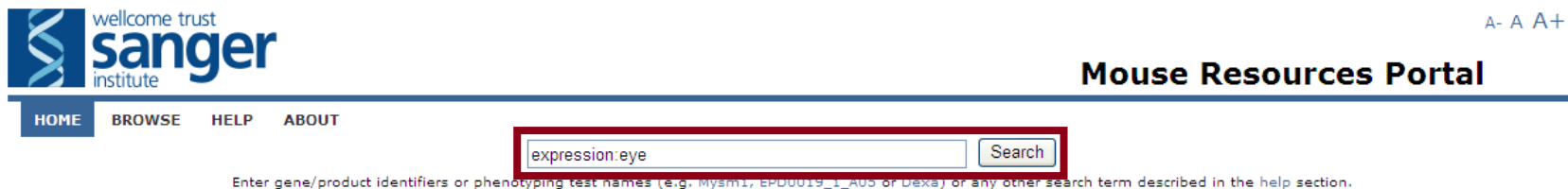


Sanger Mouse Portal “How to” Guide

How to search and view *lacZ* reporter gene expression data

1. From the Sanger Mouse Portal home page (<http://www.sanger.ac.uk/mouseportal/>), enter your tissue or organ of interest prefixed with “expression:” (e.g. expression:eye) into the **Search** field and click search:



About This Portal

The Wellcome Trust Sanger Institute generates, characterises, and uses a variety of reagents for mouse genetics research. It also aims to facilitate the distribution of these resources to the external scientific community. Here, you will find unified access to the different resources available from the Institute or its collaborators. The resources include: 129S7 and C57BL6/J bacterial artificial chromosomes (BACs), MICER gene targeting vectors, knock-out first conditional-ready gene targeting vectors, embryonic stem (ES) cells with gene targeted mutations or with retroviral gene trap insertions, mutant mouse lines, and phenotypic data generated from the Institute’s primary screen.

Phenotyping Summary

The table below displays the **number of alleles** that have completed different stages of the MGP Phenotyping pipeline (funded by WTSI & EUMODIC)

| | |
|--|-----|
| Comprehensive Phenotyping Substantively Complete | 564 |
| Infection Challenge (Salmonella and Citrobacter) | 495 |
| LacZ Expression (Adult and E14.5) | 339 |

Other Data Summary

The table below displays the **number of unique genes** with each individual product type produced at the Wellcome Trust Sanger Institute.

| | | | | | | |
|-----------|-----------------|-------------------|------------------------|-------|---------------|------------|
| Funding: | WTSI EUMODIC | KOMP EUCOMM | KOMP EUCOMM | WT | WT | WT |
| Products: | Mice | Targeted ES Cells | Gene Targeting Vectors | MICER | C57Bl/6J BACs | 129S7 BACs |
| | 904 | 13011 | 15105 | 6719 | 12037 | 11874 |

Phenotyping Overview



Download a heat map of phenotyping results by assay. This spreadsheet also links to the detailed phenotyping data on this portal.

You can also access (and search) the same data via the MGP Phenotyping BioMart.

NEW - Disease predictions based on semantic similarity between OMIM disorder clinical features and model organism phenotypes.



If you would like to be kept updated with information on our phenotyping data, please subscribe to our mailing list.

Sanger Mouse Portal “How to” Guide

2. This returns a list of genes in which *lacZ* reporter gene expression has been detected in the eye of at least one animal.

