

Cre Portal (www.creportal.org) Tutorial

This tutorial contains two parts: first, a step-by-step example that you can use to follow along on your computer; and second, a short set of questions (with answers) for you to test your skills.

Aims

1. Find your way to the Cre Portal and search for a cre transgene or knock-in that uses a particular driver/promoter or is known to have activity in a particular anatomical/tissue system.
2. Explore the contents of the Results Page returned and learn about customizing it for your use.
3. Explore detailed information about the cre activity of a specific cre transgene or knock-in and learn about customizing the view and linking to other data.
 - Cre construct information
 - Availability of mouse resources from repositories
 - Specifics of cre activity/specificity for a transgene in an anatomical location (here reproductive system)
 - Images
 - Publications involving this cre transgene/knock-in
 - Phenotypes observed when mice carrying this cre transgene/knock-in were mated to different gene knock-out heterozygotes
4. Return to the Cre Portal main page and view the data report for ‘all cre transgenes/knock-ins’.

Introduction

Cre is currently the most commonly used recombinase. It catalyzes site-specific recombination of DNA between loxP sites, thus making possible conditional mutagenesis, where specific genes can be knocked-out in particular tissues and at particular developmental time points. Other non-cre recombinases (such as Flp, Dre, phiC31, etc.) and various inducible forms of recombinases have been and are being developed. The Cre Portal contains curated data about all recombinase containing transgenes and knock-ins developed in mice to provide a comprehensive resource delineating known activity patterns and allowing users to find relevant mouse resources for their studies.

At present, researchers can search for “cre” data using the driver/promoter gene symbol or using an anatomical system in which the “cre” is expressed. In addition, data are available for all cre’s in a HTML viewable table, or as downloadable tab-delimited text.

Help with using the Cre Portal is available on the www.creportal.org site. See the list of FAQs in the right-hand column or the ‘Help Documents’ tab in the bottom section of this page. You can also use the ‘Contact Us’ link in the navy blue navigation bar near the top of any of our web pages.

Worked examples:

1. **Find the Cre Portal and search for a cre transgene or knock-in with a particular driver/promoter [or with cre activity in a particular anatomical/tissue system].**

Type the URL: <http://www.creportal.org> into your web browser; OR go to the Mouse Genome Informatics (MGI) homepage (<http://www.informatics.jax.org>) and select the Recombinase (cre) icon. The following illustrates the latter route: visiting the MGI homepage and selecting the icon.

STEP 1:
Navigate to MGI
<http://www.informatics.jax.org>

STEP 2:
Select the Recombinase (cre) icon.

STEP 3:
Type in 'Pbsn' (probasin) driver/promotor and select it from the list that appears.

STEP 4:
Select the 'Search' button.

2. Explore the contents of the Results Page returned from your search and learn about customizing it for your use.

This is the default Results Page from the search illustrated on the previous page. Now let's explore the features of this page.

