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BioResource now! Vol.2 No.12 is here

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Cell Technology initiated a new series entitled "Let's Use! BioResource" Bioresources in Japan will be introduced in a series of 14 volumes from November 2006 to December 2007.

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

Other information on bioresources is available at

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

Introduction to Resource Center No.13

National BioResource Project (NBRP) "Pathogenic Microorganisms"

Core Facility: Yuzuru Mikami (Professor, Research Center for Pathogenic Fungi and Microbial Toxicoses, Chiba University)

pathogenic fungi and actinomycetes
 Kazutaka Fukushima (Professor, Research Center for Pathogenic Fungi and Microbial Toxicoses, Chiba University)

pathogenic bacteria

Sub-Facility:
 Takeshi Honda (Professor, Research Institute for Microbial Diseases, Osaka University)
 Chihiro Sasakawa (Professor, The Institute of Medical Science, University of Tokyo)
 Takayuki Ezaki (Professor, Graduate School of Medicine, Gifu University)
 Yoshimi Benno (General Manager, RIKEN BioResource Center)

protozoa

Sub-Facility: Hiroji Kanbara (Professor, Institute of Tropical Medicine, Nagasaki University)

database

Sub-Facility: Hideaki Sugawara (Professor, National Institute of Genetics)

(1) Project Objective



Facilities that participate in the NBRP Pathogenic Microorganisms contribute by developing systems aimed at consolidating the collection, preservation, and distribution of pathogenic bacteria, actinomycetes, fungi, and protozoa. They also develop databases, strengthen inter-facility cooperation through online interaction, and contribute to worldwide research in life science and infectious diseases by promoting the project with the aim of preserving human health and ensuring a secure and healthy society.

With the support of MEXT, NBRP Pathogenic Microorganisms facilities support life science researches in Japan by collecting, preserving and distributing pathogenic microbes.

We are able to help you under the following circumstance

<http://wdcm.nig.ac.jp/byogen/>



<http://www.pf.chiba-u.ac.jp/>

- * If you have trouble identifying any pathogenic protozoa, fungi or microbe.
- * If you wish to deposit any valuable pathogenic protozoa, fungi or microbe which you have discovered or developed. (Your rights will be protected by a MTA)
- * If you wish to request for DNA microbial strains.
- * Please consult with us if you wish to move microbial strains after your retirement.
- * If you have any questions, please contact us.

mikami@faculty.chiba-u.jp

Core Facility: Mikami(Chiba Univ.)
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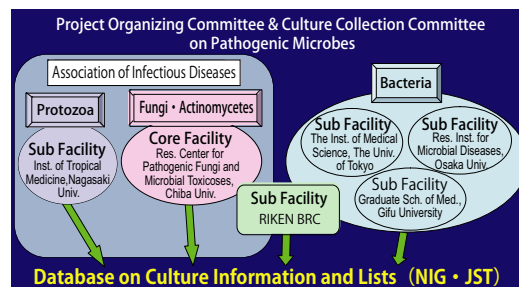
Website of NBRP Pathogenic Microorganisms
<http://wdcm.nig.ac.jp/byogen/>

(2) Characteristics of the Individual Institute Collections

Research Center for Pathogenic Fungi and Microbial Toxicoses, Chiba University

Core facility

This institute houses the largest collection of pathogenic fungi and actinomycetes in Japan and is globally recognized for its top-class standards. Almost 13,000 strains belonging to approximately 350 genera of pathogenic fungi are preserved here. Highly pathogenic exogenous fungi such as *Coccidioides immitis* (type 3 pathogen); imported fungal pathogens such as *Penicillium marneffei*, *Paracoccidioides brasiliensis*, and *Histoplasma capsulatum*; opportunistic and emerging fungal pathogens such as *Candida*; and zoonotic fungal pathogens such as *Trichophyton mentagrophytes* are exhaustively collected and preserved. DNA resources of highly pathogenic fungi are also available. In addition, 1,600 strains belonging to approximately 30 genera, including standard strains of pathogenic actinomycetes, are preserved. The genomic sequences of all *Nocardia* species, including *Nocardia farcinica*, have been elucidated for the first time in the world. Moreover, acid-fast bacteria related to *Rhodococcus* and *Gordonia* are preserved, which makes this collection unique in terms of quality and size.



Control of Infectious Disease
 Counter Measures against Bioterrorism
 Discovery of New Drugs
 Education
 Life Science Studies

Pathogenic Microbes Distribution
 DNA Distribution

NBRP • Pathogenic Microorganisms Organization

Institute of Tropical Medicine, Nagasaki University

Sub-facility

This institute owns a globally unique collection of pathogenic protozoa. The collection, preservation, and distribution of protozoa have been conducted exclusively by ATCC, a US preservation facility. Therefore, it is a valuable project even on a global scale. The distinctive feature of this collection is that all the strains of preserved protozoa in Japan have been included in it with the cooperation of affiliated institutes throughout the country. In addition to enhancing the preservation of conventional American trypanosomes, the institute collects and distributes strains of visceral leishmania from Nepal and *Entamoeba histolytica* and *Blastocystis* from Nepal and Indonesia by isolating the organisms from both humans and monkeys. Researchers benefiting from these resources have written interesting reports, and steady progress has been made in line with the objective of this project.

RIKEN BioResource Center

Sub-facility

This center conducts projects aimed at meeting the needs of the research community and the society from the viewpoint of promoting health and environmental preservation. It focuses mainly on the nonclinical isolates of pathogenic microbes belonging to Biosafety Level (BSL) 2. The center collects and preserves low-pathogenicity microbes that are phylogenetically close to pathogenic microbes and distributes preexisting and newly obtained BSL 2 strains in order to support research on the identification and classification of pathogenic microorganisms. In particular, the center promotes the preservation and distribution of strains belonging to the genera *Bacillus* and *Pseudomonas* whose records are annotated with advanced genetic, physiological, and biochemical information.

Res. Inst. of Medical Sciences, The University of Tokyo

Sub-facility

This institute conducts a service to distribute the following: (i) standard bacteria used as positive controls in research, educational, and inspection service environments; (ii) socially important pathogenic microbes; and (iii) microbes used for training and research purposes in universities. Currently, the institute preserves approximately 1,500 strains—a collection that covers almost all the primary pathogenic bacteria such as *Shigella*; pathogenic *Escherichia coli*, including enteropathogenic *E. coli* (EPEC) and O157; nosocomial infectious bacteria such as opportunistic bacteria and drug-resistant bacteria; intracellular parasitic bacteria such as atypical acid-fast bacteria and obligate intracellular bacteria; zoonotic pathogenic bacteria such as *Brucella* and *Leptospire*; emerging bacterial pathogens such as *Helicobacter pylori* and *Clostridium perfringens*; pathogenic bacteria causing disease outbreaks; and the internationally important Orskov's pathogenic *E. coli*. Furthermore, the center has implemented a service for the collection of bacterial strains whose genomes have been sequenced, which could be used as standards.

Research Institute for Microbial Diseases, Osaka University

Sub-facility

This institute owns an international collection of standard and clinical isolates of primarily pathogenic *E. coli*, *Vibrio*, and other enteropathogenic bacteria (8,515 strains included in the database). Various enteropathogenic bacteria that have been isolated during outbreaks in the country or from overseas travelers are preserved, and abundant information, for example, the properties of each strain and pathogenic agent, is available. The institute is enthusiastically involved in the preservation and distribution of genomically sequenced strains of *E. coli* (EHEC O157:H7), *Vibrio parahaemolyticus* (KX-V 237), and *Streptococcus pyrogenes* (SSI-1) and the inclusion of patented strains and newly reported strains in its collection. In addition, the institute also serves as a reference center.

Graduate School of Medicine, Gifu University

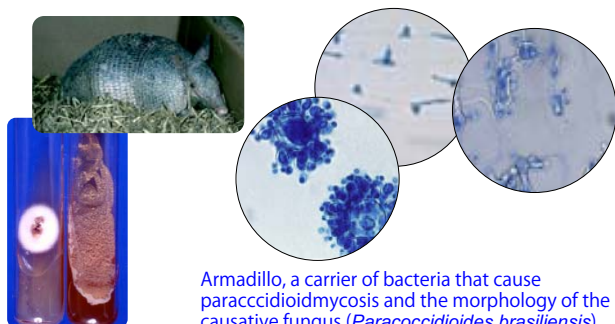
Sub-facility

This institute holds the nation's largest collection of standard pathogenic bacterial strains (more than 20,000); this includes approximately 80% of all bacterial strains that are pathogenic to humans. The collection mainly includes strains of asporogenic anaerobic bacteria and aerobic nonfermentative gram-negative and gram-positive bacteria; aerobic microbes that are pathogenic to humans, animals, and plants; and many standard bacterial strains. The institute preserves 10 of 35 bacterial species (580 strains) belonging to BSL 3, almost all of the roughly 320 species belonging to BSL 2 (approximately 9,000 strains), and nearly 600 species belonging to BSL 1 (9,000 strains).

National Institute of Genetics

Sub-facility

This institute is in charge of developing a database for the Pathogenic Microorganisms project with the objective of preserving and distributing microbial strains. Furthermore, this institute has published detailed data on bacterial toxins and released several animations which educate students and the general public about the O157 strain, *Trichophyton*, and malarial parasite.



Armadillo, a carrier of bacteria that cause paracoccidioidomycosis and the morphology of the causative fungus (*Paracoccidioides brasiliensis*)

(3) Gallery



The gallery contains regularly updated information and images of pathogenic fungi and actinomycetes and is available free of cost for use in research and education.

<http://www.pf.chiba-u.ac.jp/>

(4) Promoting the Project



In order to disseminate information among researchers affiliated to projects on pathogenic microorganisms, two symposiums—the 13th conference of the Japan Society for Culture Collections and the 9th International Symposium of the Research Center for Pathogenic Fungi and Microbial Toxicoses at Chiba University—were organized and well received in the fiscal year 2006.



NBRP poster exhibition was conducted at the 9th International Symposium of the Research Center for Pathogenic Fungi and Microbial Toxicoses at Chiba University

(5) Future Expansion



We will continue our endeavor of augmenting the collection of strains with known genome sequences, exogenous pathogenic microbial strains, and bacterial strains for epidemiological studies; establishment of a genetic library; accumulation of genetic information; development of a diagnostic method for gene identification by culture and nonculture systems; and promotion of public education.



Information Technology

Vol.20

A text mining system for searching journal articles

“Textpresso”

I talked about the CMap system in the August issue. In this issue, I will introduce Textpresso which is also provided by the Generic Model Organism Database (GMOD). Textpresso is a text mining system to search journal articles which was developed by Hans-Michael Muller, Eimear Kenny, and Paul Sternberg, creators of WormBase. Currently, 7,877 full-text articles and 22,180 abstracts are searchable in WormBase.

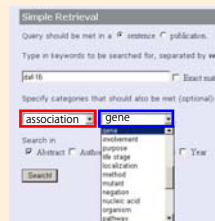
http://www.textpresso.org/index_oldsystem.html (*)

Furthermore, other groups in GMOD have also implemented Textpresso and the Textpresso website has links to sections on Drosophila and yeasts.

Textpresso allows you to search with general keywords just like a Google search. In addition to that, Textpresso also allows you to select ontology phrases from a pull-down menu and search for articles which contain the selected ontology phrase because the journal articles have been preliminarily mined according to categories referred to as “Textpresso Ontology”.

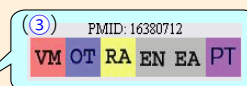
The current Textpresso Ontology includes biological entities (Allele, Cell or Cell Group, Gene, Cellular Component, Phenotype, Molecular Function, etc.) and relationships between the entities (Action, Association, Biological Process, Effect, Pathway, etc.). Among them, Cellular Component, Molecular Function, and Biological Process use data from Gene Ontology (GO) Consortium.

For example, when you want to search for genes related to *daf-16*, type *daf-16* into the textbox as shown in ①, select [association] and [gene] from the pull-down menus and click on search. The list of journal articles retrieved will be displayed as shown in ②.



①

②



③

The Select buttons ③ in image ② links to View Match **VM**, journals **OT**, PubMed **RA** and can be outputted in the Endnote (EN) format. Upon clicking the **VM** link, sentences in the selected articles are displayed with the related keywords displayed in color.

Image ④ shows the result of the search conducted in ①. Sentences with the keyword *daf-16* or “complex” and “binding” which was associated with the term [association], or terms such as *genes*, *sod-3*, *def-2*, which was associated with the term [gene], were retrieved and displayed in each result.

Query: Categories + association + gene - Keywords + daf-16*
 Display page 1 of 2, or previous or next page. ④

File ID WBPpaper00027009 (Paper), Sentences 16 to 20: In mammalian cells, direct target genes several transcription factors have been identified using a combination of ChIP and subsequent cloning. We developed a modified ChIP assay for use in *C. elegans*. We immunoprecipitated the DAF-16 DNA complex using wild-type, *daf-2* (+1370) or *daf-16* (ms86) strains (Fig. 1a). To evaluate the specificity of the assay, we monitored DAF-16 binding to the *sod-3* promoter, a well-known target of FOXO as well as DAF-16 (refs. 4, 9, 10).

OT

File ID WBPpaper00027009 (Paper), Sentences 17 to 21: We developed a modified ChIP assay for use in *C. elegans*. We immunoprecipitated the DAF-16 DNA complex using wild-type, *daf-2* (+1370) or *daf-16* (ms86) strains (Fig. 1a). To evaluate the specificity of the assay, we monitored DAF-16 binding to the *sod-3* promoter, a well-known target of FOXO as well as DAF-16 (refs. 4, 9, 10). We designed primers to amplify the *sod-3* promoter, including the predicted DAF-16 binding site, and measured the amount of *sod-3* DNA immunoprecipitated.

OT

The method of searching by text mining as introduced in this example is considered extremely useful for searching through massive amount of information. We are developing a database for rice (Oryzabase) and are considering Textpresso as one of the methods for article searching.

(Rie Tsuchiya)

(*) The current version of Textpresso available at WormBase is a newer version than the one provided as an open-source.

Editor's Note: The final BioResource Now! newsletter in 2006 was contributed by Prof. Mikami, who is in charge of resources on pathogenic microorganisms. The research on pathogenic microbes is a cornerstone to support peace and security, and Japan is at the forefront in this field. We recommend that our readers visit the web gallery of the Research Center for Pathogenic Fungi and Microbial Toxicoses, Chiba University. In December, the NCBI released dbGaP—a database of diseases. Currently, approximately 3,000 data regarding ophthalmic diseases and Parkinson's disease are recorded in the database, and the published information is extremely useful to not only researchers but also the general public. We hope that the information will also be made available in Japanese. We wish all our readers a happy new year. (Y.Y.)

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