The screenshot shows the Sanger Mouse Resources Portal search results for the query 'expression:eye'. The page features the Wellcome Trust Sanger Institute logo and navigation links (HOME, BROWSE, HELP, ABOUT). A search bar is visible with the text 'search'. The search results are displayed as a list of genes, each with a set of resource links. The gene 'Appl2' is highlighted with a red box. The resource links for each gene are: Gene Details, WTSI Phenotyping, Mice, IKMC Vectors and ES Cells, and DNA Clone Resources. A 'Previous' and 'Next' navigation bar is also present.

wellcome trust
sanger
institute

A- A A+

Mouse Resources Portal

HOME BROWSE HELP ABOUT

search

Search Results for 'expression:eye'

« Previous 1 2 3 4 5 6 7 8 9 10 Next »

Explain These Search Results

▶ **Adam17** Datasets: Gene Details WTSI Phenotyping Mice IKMC Vectors and ES Cells DNA Clone Resources

▶ **Akap9** Datasets: Gene Details WTSI Phenotyping Mice IKMC Vectors and ES Cells DNA Clone Resources

▶ **Akt2** Datasets: Gene Details WTSI Phenotyping Mice IKMC Vectors and ES Cells DNA Clone Resources

▶ **Amfr** Datasets: Gene Details WTSI Phenotyping Mice IKMC Vectors and ES Cells DNA Clone Resources

▶ **Anxa6** Datasets: Gene Details WTSI Phenotyping Mice IKMC Vectors and ES Cells DNA Clone Resources

▶ **Appl2** Datasets: Gene Details WTSI Phenotyping Mice IKMC Vectors and ES Cells DNA Clone Resources

▶ **Arhgap25** Datasets: Gene Details WTSI Phenotyping Mice IKMC Vectors and ES Cells DNA Clone Resources

Sanger Mouse Portal “How to” Guide

- This list summarises the available data for each gene split into the following datasets that are populated (pink with white writing) when resources are available and grey when no information is available:

Datasets: [Gene Details](#) [WTSI Phenotyping](#) [Mice](#) [IKMC Vectors and ES Cells](#) [DNA Clone Resources](#)

- Gene Details
- WTSI Phenotyping
- Mice
- IKMC Vectors and ES Cells
- DNA Clone Resources

- These data can be reviewed one gene at a time as follows. Click on the first gene of interest e.g. *Appl2*. This rolls down the gene specific information split into the above datasets.

▶ **Amfr** Datasets: [Gene Details](#) [WTSI Phenotyping](#) [Mice](#) [IKMC Vectors and ES Cells](#) [DNA Clone Resources](#)

▶ **Anxa6** Datasets: [Gene Details](#) [WTSI Phenotyping](#) [Mice](#) [IKMC Vectors and ES Cells](#) [DNA Clone Resources](#)

▼ **Appl2** Datasets: [Gene Details](#) [WTSI Phenotyping](#) [Mice](#) [IKMC Vectors and ES Cells](#) [DNA Clone Resources](#)

▶ **Gene Details**

▼ **WTSI Phenotyping**

📄 **MP Ontology Based Heatmap**

- The WTSI Phenotyping panel presents the primary phenotyping data as a colour coded heat map style summary of all phenotyping data for that gene. Data are grouped for presentation in two ways:
 - As a Mammalian Phenotype (MP) Ontology Based Heatmap
 - As a Phenotyping Test Based Heatmap

Sanger Mouse Portal “How to” Guide

- To view the *lacZ* expression analysis data, open the Phenotyping Test Based Heatmap by clicking the bar of the same name. Note this action causes the MP Ontology Based Heatmap to roll up.

▼ **WTSI Phenotyping**

MP Ontology Based Heatmap

Phenotyping Test Based Heatmap

| Allele Name | Colony Prefix | Colony Strain | Viability at weaning | Recessive Lethal Study | Fertility | Embryo <i>lacZ</i> Expression | Adult <i>lacZ</i> Expression | General Observations | Weight Curves | Open Field | Modified SHIRPA | Grip Strength | Hot Plate | Dysmorphology | Rotarod | Non-Invasive Blood Pressure | Prepulse Inhibition | Indirect Calorimetry | Glucose Tolerance (ip) | Auditory Brainstem Response | Body Composition (DEXA) | X-ray Imaging | Stress Induced Hyperthermia | Eye Morphology | Plasma Chemistry | Plasma Immunoglobulins | Haematology (CBC) | Peripheral Blood Lymphocytes | Micronuclei | Tissue Biobank | Heart Weight |
|---------------------------------------|---------------|---------------|----------------------|------------------------|-----------|-------------------------------|------------------------------|----------------------|---------------|------------|-----------------|---------------|-----------|---------------|---------|-----------------------------|---------------------|----------------------|------------------------|-----------------------------|-------------------------|---------------|-----------------------------|----------------|------------------|------------------------|-------------------|------------------------------|-------------|----------------|--------------|
| CenpJ ^{tm1a} (EUCOMM)Wtsi | MBKA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[download a spreadsheet containing all WTSI phenotyping data](#)


Legend - hover over each heading to get a more complete description

- Test complete and data/resources are available
- Test is complete and the data are considered interesting
- Preliminary indication of an interesting phenotype
- Test is complete but the data are not considered interesting
- Test not performed or applicable
- Test pending
- Test abandoned
- Link to a test report page
- Link to a pdf report

- Adult *lacZ* Expression and Embryo *lacZ* Expression (E14.5) data are available when the associated heatmap cells are dark blue indicating that the test is complete and data/resources are available.



Sanger Mouse Portal “How to” Guide

8. Clicking on the graph symbol  in the Adult *lacZ* Expression cell opens the web page on the Sanger Mouse Portal presenting an overview of the standard protocol used and describing the display criteria applied. At the bottom of that page there are three roll down options
- Tick-List
 - Images
 - Background *LacZ* Staining in Adults



A- A A+

Mouse Resources Portal

HOME BROWSE HELP ABOUT

search

Adult *LacZ* Expression Data for *Appl2* (MBPN)

Overview

Adult expression (≥ 6 weeks): The *lacZ* reporter gene within the targeting vector was used to determine the wholemount expression profile of the targeted gene. Mice were fixed by cardiac perfusion using 4% paraformaldehyde (PFA). Following dissection, the tissues to be stained were fixed an additional 30 min in 4% PFA before being rinsed in phosphate buffered saline and transferred to *lacZ* staining solution, containing 0.1% X-gal, for up to 48 hours. After an additional overnight post-staining fixation in 4% PFA, tissues were cleared with 50% glycerol then transferred to 70% glycerol for long-term storage.

Display Criteria

A tick-list of 41 tissues and organs was scored for the presence (green tick) or absence (red cross) of *lacZ* expression.

- The term 'Ambiguous' was assigned when there was uncertainty as to the validity of the observed pattern e.g. staining may be very faint, background or an artefact due to trapping.
- The term 'No Data' was assigned if the stained entity was not available to assess.

By default, up to 27 standard images may be taken using a Leica MZ16A microscope and Imagic software. These images were only collected when X-gal staining was present.

If information or images that you are interested in are not presented, please send details to MGPenquiries@sanger.ac.uk and, on a limited, first come first served basis, we will process your request.

Tick-List

Images

Background *LacZ* Staining in Adult

Sanger Mouse Portal “How to” Guide

9. Open the Tick-List by clicking the bar of the same name. This presents a tabulated view of expression data from individual mice (one column per mouse) processed for that mutant line. Details of each mutant mouse are presented in rows 1-4:
 - i. Colony Name (row 1): Full name of the mouse colony including the ID of the ES cell clone from which it was derived
 - ii. Genotype (row 2): Genotype of the animal that was phenotyped
 - iii. Gender (row 3): Sex of the animal that was phenotyped
 - iv. Age In Weeks (row 4): Age of the animal at the time of analysis
10. The remaining rows summarise the result of the *lacZ* expression analysis for 41 tissues and organs assessed as part of the screen. Possible outcomes are *lacZ* present, absence, ambiguous or no data. Note you may need to scroll down to see all contents of the table.

Adult LacZ Expression Data for Appl2 (MBPN)

Overview

Adult expression (≥ 6 weeks): The lacZ reporter gene within the targeting vector was used to determine the wholemount expression profile of the targeted gene. Mice were fixed by cardiac perfusion using 4% paraformaldehyde (PFA). Following dissection, the tissues to be stained were fixed an additional 30 min in 4% PFA before being rinsed in phosphate buffered saline and transferred to lacZ staining solution, containing 0.1% X-gal, for up to 48 hours. After an additional overnight post-staining fixation in 4% PFA, tissues were cleared with 50% glycerol then transferred to 70% glycerol for long-term storage.

Display Criteria

A tick-list of 41 tissues and organs was scored for the presence (green tick) or absence (red cross) of lacZ expression.

- The term 'Ambiguous' was assigned when there was uncertainty as to the validity of the observed pattern e.g. staining may be very faint, background or an artefact due to trapping.
- The term 'No Data' was assigned if the stained entity was not available to assess.

By default, up to 27 standard images may be taken using a Leica MZ16A microscope and Imagic software. These images were only collected when X-gal staining was present.

If information or images that you are interested in are not presented, please send details to MGPenquiries@sanger.ac.uk and, on a limited, first come first served basis, we will process your request.

Tick-List

| Colony Name | Appl2 Knockout First EPD0101_4_F09 | Appl2 Knockout First EPD0101_4_F09 | Appl2 Knockout First EPD0101_4_F09 |
|----------------------|------------------------------------|------------------------------------|------------------------------------|
| Genotype | Appl2/+ | Appl2/+ | Appl2/+ |
| Gender | Male | Male | Female |
| Age In Weeks | 8.8 | 5.5 | 5.9 |
| Adrenal Gland | ✓ | ✓ | ✓ |
| Bone | ✓ | ✓ | ✓ |
| Brain | ✓ | ✓ | ✓ |
| Brown Adipose Tissue | ✗ | ✗ | ✗ |
| Cartilage | ✓ | ✓ | ✓ |
| Colon | ✗ | ✗ | ✗ |
| Eye | ambiguous | ✓ | ✓ |
| Gall Bladder | ✗ | ✓ | ✓ |
| Heart | ✓ | ✓ | ✓ |
| Kidney | ✓ | ✓ | ✓ |

Sanger Mouse Portal “How to” Guide

11. Open the Images by clicking the bar of the same name. Note this action causes the Tick-List to roll up. Thumbnails of all available images are presented, annotated with the tissue, description, genotype and sex of the animal.

Adult LacZ Expression Data for *Appl2* (MBPN)

Overview

Adult expression (≥ 6 weeks): The lacZ reporter gene within the targeting vector was used to determine the wholemount expression profile of the targeted gene. Mice were fixed by cardiac perfusion using 4% paraformaldehyde (PFA). Following dissection, the tissues to be stained were fixed an additional 30 min in 4% PFA before being rinsed in phosphate buffered saline and transferred to lacZ staining solution, containing 0.1% X-gal, for up to 48 hours. After an additional overnight post-staining fixation in 4% PFA, tissues were cleared with 50% glycerol then transferred to 70% glycerol for long-term storage.

Display Criteria

A tick-list of 41 tissues and organs was scored for the presence (green tick) or absence (red cross) of lacZ expression.

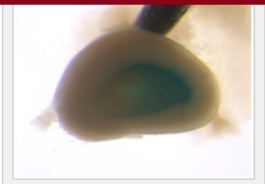


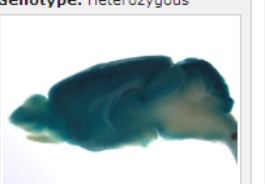
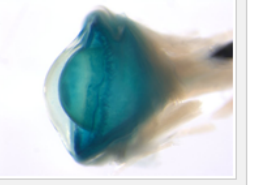
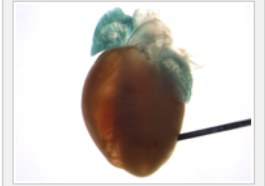
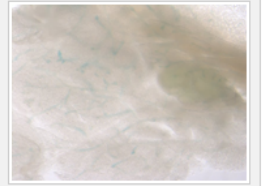
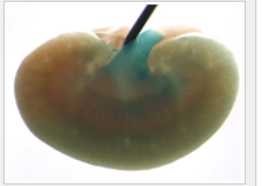
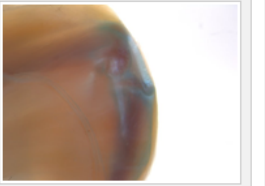

- The term 'Ambiguous' was assigned when there was uncertainty as to the validity of the observed pattern e.g. staining may be very faint, background or an artefact due to trapping.
- The term 'No Data' was assigned if the stained entity was not available to assess.

By default, up to 27 standard images may be taken using a Leica MZ16A microscope and Imagic software. These images were only collected when X-gal staining was present.

If information or images that you are interested in are not presented, please send details to MGPenquiries@sanger.ac.uk and, on a limited, first come first served basis, we will process your request.

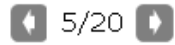
Tick-List

Images

| | | | | |
|--|---|---|---|---|
| Tissue: Adrenal gland Description: - Genotype: Heterozygous | Tissue: Bladder Description: - Genotype: Heterozygous | Tissue: Brain Description: Lateral view Genotype: Heterozygous | Tissue: Brain Description: Longitudinal section Genotype: Heterozygous | Tissue: Eye Description: - Genotype: Heterozygous |
|  |  |  |  |  |
| Tissue: Heart Description: - Genotype: Heterozygous | Tissue: Inguinal fat pad Description: - Genotype: Heterozygous | Tissue: Kidney Description: - Genotype: Heterozygous | Tissue: Knee joint Description: - Genotype: Heterozygous | Tissue: Liver and gall bladder Description: - Genotype: Heterozygous |
|  |  |  |  |  |

Sanger Mouse Portal “How to” Guide

12. To view a larger version of any image, click the associated thumbnail image. This opens a window that allows you to scroll



through all available *lacZ* expression images and provides additional annotation including the age of the mouse and the adult Mouse Anatomy (MA) term used to describe the observed expression pattern.

Overview
Adult expression (2-6 weeks)
4% paraformaldehyde (PFA), 1% glutaraldehyde, 0.1% Triton X-100 in PBS solution, containing 0.1% X-gal for lacZ staining. Fixed in PBS, 4% PFA, 1% glutaraldehyde, 0.1% Triton X-100, 0.1% X-gal storage.

Display Criteria
A tick-list of 41 tissues and organs
• The term 'Ambiguous' was used
• The term 'No Data' was used
By default, up to 27 standard terms are displayed.
If information or images that are not displayed are needed, please contact the Mouse Informatics Group.

Images

| | | |
|------------------------------|-----------------------|-------------------------------|
| Tissue: Adrenal gland | Description: - | Genotype: Heterozygous |
| Tissue: Heart | Description: - | Genotype: Heterozygous |

open image in a new tab/window

| | | | |
|-----------------|--------------|---------------------|----------------|
| Sex | Male | Tissue | Eye |
| Genotype | Heterozygous | Description | - |
| Mouse ID | M00559425 | Age at Death | 5.5w |
| Comments | - | Annotations | MA:0000261 eye |

Sanger Mouse Portal “How to” Guide

13. Open the Background *lacZ* Staining in Adults by clicking the bar of the same name. Note this action causes the Tick-list and Image panels to roll up. This page contains static content summarising the background *lacZ* staining that is routinely observed in wild type adult mice using this wholemount protocol. This information is important when interpreting expression profiles.

Tick-List

Images

Background LacZ Staining in Adult





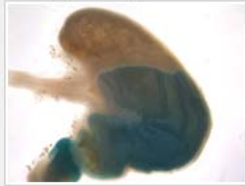
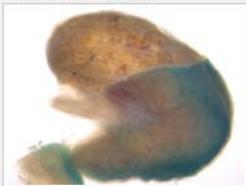



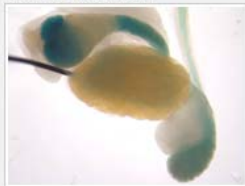
The adult wholemount LacZ expression protocol has been refined to minimize background staining however, it can still occur. We have systematically documented the sites and intensities of this background stain in male and female wildtype C57BL/6 (C57BL/6J-Tyr<c-Brd>; C57BL/6NTac/Den) mice. The major locations where background staining may be observed are:

- Nasal cavity
- Thyroid gland
- Glandular stomach
- Kidney
- Male genitals

Additional background staining is observed occasionally in:

- Rib cage
- Thymus
- Mesenteric lymph nodes
- Ovaries

Examples of the pattern and level of background stain are presented below.

| | | | | |
|--|---|---|--|--|
| <p>Tissue: Nasal cavity Description: Longitudinal section Genotype: Wildtype</p>  | <p>Tissue: Nasal cavity Description: - Genotype: Wildtype</p>  | <p>Tissue: Trachea and thyroid Description: - Genotype: Wildtype</p>  | <p>Tissue: Trachea and thyroid Description: - Genotype: Wildtype</p>  | <p>Tissue: Stomach Description: - Genotype: Wildtype</p>  |
| <p>Tissue: Stomach Description: - Genotype: Wildtype</p>  | <p>Tissue: Kidney Description: Longitudinal section Genotype: Wildtype</p>  | <p>Tissue: Kidney Description: - Genotype: Wildtype</p>  | <p>Tissue: Urogenital system Description: - Genotype: Wildtype</p>  | <p>Tissue: Testis Description: - Genotype: Wildtype</p>  |

Sanger Mouse Portal “How to” Guide

14. Limited Embryo expression (E14.5 wholemount) is available via the Embryo *lacZ* Expression cell on the Phenotyping Test Based Heatmap. Expression is simply recorded as *lacZ* present, absence, ambiguous or no data, with no further granularity. Clicking the Images bar opens all images collected. These can be viewed as described above (steps 11-12).

Embryo LacZ Expression Data for Necab2 (MBHB)

Overview

Embryo expression (E14.5): The *lacZ* reporter gene within the targeting vector was used to determine the wholemount expression profile of the targeted gene. Embryos were collected at E14.5 and drop fixed in 4% paraformaldehyde (PFA) for 30 min. After rinsing in PBS, each embryo was sub-dissected to permit penetration of the stain and transferred to *lacZ* staining solution, containing 0.1% X-gal, for up to 48 hours. After an additional overnight post-staining fixation in 4% PFA, tissues were cleared with 50% glycerol then transferred to 70% glycerol for long-term storage.

Display Criteria

A tick-list indicating if each embryo was scored for the presence (green tick) or absence (red cross) of *lacZ* expression.

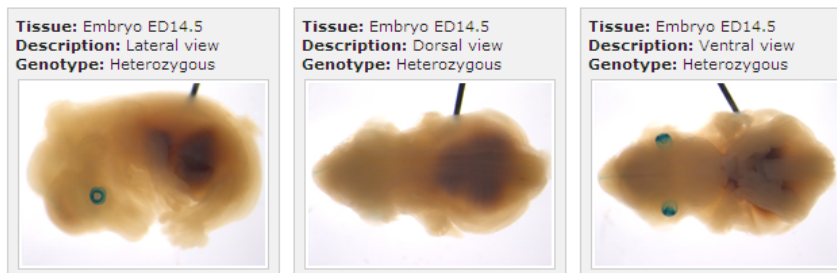
- The term 'Ambiguous' was assigned when there was uncertainty as to the validity of the observed pattern e.g. staining may be very faint or an artefact due to trapping.
- The term 'No Data' was assigned if the stained entity was not available to assess.

By default, 4 standard images (lateral, dorsal and ventral aspects and the placenta) may be taken using a Leica MZ16A microscope and Imagic software. These images were only collected when X-gal staining was present.

If information or images that you are interested in are not presented, please send details to MGPenquiries@sanger.ac.uk and, on a limited, first come first served basis, we will process your request.

Tick-List

Images



Background LacZ Staining in Embryo - No background LacZ staining detected in day 14.5 embryos