Recombinase Alleles - Tissue Summary									
You searched for: Driver equals Pbsn <small>Click column headings to sort table data.</small>									
Driver	Matrix View	Allele Symbol Gene; Allele Name	Recombinase Activity Detected	Recombinase Activity Not Detected	Induced By	Find Mice (IMSR)	Refs	Allele Synonym	
Pbsn		Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman	renal & urinary system, reproductive system	alimentary system, cardiovascular system, embryo-other, head, hemolymphoid system, integumental system, liver & biliary system, nervous system, respiratory system		2	247	ARR2PB-Cre, PB-Cre4, PB-Cre, PbCre4	
Pbsn		Hprt^{tm1(creERT2)WPRE} hypoxanthine guanine phosphoribosyl transferase; targeted mutation 1, Frank R Jirik			tamoxifen		2	ARR2PB-CreER(T2)	
Pbsn		Pbsn^{em1(creERT2)Smoc} probasin; endonuclease-mediated mutation 1, Shanghai Model Organisms Center			tamoxifen		1	Pbsn^{em1(V5-2A-CreERT2-WPRE-polyA)Smoc}	
Pbsn		Pbsn^{em1(icre)Gpt} probasin; endonuclease-mediated mutation 1, GemPharmatech Co., Ltd					1	Pbsn-iCre	
Pbsn		Tg(ARR2/Pbsn-icre)58Atiba transgene insertion 58, Atsu Aliba	renal & urinary system, reproductive system	cardiovascular system, liver & biliary system, respiratory system			1	PB-iCre58	
Pbsn		Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman	renal & urinary system, reproductive system	alimentary system, cardiovascular system, embryo-other, head, hemolymphoid system, integumental system, liver & biliary system, nervous system, respiratory system		2	247	ARR2PB-Cre, PB-Cre4, PB-Cre, PbCre4	
Pbsn		Tg(Pbsn-cre)20Fwan transgene insertion 20, Fen Wang	renal & urinary system, reproductive system	mouse-other		1	27	ARR2PB-Cre, ARR2PBi-Cre, PRR2Bi-Cre, Tg(Pbsn-Cre)	
Pbsn		Tg(Pbsn-cre)8113ANg transgene insertion 8113A, Norman M Greenberg					6	PB-Cre [8113-A], PB-Cre	
Pbsn		Tg(Pbsn-cre/Esr1*)14Abch transgene insertion 14, Andreas Birbach			tamoxifen	2	2	ProbasinBAC-MerCreMer	

The columns of the table can be sorted (as indicated by the up/down arrows in the column headers) and reordered (by placing the cursor in any column header). For example, perhaps you want an alphabetic sort of the Drivers in your Results Page; or to sort by the number of references (an indicator of how widely this cre line is used); or to sort by the Find Mice column to bring all those cre lines that are in public repositories to the top of your Results Page.

Driver	Matrix View	Allele Symbol Gene; Allele Name	Recombinase Activity Detected
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Each line of the table provides basic information about the cre transgene or knock-in. Within a row of data, each of which represents a single cre line transgene or knock-in, there are a number of links and actions possible that lead to further data details (shown below).

The link in the **Allele Symbol** column directs you to a page showing phenotypes reported in offspring of mice bearing this cre transgene and mice carrying floxed alleles of various genes (see page 11 of this tutorial).

If there are recombinase activity data for any allele using a driver that is a mouse gene, a grid icon will appear in the **Matrix View** column for all alleles that use that mouse driver gene. The icon links to a matrix which allows you to compare endogenous wild-type gene expression with reported recombinase activity data.

The **Recombinase Activity Detected** and **Not Detected** columns show the anatomical systems where cre activity has been “Detected in...” or “Not detected in...” In turn, each anatomical system term is a link directing you to a page showing the data for cre activity in that system (next page of this tutorial).

The number displayed in the **Find Mice (IMSR) column** is a link to the International Mouse Strain Resource (IMSR) page with information on what repository holds relevant cre lines and how to obtain them.

The number in the **Refs column** shows the number of publications about this cre and links to the full list of these publications (this number gives an idea of how widely this particular cre transgene has been used experimentally).

Driver	Matrix View	Allele Symbol Gene; Allele Name	Recombinase Activity Detected	Recombinase Activity Not Detected	Induced By	Find Mice (IMSR)	Refs	Allele Synonym
Pbsn		Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman	renal & urinary system, reproductive system	alimentary system, cardiovascular system, embryo-other, head, hemolymphoid system, integumental system, liver & biliary system, nervous system, respiratory system		2	247	ARR2PB-Cre, PB-Cre4, PB-Cre, PbCre4

Step 3. Click on the allele symbol for **Tg(Pbsn-cre)4Prb** to go to the allele detail page to find cre activity/specificity in the reproductive system for this cre transgene.

3. Explore detailed information about the cre activity of a specific cre transgene or knock-in and learn about customizing the view.

On the Tg(Pbsn-cre)4Prb Transgene Detail page (shown on page 9), in the Recombinase activity section, click on one of the colored cells for reproductive system. In the pop-up that launches, click on View All Result Details and Images.

Below is the cre specificity detail page for **Tg(Pbsn-cre)4Prb in the Reproductive System**. Many rows of the **Recombinase Activity** table have been omitted to save space in this tutorial document. We will explore each sections of this page (delineated by the blue title column at left).

Tg(Pbsn-cre)4Prb - Reproductive System

Recombinase Activity Detail

Allele Information | Tissue Information | Images | Recombinase Activity | References

Allele Information	Allele: Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman	Driver: Pbsn Type: Transgenic (Cre/Flp)	A						
	Synonym: PB-Cre4, PB-Cre, PbCre4, ARR2PB-Cre								
	Molecular description: The transgene is composed of the cre recombinase gene under the control of a composite promoter derived from rat Pbsn. The rat Pbsn promoter drives postnatal expression in the prostatic epithelium. The transgene is expressed postnatally in prostatic epithelium with the highest level of expression in the lateral lobe of the very low level of transgene expression was detected in the seminal vesicles, testes, and ovaries. No transgene expression was detected in any of the other tissue								
	Find mice (IMSR): Mouse Strains: 1 lines available Cell Lines: 0 lines available								
Tissue Information	Reproductive System	Other recombinase alleles with activity in Reproductive System tissues: ▶ Alpl^{tm1(cre)Nagy} , Amhr2^{tm3(cre)Bhr} , Calb2^{tm1(cre)Zjh} , Ccktm1.1(cre)Zjh ... (more)	B						
	Images	Drag Images to compare to others or to data in the table below. Drag corners to resize images for more detail. Reset Images							
Recombinase Activity	Click heading to re-sort table. i		< prev 1 next > 50	Showing items 1 - 32 of 32	Assays	Genotypic Background	Result Notes		
	Structure	Assayed Age	Level	Pattern	Reference, Source	Assay Type	Reporter Gene	Detection Method	Assay Note
	ductus deferens	postnatal week 8	Ambiguous	Not Specified	J:68167 Fig. 2A 	Recombinase reporter	lacZ	direct	
	ductus deferens	postnatal week 2	Ambiguous	Not Specified	J:68167 Fig. 5D 	Recombinase reporter	lacZ	direct	
epididymis	postnatal week	Absent	Not	J:68167	Recombinase reporter	lacZ	direct		
References	All for this allele: 76 reference(s)								

A. Allele Information. This section contains essentials about the cre transgene itself; its correct nomenclature (symbol and name), the driver involved, other synonyms that have been used in publications, a molecular description of the what the transgene is carrying (in this case, the cre recombinase gene under the control of a composite promoter derived from the rat *Pbsn* gene) and a 'Find mice' IMSR summary indicating whether mice or cell lines carrying this transgene are available from public repositories.

B. Tissue Information. This section lists all other cre transgenes and knock-ins that have reported activity in the Reproductive System. Each symbol is a link to the cre specificity page for that transgene or knock-in for the Reproductive System. The ...[\(more\)](#) indicates there are others and clicking on [\(more\)](#) will bring back the entire list.

Tg(Pbsn-cre)4Prb - Reproductive System

Recombinase Activity Detail

Allele Information | Tissue Information | Images | Recombinase Activity | References

Allele Information	Allele: Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman	Driver: Pbsn Type: Transgenic (Cre/Flp)						
	Synonym: PB-Cre4, PB-Cre, PbCre4, ARR2PB-Cre	The transgene is composed of the cre recombinase gene under the control of a composite promoter derived from rat Pbsn. The rat Pbsn promoter drives postnatal expression in the prostatic epithelium. The transgene is expressed postnatally in prostatic epithelium with the highest level of expression in the lateral lobe of the very low level of transgene expression was detected in the seminal vesicles, testes, and ovaries. No transgene expression was detected in any of the other tissue						
Molecular description:								
Find mice (IMSR):	Mouse Strains: 1 lines available	Cell Lines: 0 lines available						
Tissue Information	Reproductive System	Other recombinase alleles with activity in Reproductive System tissues: ▶ Alpltm1(cre)Nagy , Amhr2tm3(cre)Bhr , Calb2tm1(cre)Zjh , Ccktm1.1(cre)Zjh ... (more)						
Images	Drag Images to compare to others or to data in the table below. Drag corners to resize images for more detail. Reset Images							
	J:68167 Fig. 2	J:68167 Fig. 3	J:68167 Fig. 4	J:68167 Fig. 5				
Recombinase Activity	Click heading to re-sort table. i		< prev 1 next >	50				
			Showing items 1 - 32 of 32		Assays	Genotypic Background	Result Notes	
Structure	Assayed Age	Level	Pattern	Reference, Source	Assay Type	Reporter Gene	Detection Method	Assay Note
ductus deferens	postnatal week 8	Ambiguous	Not Specified	J:68167 Fig. 2A 	Recombinase reporter	lacZ	direct	
ductus deferens	postnatal week 2	Ambiguous	Not Specified	J:68167 Fig. 5D 	Recombinase reporter	lacZ	direct	
epididymis	postnatal week	Absent	Not	J:68167 	Recombinase reporter	lacZ	direct	
	//							
	testis	postnatal week 8	Present	Spotted 		Recombinase reporter	lacZ	direct
	testis	postnatal week 8	Present	Not Specified 	J:68167 No figure available	Recombinase reporter	lacZ	direct
	uterus	postnatal week 8	Absent	Not Applicable 	J:68167 No figure available	Recombinase reporter	lacZ	direct

References All for this allele: 76 reference(s)

C. Images. This section presents a gallery of thumbnail images for cre activity for the tissue being viewed. Images can be enlarged by dragging at the corners and may be moved around the window for convenient viewing. Enlarging an image also activates a pop-up with caption and attribution information.

D. Recombinase Activity. This tabular section provides the annotation detail for the cre activity, including anatomical structure, age, activity level & pattern, and data source. The last columns of the table (separated by a gray bar) are controlled by tabs at the top of the table and allow this section of the table to show variably 'Assay' or 'Genotypic Background' information or 'Result Notes'. The view shown here is 'Assay' information, consisting of Assay Type, Reporter Gene, Detection Method, and Assay Notes. Observe that all columns in this table are sortable, as indicated by the up/down arrowheads after the column heading title. For example, one might want to sort by age to group all data together for a certain age; or by structure; or by level to place all the 'present' vs. 'absent' together. Finally, clicking on the small image in the table highlights the corresponding image in the image gallery so it is easier to identify the image you may want to enlarge.

E. References. This section lists the number of publications for this cre transgene and links to the full list.

Now we will look at some of the links and actions on this page....

Tg(Pbsn-cre)4Prb - Reproductive System
Recombinase Activity Detail

Allele Information | Tissue Information | Images | Recombinase Activity | References

Allele Information	Allele: Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman	Driver: Pbsn Type: Transgenic (Cre)	Synonym: PB-Cre4, PB-Cre, PbCre4, ARR2PB-Cre	Molecular description: The transgene is composed of the cre recombinase gene under the control of the prostate specific antigen promoter. The transgene is expressed predominantly in the prostatic epithelium. The transgene was expressed at a very low level of transgene expression was detected in the seminal vesicle.	Find mice (IMSR): Mouse Strains: 1 lines available Cell Lines: 0 lines available																																				
Tissue Information	Reproductive System	Other recombinase alleles with activity in Reproductive System classes: ▶ Alpi^{tm1(cre)Nagy} , Amhr2^{tm3(cre)Bhr} , Calb2^{tm1(cre)Zjh} , Ccktm1.1(cre)Zjh ... (more)																																							
Images	Drag Images to compare to others or to data in the table below. Drag corners to resize images for more detail. Rescale Images																																								
	J:68167 Fig. 2	J:68167 Fig. 3	J:68167 Fig. 4	J:68167 Fig. 5																																					
Recombinase Activity	Click heading to re-sort table. i < prev 1 next > 50 Showing items 1 - 32 of 32 <table border="1"> <thead> <tr> <th>Structure</th> <th>Assayed Age</th> <th>Level</th> <th>Pattern</th> <th>Reference, Source</th> <th>Assay Type</th> <th>Reporter Gene</th> <th>Detection Method</th> <th>Assay Note</th> </tr> </thead> <tbody> <tr> <td>ductus deferens</td> <td>postnatal week 8</td> <td>Ambiguous</td> <td>Not Specified</td> <td>J:68167 Fig. 2A</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ductus deferens</td> <td>postnatal week 2</td> <td>Ambiguous</td> <td>Not Specified</td> <td>J:68167 Fig. 5D</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>enididymis</td> <td>postnatal week</td> <td>Absent</td> <td>Not Specified</td> <td>J:68167</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Structure	Assayed Age	Level	Pattern	Reference, Source	Assay Type	Reporter Gene	Detection Method	Assay Note	ductus deferens	postnatal week 8	Ambiguous	Not Specified	J:68167 Fig. 2A					ductus deferens	postnatal week 2	Ambiguous	Not Specified	J:68167 Fig. 5D					enididymis	postnatal week	Absent	Not Specified	J:68167				
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enididymis	postnatal week	Absent	Not Specified	J:68167																																					

Step 1. Click on the '1 line available' in the Find Mice (IMSR) section of the Allele Information. This brings you to the **IMSR Summary page** (below).

Step 2. Click on the 'more' in the Tissue Information section to see all of the other cre transgenes and knock-ins known to express in the Reproductive System. Clicking on any of the symbols will bring you to their **comparable Recombinase Activity Detail page**.

Step 3. Enlarge an image by dragging at its corners and move to a convenient viewing place on the page. (see screenshot on page 8).

Below, Result of Step 1. View of IMSR (International Mouse Strain Resource) results and access to a Tg(Pbsn-cre)4Prb bearing strain.

International Mouse Strain Resource (IMSR)

Search Repositories Participate Glossary Contact Us About Us

Export: [CSV] [XLS]		Filter by: State Type Provider Mutation					
N	Strain Name	Synonyms	States	Repository	Mutation Types	Alleles	Genes
-	B6.Cg-Tg(Pbsn-cre)4Prb?	B6.D2-Tg(Pbsn-cre)4Prb,B6.D2-Tg(Pbsn-cre)4Prb,PB-Cre4,B6.Cg-Tg(Pbsn-cre)4Prb	live	NCIMR Order	recombinase(cre/flp)	Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman	Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman

Links to repository's strain information page

Repository abbreviation and email link for questions or to order mice. (NCIMR is the NCI Mutant Resource)

Link to MGI allele/phenotype page for this transgene (later in this tutorial, page 9)

Below, Result of Step 2. List of all other cre transgenes and knock-ins that show activity in the Reproductive System (there are 100 listed here). Each symbol is a link to the respective Reproductive System cre details for that transgene or knock-in. Note the (less) at the end of the list, which will collapse the list back to its original few.

Tissue Information	Other recombinase alleles with activity in Reproductive System tissues: Alp^{tm1}(cre)Nagy , Amhr2^{tm3}(cre)Bhr , Calb2^{tm1}(cre)Zjh , Cck^{tm1.1}(cre)Zjh , Chat^{tm1}(cre)Lowi , Cort^{tm1}(cre)Zjh , Crh^{tm1}(cre)Zjh , Ctsk^{tm1}(cre)Ska , Dlx5^{tm1}(cre)ERT2 , En1^{tm2}(cre)Wnt1 , Gad2^{tm2}(cre)Diph , Gt(ROSA)26Sor^{tm1(FLP)}Ty , Gt(ROSA)26Sor^{tm1(FLP)}Dym , Hnf4^{tm1}(cre)Sav , Hprt^{tm1}(cre)Mmn , Hsd11b2^{tm1}(cre)Ant , Krt19^{tm1}(cre)Mmn , Lyz2^{tm1}(cre)Nagy , Mapt^{tm1}(cre)Nagy , Mnx1^{tm4}(cre)Myf5 , Omp^{tm4}(cre)Mom , Osr1^{tm1}(EGFP/cre)ERT2 , Pax3^{tm1}(cre)Job , Pleckhanov^{tm1}(AMH-cre)1Flor , Pvalb^{tm1}(cre)Arb , Runx1^{tm1}(cre)Esr1 , Runx1^{tm2.1}(cre)Zjh , Shh^{tm1}(cre)Cfr , Six1^{tm1}(cre)ALP , XII^{tm1}(cre)Hei , Sox17^{tm1}(cre)Hei , Sost^{tm2.1}(cre)Esr1 , Tg(Abp1a-cre)1Cma1 , Tg(Acta2-cre)ERT2 , Tg(Acta2-cre)12Pcn , Tg(ActB-cre)1Pcn , Tg(ACFLPe)9205Dym , Tg(Adipoq-cre)1Evd , Tg(Alb1-cre)1Dlr , Tg(Amhc-cre)8815Reb , Tg(cre)1Dek , Tg(ATP6V1B1-cre)45Rnel , Tg(CAG-cre/Esr1*)1Lebe , Tg(Camk2a-cre)T29-1St , Tg(CD2-cre)4Klo , Tg(Cdh16-cre)911gr , Tg(Cdh5-cre)7Mlia , Tg(Cre/ERT2)CIVE23Mlia , Tg(Cga-cre)3Sac , Tg(Chtst4-cre)1Hkwa , Tg(Cyp11a1-cre)16Mchu , Tg(Cyp17a1-cre)ACmkl , Tg(CYP19A1-cre)Jnr , Tg(Cyp19a1-cre)5909Gle , Tg(Cyp19a1-cre)5912Gle , Tg(Ddx4-cre)1Dcas , Tg(Ddx4-cre)ERT2 , Tg(Dhha-cre)1Mejr , Tg(dlx6a-cre)1Mekkk , Tg(DMRT1-cre)1Svs , Tg(E1-cre)JC5379Lmgd , Tg(Eno2-cre)2Lfp , Tg(Fabp4-cre)1Rev , Tg(FOXJ1-cre)F26Htzm , Tg(Fshr-cre)1Ldu , Tg(Gata1-cre)1Sho , Tg(Gcm1-cre)1Chm , Tg(Gdf9-cre)5092Ccoo , Tg(GFAP-cre)25Mes , Tg(GFAP-cre/Esr1*,lacZ)ASbkl , Tg(GFAP-cre/Esr1*,lacZ)B5bkl , Tg(Gh1-cre)1Sas , Tg(Gh1-cre)bKnnm , Tg(Grik4-cre)G3.4Stl , Tg(Hoxd7-cre)13Amc , Tg(Hspa2-cre)1Eddy , Tg(Inha-cre)1Zuk , Tg(Inha-cre)2Zuk , Tg(Ins2-cre)25Mgn , Tg(Itgax-cre)1-1Reiz , Tg(Kcre)29066/2Sip , Tg(Kera-cre)KC4.3Wwk , Tg(Kit-cre)143Hmb , Tg(KLK3-cre)13Saa , Tg(KRT14-cre)1Amc , Tg(KRT14-cre)1Cgn , Tg(KRT14-cre)ERT2 , Tg(KRT15-cre)5.132Jj , Tg(KRT18-cre)ERT2 , Tg(Krtr8-cre/ERT)Cmch , Tg(KRT5-cre/ERT)SCmch , Tg(Krt8-cre)ERT2 , Tg(Lck-cre)548Jxm , Tg(Lht-cre)1Sac , Tg(Mbp-cre)6Gvn , Tg(Mbp-cre)45Rnel , Tg(MMTV-cre)1Mam , Tg(MMTV-cre)4Mam , Tg(Msv-cre)5Rem , Tg(Mx1-cre)29-4Her , Tg(Myh11-cre,-EGFP)2Mil , Tg(Nes-cre)1Kin , Tg(Neurog3-cre)24Syos , Tg(Neurog3-cre)CAble , Tg(Nr5a1-cre)1Knor , Tg(Nr5a1-cre)2Klp , Tg(Nr5a1-cre)2Lc , Tg(Nr5a1-cre)7Lowi , Tg(Osr1-cre)4Mrt , Tg(Pax2-cre)10Shwl , Tg(Pbsn-cre)20Fwan , Tg(Pcp2-cre)1Amc , Tg(Pcp2-cre)2Mpin , Tg(Pf4-cre)Q3Rsks , Tg(Pgk2-cre)1Yna , Tg(Pip1-cre)3Pop , Tg(Pomc1-cre)16Lowi , Tg(Pres-cre)1Jnz , Tg(Prm1-cre)1Osb , Tg(Prrnp-cre)ERT2 , Tg(Rarrb-cre)1Bhr , Tg(REN-cre)1Hi , Tg(Rxfp2-cre)1Aia , Tg(Rxfp2-cre)5Aia , Tg(S100a4-cre)1Egn , Tg(Scx-cre)Hshuk , Tg(Sim1-cre)1Lowi , Tg(Slc01-cre)ERT2 , Tg(Mrks , Tg(Sprt2-cre)1Dcas , Tg(Str8-cre)1Reb , Tg(Sypc1-cre)4Min , Tg(Tagn-cre)1Her , Tg(Tbx18-cre)1Fech , Tg(Tek-cre)53265Ato , Tg(Tek-cre)ERT2 , Tg(Tex101-cre)2Lzj , Tg(T-cre)1Vln , Tg(Tie1-cre)9Ref , Tg(Tmem100-EGFP/cre)ERT2 , Tg(30Amc , Tg(TNS4-cre)1Shlo , Tg(TSPY-cre)33aYfc , Tg(Vav1-cre)1Awr , Tg(Vav1-cre)8Cap , Tg(Vav-A2Kio , Tg(Vil-cre)997Gum , Tg(Wfs1-cre)ERT2 , Tg(Wnt3-cre)11Rth , Tg(Zp3-cre)93Kw , Th^{tm1}(cre)16 , Twist2^{tm1.1}(cre)Dor , Vip^{tm1}(cre)Zjh (less)
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Below, Result of Step 3. The enlarged image was made by dragging the image corners. If you click an image, the image legend and attribution pops up to the right of the image. Multiple images may be enlarged and moved as you work. Note the 'Reset Images' Button (arrow) that can be used to bring all images enlarged or moved back to their original size and placement on this page.

Tg(Pbsn-cre)4Prb - Reproductive System

Recombinase Activity Detail

Allele Information | Tissue Information | Images | Recombinase Activity | References

Allele Information	Allele: Tg(Pbsn-cre)4Prb transgene insertion 4, Pradip Roy-Burman Synonym: PB-Cre4, PB-Cre, PbCre4, ARR2PB-Cre Molecular description: The transgene is composed of the cre recombinase gene under the control of a composite promoter derived from rat Pbsn. The rat Pbsn promoter drives postnatal transgene expression in the prostate epithelium. The transgene is expressed postnatally in prostatic epithelium with the highest level of expression in the lateral lobe of the prostate & very low level of transgene expression was detected in the seminal vesicles, testes, and ovaries. No transgene expression was detected in any of the other tissue types examined. Find mice (IMSR): Mouse Strains: 1 lines available Cell Lines: 0 lines available																		
Tissue Information	Reproductive System Other recombinase alleles with activity in Reproductive System tissues: Alp^{tm1}(cre)Nagy , Amhr2^{tm3}(cre)Bhr , Calb2^{tm1}(cre)Zjh , Cck^{tm1.1}(cre)Zjh ...(more)																		
Images	<p>Drag images to compare to others or to data in the table below. Drag corners to resize images for more detail. Reset Images</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>J:68167 Fig. 2</p> </div> <div style="text-align: center;">  <p>J:68167 Fig. 3</p> </div> <div style="text-align: center;">  <p>J:68167 Fig. 4</p> </div> <div style="text-align: center;">  <p>J:68167 Fig. 5</p> </div> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>J:68167 Fig. 5 Drag image, resize at corners.</p> <p>close X</p> <p>Abbreviations - vp, ventral prostate lobe; dp, dorsal/lateral prostate; ip, lateral prostate lobe; B, bladder; DD, ductus deferens. Arrows in A - recombination activity in prostatic buds. Scale bars - A,B,C 0.1 mm; D 1 mm.</p> <p>Reprinted with permission from Elsevier from doi:10.1016/S0925-4773(00)00551-7 Mech Dev 101: 61-9; Wu X; