve GM models generated by researchers in Taiwan. Furthermore, RMRC-NLAC also generates novel GM models to enrich the repository resource. Since 2010, RMRC-NLAC has been a registered member of International Mouse Strain Resource (IMSR). With the successful development of a unique BAC gene manipulation system, NLAC NARLabs subsequently strengthens the transgenic mice/rat platform as well as the conditional knockout / Cre mice production pipelines.

To better support the research communities, NLAC NARLabs will continuously seek for connection and collaboration with renowned organizations and associations around the world.



## Part II - Mouse/Rat Strain Resource

Rodent Model Resource Center (RMRC)	
Repository Director	Dr. Chi-Kuang Leo Wang
Email	<a href="mailto:cklwang@nlac.narl.org.tw">cklwang@nlac.narl.org.tw</a>
Repository personnel	PI: 6 Staff: 43
Mouse strain Resource	Live: 35 Cryopreserved: 97
Rat strain Resource	Live: 9
IMSR registered?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Source of resource	<input checked="" type="radio"/> Government funding generated <input checked="" type="radio"/> Deposited by researchers





### Part III - Special Announcement

#### Local training

#### **Breeding and analysis Course of the genetic modification Mice**

##### **-GEMMS workshop of TG mice**

Date: February 13-14, 2012

Place: Academia Sinica

Organizer: NLAC NARLabs-GEMMS

Sponsors: TMMC, TMC

#### **Mouse and Rat Blood Sampling, Drug Administration, Euthanasia Practical Training & Introduction to Histology**

- February 17, 2012 @ NLAC NARLabs-Taipei Center
- April 03, 2012 @ NLAC NARLabs-Tainan Facility
- May 25, 2012 @ NLAC NARLabs-Taipei Center
- September 25, 2012 @ NLAC NARLabs-Tainan Facility

#### **Clinical and Pathological Phenotyping Course**

- April 19, 2012 @ Academia Sinica
- June 28, 2012 @ NLAC NARLabs-Tainan Facility

#### **Mouse Colony Management Workshop**

Date: August 27, 2012

Place: Academia Sinica

#### **Bone Marrow Smear Examination**

Date: October 03, 2012

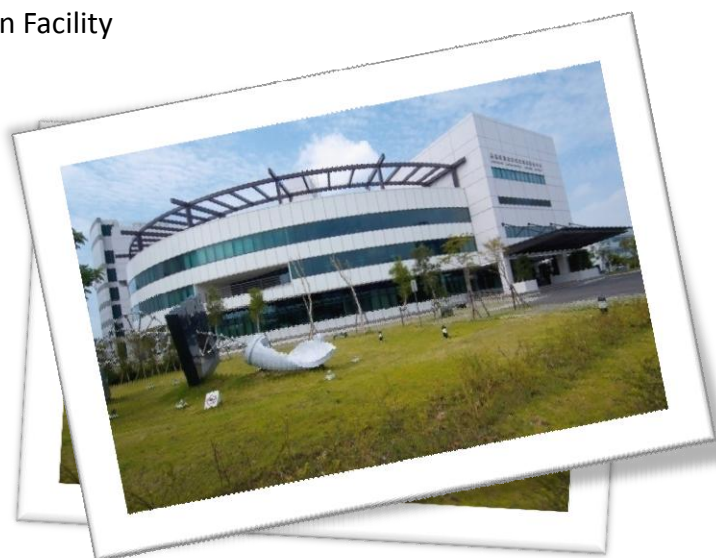
Place: Academia Sinica

#### **Physiological Features and Common Diseases of Rodent and Rabbit**

Date: November 20, 2012

Place: Academia Sinica

#### **Cryopreservation and Reproduction Techniques for Laboratory Mouse**





NLAC NARLabs with Center for Animal Resources & Development (CARD) of Kumamoto University, Japan signed the memorandum of cooperation in 2010, was honored to introduce the course of Dr. Nakagata team this year. The course will provide 2-Days training program to Reproductive engineering techniques and their application in mice.

Date: November 14-15, 2012

Place: NLAC NARLabs-Taipei Center

### **Laboratory Rodent Histology**

Date: December 11, 2012

Place: Academia Sinica

**NLAC NARLabs plans to hold an advanced course related to rodent animal models with speakers from Jackson Laboratory in 2014.**








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**National Resource Center of Mutant Mice (NRCMM), Nanjing**

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Institute Director/ President	Dr. Xiang Gao
AMMRA contact person	Dr. Jing Zhao
Phone	+86 2558641533
Email	<a href="mailto:zhaojing@nicemice.cn">zhaojing@nicemice.cn</a> , <a href="mailto:gaoxiang@nju.edu.cn">gaoxiang@nju.edu.cn</a>
Address	12 Xuefu Road, Pukou District, Nanjing 210061
Website	<a href="http://www.nicemice.cn">www.nicemice.cn</a> <a href="http://www.nbri-nju.com/en-us/">www.nbri-nju.com/en-us/</a>

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## National Center for Mutant Mice of China, Nanjing



### Part I – Institution Briefing

National Resource Center of Mutant Mice (NRCMM) is one of the 8 national laboratory animal resource centers designated by the Ministry of Science and Technology of China. Established in 2005, NRCMM is affiliated with the Model Animal Research Center of Nanjing University (MARC) and Nanjing Biomedical Research Institute of Nanjing University (NBRI).

The mission of NRCMM is to promote the biomedical research in China by providing services related to mouse models. NRCMM services include depository, cryopreservation, and distribution of mutant mice. As one of the major transgenic platforms in China, NRCMM also provide services to generate and phenotype KI/KO and transgenic mouse lines for biomedical research community. In addition, NRCMM also hosts education programs for mouse colony management and mouse genetics studies.

NRCMM has three divisions. The resource department is responsible for the mouse importation, breeding, distribution, cryopreservation, and genetic/microbiological monitoring. The technical service department provides transgenic service and phenotyping service. And the administration office manages the human resource, financial affair, facility maintenance, and education program.

NRCMM joined the International Mouse Phenotyping Consortium in 2011 and is the founding member of Asian Mouse Mutagenesis and Resource Association (AMMRA) and Asian Mouse Phenotyping Consortium (AMPC). NRCMM became a member of International Mouse Strain Resource (IMSR) since 2011. Currently, NRCMM holds total 1400 strains of mice. 508 strains are available for general distribution in 2012. NRCMM has been awarded full accreditation by AAALACI since 2006.



In 2012, NRCMM supplied more than 220 strains of mice to more than 300 customs in China. These customs include 88 universities, 60 research institutes, 97 hospitals, and 30 pharmaceutical companies in 29 provinces. Most of these mice are used as disease models for diabetes, AD, autoimmune diseases. NRCMM also helped the Chinese scientists in 29 research institutes/universities to import total 73 strains of mice from US, UK, France, Australia and Austria.

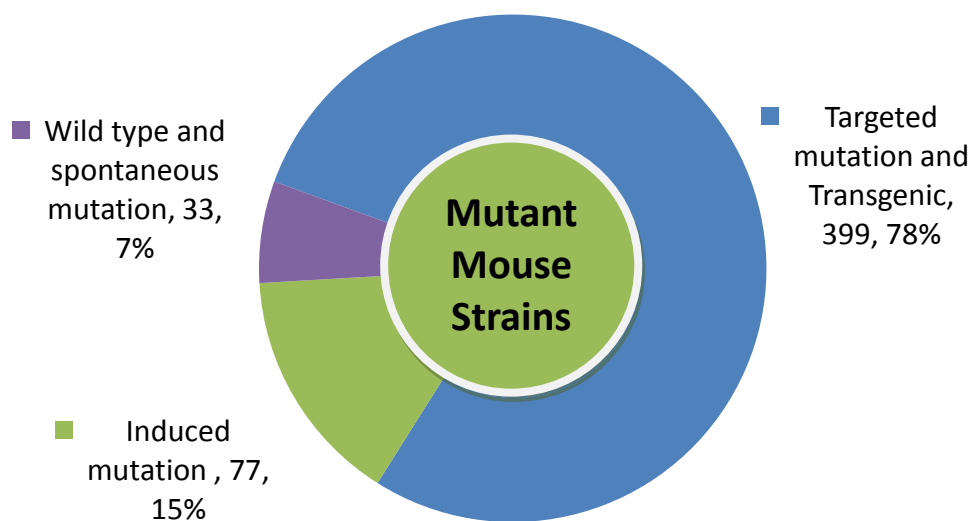
In return, NRCMM is grateful to receive 72 new mutant strains donated by scientists in China in 2012. Additional information can be found at [www.nicemice.cn](http://www.nicemice.cn) and [www.nbri-nju.com/en-us/](http://www.nbri-nju.com/en-us/)





## Part II - Mouse/Rat Strain Resource

National Resource Center of Mutant Mice (NRCMM)	
Repository Director	Dr. Xiang Gao
Email	<a href="mailto:gaoxiang@nju.edu.cn">gaoxiang@nju.edu.cn</a>
Mouse strain Resource	Live: 245 Cryopreserved: 264
IMSR registered?	<ul style="list-style-type: none"> <li>• Yes</li> <li>○ No</li> </ul>
Source of resource	<ul style="list-style-type: none"> <li>• Government funding generated</li> <li>• Deposited by researchers</li> </ul>



### **Part III - Special Announcement**

#### **7<sup>th</sup> AMMRA and 3<sup>rd</sup> AMPC Annual Meeting. Nanjing, China. March 15-17, 2012**

Delegations of AMMRA and IMPC joined the meeting and reported the activity of each centers around Asian. Dr. Xiang Gao became the president of AMMRA and Dr. Yuichi Obata was voted as President-elected for next term.

#### **Onsite visit from AAALACI. Nanjing, China. July 21-23, 2012**

This was the third onsite evaluation by AAALACI. NRCMM became the first institute that fully complying with the new NIH Guide for Laboratory Animal Use and Care in China. A full accreditation was awarded again by AAALACI in December.

#### **4<sup>th</sup> Summer Camp for Model Animal Research. Nanjing, China. July 15-24, 2012**

More than 60 senior college students participated in this summer camp.

#### **Nanjing University MARC/RIKEN BRC International Short Summer Course of the Mouse. Tsukuba, Japan. August 27-29, 2012**

The course provided comprehensive introduction for model technology of mouse genetics and phenotyping. 16 students from 5 countries joined the course.

#### **Model Animal Research Workshop for Celebrating 10 Year Anniversary of MARC. Nanjing, China. November 9-19, 2012**

More than 100 top scientists form US, UK, Japan, and China joined the celebration and workshop.

#### **Selected Publications from NRCMM**

1. Jiang X, Zhou Y, Xian L, Chen WQ, Wu HW, Gao X (2012) The mutation in Chd7 causes misexpression of Bmp4 and developmental defects in telencephalic midline. American Journal of Pathology 181: 626-641.
2. Zhou Y, Jiang X, Gu PY, Chen WQ, Zeng XS, Gao X (2012) Gsdma3 mutation causes bulge stem cell depletion and alopecia mediated by skin inflammation. American Journal of Pathology 180: 763-774.
3. Ducommun S, Wang HY, Sakamoto K, MacKintosh C, Chen S (2012) Thr(649)Ala-AS160 knock-in mutation does not impair contraction/AICAR-induced glucose transport in mouse muscle. American Journal of Physiology-Endocrinology and Metabolism 302: E1036-E1043.
4. Yang H, Shi LY, Wang BA, Liang D, Zhong CQ, Liu W, Nie YZ, Liu J, Zhao J, Gao X, Li



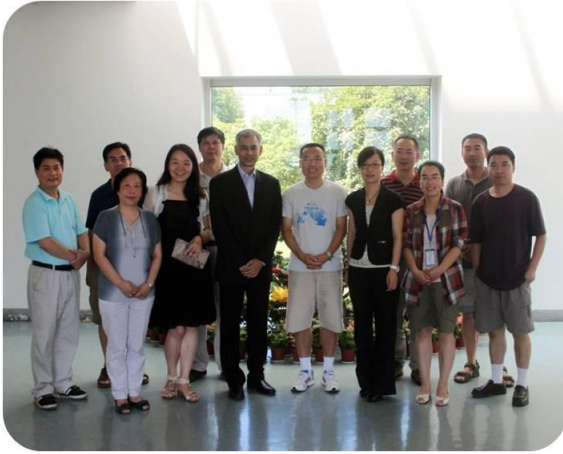
- DS, Xu GL, Li JS (2012) Generation of genetically modified mice by oocyte injection of androgenetic haploid embryonic stem cells. *Cell*, 149:605-17
5. Lin ZY, Perez P, Lei D, Xua J, Gao X, Bao JX (2011) Two-phase analysis of molecular pathways underlying iPS cell induction. *Stem Cells*, 29:1963-74
  6. Wu QF, Yang L, Li S, Wang Q, Yuan XB, Gao X, Bao L, Zhang X (2012) Fibroblast growth factor 13 is a microtubule-stabilizing protein regulating neuronal polarization and migration. *Cell*. 149:1549-64.
  7. Yang WW, Xia Y, Ji HT, Zheng YH, Liang J, Huang WH, Gao X, Aldape K, Lu ZM (2011) Nuclear PKM2 regulates beta-catenin transactivation upon EGFR activation. *Nature*, 478: 118-122
  8. Mao T, Shao M, Qiu Y, Huang J, Zhang Y, Song B, Wang Q, Jiang L, Liu Y, Han JD, Cao P, Li J, Gao X, Rui L, Qi L, Li W, Liu Y (2011) PKA phosphorylation couples hepatic inositol-requiring enzyme 1 $\alpha$  to glucagon signaling in glucose metabolism. *Proc Natl Acad Sci USA*. 108:15852-7
  9. Di RM, Wu XQ, Chang Z, Zhao X, Feng QT, Lu SS, Luan Q, Hemmings BA, Li XL, Yang ZZ (2012) S6K inhibition renders cardiac protection against myocardial infarction through PDK1 phosphorylation of Akt. *Biochemical Journal* 441: 199-207.
  10. Sun T, Zheng W, Peng H, Zhang A, Chen Y, Tan R, Shen P (2012) A small molecule IFB07188 inhibits proliferation of human cancer cells by inducing G2/M cell cycle arrest and apoptosis. *Biomed Pharmacother* 66: 512-518.
  11. Gu X, Xing L, Shi G, Liu Z, Wang X, Qu Z, Wu X, Dong Z, Gao X, Liu G, Yang L, Xu Y (2012) The circadian mutation PER2(S662G) is linked to cell cycle progression and tumorigenesis. *Cell Death and Differentiation* 19: 397-405.
  12. Chu DD, Pan HS, Wan P, Wu J, Luo J, Zhu H, Chen J (2012) AIP1 acts with cofilin to control actin dynamics during epithelial morphogenesis. *Development* 139: 3561-3571.
  13. Shi DQ, Dai J, Ikegawa S, Jiang Q (2012) Genetic study on developmental dysplasia of the hip. *European Journal of Clinical Investigation* 42: 1121-1125.
  14. Wang L, Chen X, Zheng YY, Li F, Lu Z, Chen C, Liu J, Wang Y, Peng YJ, Shen ZL, Gao JM, Zhu MS, Chen HQ (2012) MiR-23a inhibits myogenic differentiation through down regulation of fast myosin heavy chain isoforms. *Experimental Cell Research* 318: 2324-2334.
  15. Yu Y, Lv N, Lu Z, Zheng YY, Zhang WC, Chen C, Peng YJ, He WQ, Meng FQ, Zhu MS, Chen HQ (2012) Deletion of myosin light chain kinase in endothelial cells has a minor effect on the lipopolysaccharide-induced increase in microvascular endothelium permeability in mice. *Febs Journal* 279: 1485-1494.



16. Gu PY, Qi X, Zhou Y, Wang Y, Gao X (2012) Generation of Ppp2Ca and Ppp2Cb conditional null alleles in mouse. *Genesis* 50: 429-436.
17. Yang W, Lu Y, Xu Y, Xu L, Zheng W, Wu Y, Li L, Shen P (2012) Estrogen Represses Hepatocellular Carcinoma (HCC) Growth via Inhibiting Alternative Activation of Tumor-associated Macrophages (TAMs). *J Biol Chem* 287: 40140-40149.
18. Lu Y, Bao XF, Sun TZ, Xu JF, Zheng W, Shen PP (2012) Triptolide attenuate the oxidative stress induced by LPS/D-GalN in mice. *Journal of Cellular Biochemistry* 113: 1022-1033.
19. Xu HW, Wei YN, Zhang Y, Xu YC, Li F, Liu J, Zhang W, Han XD, Tan RX, Shen PP (2012) Oestrogen attenuates tumour progression in hepatocellular carcinoma. *Journal of Pathology* 228: 216-229.
20. Zhang Q, He XY, Chen L, Zhang CX, Gao X, Yang ZZ, Liu G (2012) Synergistic regulation of p53 by Mdm2 and Mdm4 is critical in cardiac endocardial cushion morphogenesis during heart development. *Journal of Pathology* 228: 416-428.
21. Zhang CH, Chen C, Lifshitz LM, Fogarty KE, Zhu MS, ZhuGe RH (2012) Activation of BK channels may not be required for bitter tastant-induced bronchodilation. *Nature Medicine* 18: 648-650.
22. Xu JY, Qi X, Gong JF, Yu MY, Zhang FX, Sha HB, Gao X (2012) Fstl1 Antagonizes BMP Signaling and Regulates Ureter Development. *Plos One* 7: e32554.
23. Zhu GJ, Wang F, Chen C, Xu L, Zhang WC, Fan C, Peng YJ, Chen J, He WQ, Guo SY, Zuo J, Gao X, Zhu MS (2012) Myosin Light-Chain Kinase Is Necessary for Membrane Homeostasis in Cochlear Inner Hair Cells. *Plos One* 7: e34894.
24. Yan J, Xie BX, Capodice JL, Katz AE (2012) Zylflamend inhibits the expression and function of androgen receptor and acts synergistically with bicalutimide to inhibit prostate cancer cell growth. *Prostate* 72: 244-252.









RIKEN BioResource Center (BRC), Tsukuba	
Institute Director/ President	Yuichi Obata
AMMRA contact person	Yuichi Obata
Phone	+81-29-836-9144
Email	yobata@rtc.riken.go.jp
Address	3-1-1 Koyadai, Tsukuba, Ibaraki 305-0074, Japan
Website	<a href="http://www.brc.riken.jp/inf/en/index.shtml">http://www.brc.riken.jp/inf/en/index.shtml</a>





## RIKEN BioResource Center (BRC), Tsukuba



### Part I – Institution Briefing

- RIKEN BioResource Center (BRC) was established in 2001 at Tsukuba, Japan.
- Type and Funding source: Not-for-profit and government-funded institution.
- Experimental Animal Division (<http://www.brc.riken.jp/lab/animal/en/>) has been designated as the core facility for mouse resources by the National Bioresource Project (NBRP, <http://www.nbrp.jp/index.jsp>) of the MEXT, Japan since FY2002.
- A searchable database: <http://www2.brc.riken.jp/lab/animal/search.php>
- A contact address: [animal@brc.riken.jp](mailto:animal@brc.riken.jp)
- Cryopreservation and advanced reproductive technology: Bioresource Engineering Division headed by Dr. Atsuo Ogura.  
<http://www.brc.riken.jp/lab/kougaku/indexE.html>
- A phenotyping platform: Japan Mouse Clinic lead by Dr. Shigeharu Wakana.  
[http://www.brc.riken.jp/lab/jmc/mouse\\_clinic/en/index.html](http://www.brc.riken.jp/lab/jmc/mouse_clinic/en/index.html)
- RIKEN BRC is a founding member of Asian Mouse Mutagenesis & Resource Association (AMMRA, <http://www.ammra.info/>), The Federation of International Mouse Resources (FIMRe, <http://www.fimre.org/>), Asian Mouse Phenotyping Consortium (AMPC, <http://ampc.asia>), and Asian Network of Research Resource Centers (ANRRC, <http://www.anrrc.org/>).

- RIKEN BRC registers its mouse strains in the International Mouse Strain Resource (IMSR, <http://www.findmice.org/>), a one-stop database of FIMRe, and gene-trap ES cells in the International Gene Trap Consortium (IGTC, <http://www.genetrap.org/index.html>).
- Japan Mouse Clinic and Experimental Animal Division have been participating in the International Mouse Phenotyping Consortium (IMPC) since September, 2011. <http://www.mousephenotype.org/>
- RIKEN BRC has been offering training courses on advanced technologies for the use of mouse resources to Asian scientists and technicians



NANJING UNIVERSITY MARC/RIKEN BRC International Short Summer Course of the Mouse was held on August 27-29, 2012 at RIKEN BRC, Tsukuba. Fifteen trainees from 6 countries participated in the course.



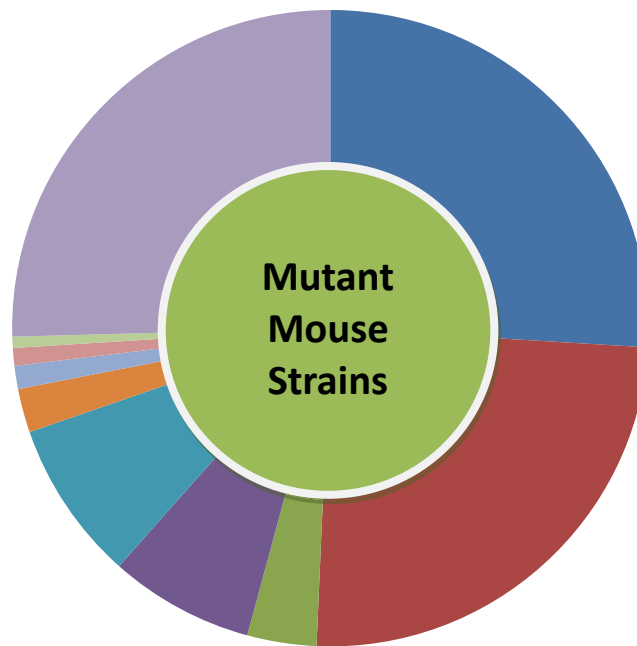
## Part II - Mouse/Rat Strain Resource

RIKEN BRC Experimental Animal Division	
Repository Director	Atsushi Yoshiki, Ph.D., Head
Email	yoshiki@brc.riken.jp
Repository personnel	PI: 1 Senior Research Scientist: 2 Senior Technical Scientist: 2 Research Scientist: 1 Technical Staff: 11 Contract Staff: 53
Website	<a href="http://www.brc.riken.jp/lab/animal/en/">http://www.brc.riken.jp/lab/animal/en/</a>
Mouse strain Resource	Live: 660 Cryopreserved: 4,120 ES/iPS cells <sup>a</sup> : 1,769 BAC clones <sup>b</sup> : C57BL/6N, MSM
Rat strain Resource	BAC clones <sup>b</sup> : F344, LE, ACI
IMSR registered?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Source of resource	<input checked="" type="radio"/> Government funding generated <input checked="" type="radio"/> Deposited by researchers

### Notes:

a: 1,750 gene-trap ES cell clones developed by Dr. Ishida, 12 mouse ES cells, and 7 iPS cells are distributed from RIKEN BRC Cell Engineering Division (Cell Bank) (Dr. Yukio Nakamura, cellqa@brc.riken.jp).

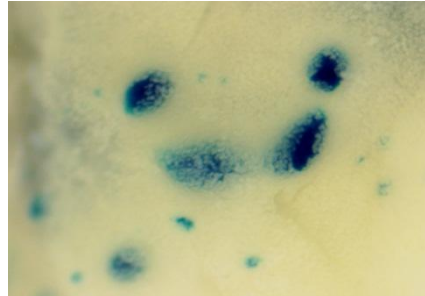
b: Distributed from RIKEN BRC Gene Engineering Division (DNA Bank) (Dr. Yuichi Obata, dnabank@brc.riken.jp).



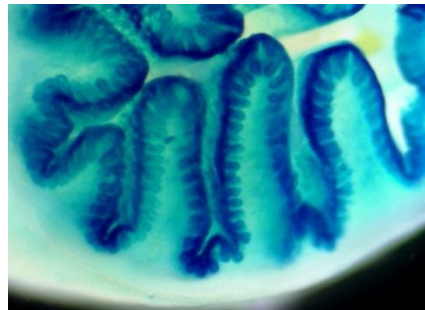
■ Transgenic	1,787, 26%
■ Targeted knockout	1,702, 25%
■ Gene-trap	242, 4%
■ ENU-induced phenotype-driven mutant	506, 7%
■ ENU-induced gene-driven mutant	561, 8%
■ Wild-derived	153, 2%
■ Inbred and spontaneous mutant	81, 1%
■ Recombinant inbred	62, 1%
■ Consomic	39, 1%
■ Gene-trap ES clones (Cell Bank, RIKEN BRC)	1,750, 25%



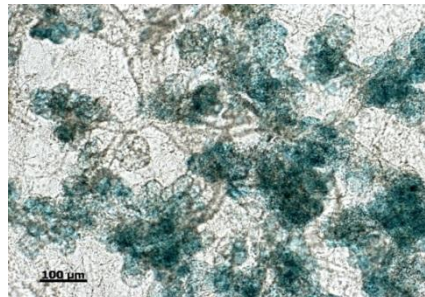
**Ins1** Pancreatic  
beta cells



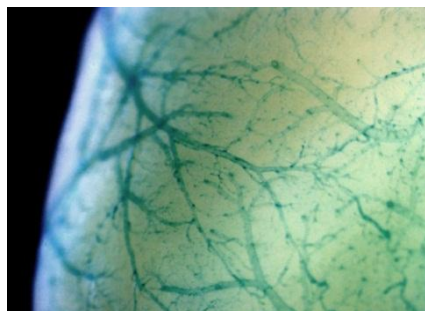
**Vil1** Gut epithelium



**Wap** Mammary  
gland epithelium



**Tek/Tie2**  
Endothelium



Tissue-specific cre mice for conditional experiments



### Part III - Special Announcement

**NANJING UNIVERSITY MARC/RIKEN BRC International Short Summer Course of the Mouse will be held on August 27-29, 2012.**

The First International Short Summer Course of the Mouse by Model Animal Research Center, Nanjing University, China (Director: Dr. Xiang Gao) and RIKEN BioResource Center, Japan (Director: Dr. Yuichi Obata) was co-organized by Drs. Xiang Gao and Yoichi Gondo. The course provided a short educational program using laboratory mouse and navigate participants from basic to cutting-edge technologies. A laboratory tour at RIKEN BioResource Center was also included in the program.

**IMPC International Symposium in Tokyo -International Mouse Phenotyping Consortium: -Its activity and value for biomedical sciences-**

Date: September 28th, 2012 10:00-17:00

Place: WTC Conference Center (Hamamatsu-cho, Tokyo)

Organizer: RIKEN BRC

Sponsors: IMPC, MEXT, JALAS & MBSJ

URL [http://impc.brc.riken.jp/en/sympo\\_1.html](http://impc.brc.riken.jp/en/sympo_1.html)

**The 60th annual meeting of Japanese Association of Laboratory Animal Science (JALAS) will be held on May 15-17, 2013 at Tsukuba International Congress Center by Dr. Yuichi Obata, Director of RIKEN BRC.**

**2013 AMMRA & AMPC business meeting will be held on May 18th at RIKEN BRC.**

**RIKEN BRC/NANJING UNIVERSITY MARC International Summer Intensive Course of the Mouse will be held on July 29-31, 2013 at MARC of Nanjing University.**

**Keynote speakers: Dr. Tom Weaver, Director of MRC Mary Lyon Centre (UK) and Prof. David Wasserman, Director of Mouse Metabolic Phenotyping Center, Vanderbilt University**





## **AMMRA annual meetings**

- 1<sup>st</sup> AMMRA meeting, Shanghai, China, Nov., 22-24, 2006**
- 2<sup>nd</sup> AMMRA meeting, Nanjing, China, Nov., 14-16, 2007**
- 3<sup>rd</sup> AMMRA meeting, Daejeon, Korea, Oct., 23-24, 2008**
- 4<sup>th</sup> AMMRA meeting, Kumamoto, Japan, Dec. 17-18, 2009**
- 5<sup>th</sup> AMMRA pre-meeting, HongKong, Aug., 26-27, 2010**
- 5<sup>th</sup> AMMRA meeting, Taipei, Taiwan, Nov., 8-11, 2010**
- 6<sup>th</sup> AMMRA meeting, Biopolis, Singapore, Nov., 29-Dec., 2, 2011**
- 7<sup>th</sup> AMMRA meeting, Nanjing, China, Mar., 15-17, 2012**
- 8<sup>th</sup> AMMRA meeting, Tsukuba, Japan, May, 18, 2013**







## Contact List

(Accumulative list of attendants from past AMMRA meetings)

ARAKI, Kimi

IRDA, Kumamoto University, Japan

arakimi@gpo.kumamoto-u.ac.jp

ARAKI, Masatake

IRDA, Kumamoto University, Japan

maraki@gpo.kumamoto-u.ac.jp

CHIN, Hsian-Jean

National Laboratory Animal Center

National Applied Research Laboratories, Taiwan

geneichin@nlac.narl.org.tw

CHUNG, Bon-Chu

Institute of Molecular Biology, Academia Sinica, Taiwan

mbchung@sinica.edu.tw

DENG, Hongkui

Department of Cell Biology

The college of Life Sciences, Peking University, China

hongkui\_deng@pku.edu.cn

FEI, Jian

Shanghai Research Center for Biomodel Organism, China

Jfei@sibs.ac.cn

GAN, Ke

Model Animal Research Center, Nanjing University, China

ganke1131105@163.com

GAO, Xiang

Nanjing University; China

gaoxiang@nju.edu.cn

GONDO, Yoichi

RIKEN BioResource Center, Japan



gondo@brc.riken.jp

IKAWA, Masahito

Research Institute for Microbial Diseases, Osaka University, Japan

ikawa@biken.osaka-u.ac.jp

IWAKURA, Yoichiro

Center for Experimental Medicine and Systems Biology

Institute of Medical Science, University of Tokyo, Japan

iwakura@ims.u-tokyo.ac.jp

HICKS, Geoffrey

University of Manitoba; Canada

hicksgg@cc.umanitoba.ca

JIANG, Si-Tse

National Laboratory Animal Center

National Applied Research Laboratories, Taiwan

stjiang@nlac.narl.org.tw

KAKUTA, Shigeru

Center for Experimental Medicine and Systems Biology

Institute of Medical Science, University of Tokyo, Japan

kakuta@ims.u-tokyo.ac.jp

KANEDA, Hideki

RIKEN BioResource Center, Japan

hkaneda@brc.riken.jp

KANG, Hoil

National Institute of Food and Drug Safety Evaluation

Korea Food and Drug Administration, Korea

kanghoil@korea.kr

KATOH, Hideki

Institute for Experimental Animals

Hama-matsu University School of Medicine, Japan

hideki-k@hama-med.ac.jp

KIM, Hyoung-Chin

Korea Research Institute of Bioscience and Biotechnology, Korea

hckim@kribb.re.kr

KOROGI, Rie

Institute of Resource Development and Analysis, Kumamoto University, Japan



korogi@kumamoto-u.ac.jp  
 LEE, Han-Woong  
 Yonsei University (Department of Biochemistry), Korea  
 hwl@yonsei.ac.kr  
 LI, Zheng-hua  
 Institute of Resource Development and Analysis, Kumamoto University, Japan  
 liseika@kumamoto-u.ac.jp  
 LI, Wanbo  
 Disease Resource Experimental Animal Center,  
 Institute of laboratory Animal Science,  
 Peking Union Medical College and Chinese Academy of Medical Sciences,  
 China  
 Li\_Wanbo2006@yahoo.com.cn  
 LIN, Shu-Wha  
 College of Medicine, National Taiwan University,  
 Department of Clinical Laboratory Sciences and Medical Biotechnology, Taiwan  
 mtshuwha@ntu.edu.tw  
 LIN, Chia-Yu  
 National Laboratory Animal Center,  
 National Applied Research Laboratories, Taiwan  
 vetchiayu@nlac.narl.org.tw  
 LIANG, San-Chi  
 National Laboratory Animal Center,  
 National Applied Research Laboratories, Taiwan  
 simon@nlac.narl.org.tw  
 MANICKAM, Arun Kumar  
 Biological Resource Centre, Singapore  
 arunkumar@brc.a-star.edu.sg  
 MASUYA, Hiroshi  
 RIKEN BioResource Center, Japan  
 hmasuya@brc.riken.jp  
 MOORE, Mark W.  
 International Mouse Phenotyping Consortium, USA  
 mwmoore880@comcast.net  
 MORIWAKI, Kazuo



RIKEN BioResource Center, Japan  
moriwaki@brc.riken.jp

MURATA, Takuya  
RIKEN BioResource Center, Japan  
takuyam@brc.riken.jp

NAKAGATA, Naomi  
Kumamoto University, Center for Animal Resources and Development, Japan  
nakagata@kumamoto-u.ac.jp

NAM, Ki-Hoan  
Korea Research Institute of Bioscience and Biotechnology, Korea  
namk@kribb.re.kr

OBATA, Yuichi  
RIKEN BioResource Center, Japan  
yobata@rtc.riken.go.jp

OKABE, Masaru  
Osaka University; Japan  
okabe@gen-info.osaka-u.ac.jp

OH, Goo Taeg  
Ewha Womans University, Laboratory of Cardiovascular Genomics  
Division of Life and Pharmaceutical Sciences, Ewha Womans University, Korea  
gootaeg@ewha.ac.kr

PARK, Jong Hoon  
Sookmyung Women's University, Korea  
parkjh@sookmyung.ac.kr

PONNIAH, Sathivel  
Biological Resource Center, Singapore  
ponniah\_sathivel@brc.a-star.edu.sg

QIN, Chuan  
The Chinese Association for Laboratory Animal Science (CALAS)  
The institute of Laboratory Animal Science, CAMS&PUMC, China  
calas\_ie@126.com

SARUKI, Shigefumi  
RIKEN Tsukuba Planning Section, Japan  
ssaruki@riken.jp

SEONG, Je Kyung



- Seoul National University; Korea  
snumouse@snu.ac.kr
- SERIKAWA, Tadao  
Kyoto University; Japan  
serikawa@anim.med.kyoto-u.ac.jp
- SUZUKI, Tomohiro  
Riken BioResource Center, Japan  
suzukito@brc.riken.jp
- TAKABAYASHI, Shuji  
Institute for Experimental Animals,  
Hamamatsu University School of Medicine, Japan  
Shuji@hama-med.ac.jp
- TAKEDA, Shuko  
The Japanese Association for Laboratory Animal Science (JALAS);  
Osaka University Graduate School of Medicine; Japan;  
takeda@cgt.med.osaka-u.ac.jp
- TERAOKA, Nobuaki  
Beijing Office, Riken, China  
teraoka@riken.org.cn
- WAKANA, Shigeharu  
RIKEN BioResource Center; Japan  
swakana@brc.riken.jp
- WANG, Chi-Kuang Leo  
National Laboratory Animal Center,  
National Applied Research Laboratories, Taiwan  
cklwang@nlac.narl.org.tw
- WANG, Zhu-Gang  
Shanghai Research Center for Model Organisms; China  
zhugangw@shsmu.edu.cn
- WEAVER, Thomas A.  
UK Medical Research Council Harwell; UK  
t.weaver@har.mrc.ac.uk
- WU, Xiaohui  
Fudan University; China  
xiaohui\_wu@fudan.edu.cn



- WURST, Wolfgang  
Helmholtz Zentrum München; Germany  
wurst@helmholtz-muenchen.de
- XIE, Gui-Lin  
Chian Biotech, Labzhou Institute of Biological Product, China  
guilxie@public.lz.gs.cn
- XU, Ping  
Shanghai Laboratory Animal Center, Chinese Academy of Sciences, &  
Shanghai SLAC Laboratory Animal Co., Ltd., China  
xuping@saccas.com
- YANG, Zhi-Wei  
Institute of Laboratory Animal Science  
Chinese Academy of Medical Sciences, China
- YAMADA, Gen  
Department of Developmental Genetics Research  
Wakayama Medical University, Japan  
gensan7@wakayama-med.ac.jp
- YAMAMURA, Ken-ichi  
Center for Animal Resources and Development (CARD),  
Kumamoto University, Japan  
yamamura@gpo.kumamoto-u.ac.j
- YAMAZAKI, Yukiko  
Genetic Informatics Laboratory, Center for Genetic Resource Information,  
National Institute of Genetics, Japan  
yyamazak@lab.nig.ac.jp
- YANG, Xiao  
Genetic Laboratory of Development and Diseases,  
Beijing Institute of Biotechnology, China  
yangx@nic.bmi.ac.cn
- YEN, Jeffrey J.Y.  
Academia Sinica, Taiwan  
bmjyen@ibms.sinica.edu.tw
- YOSHIKI, Atsushi  
RIKEN BioResource Center; Japan  
yoshiki@brc.riken.jp



YU, Dae-Yeul

Korea Research Institute of Bioscience and Biotechnology, Korea  
dyyu10@kribb.re.kr

Lianfeng ZHANG

Institute of Laboratory Animal Science  
Chinese Academy of Medical Sciences  
Peking Union Medical College, China  
zhanglianfeng@cnilas.pumc.edu.cn

ZHAO, Jing

Model Animal Research Center, Nanjing University  
zhaojing@nicemice.cn





## **2012 AMMRA Annual Report**

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**Editing Group/**

Chi-Kuang Leo Wang / Hsian-Jean Genie Chin

Yi-Ling Doreen Lin / Meng-Feng Ryan Lin



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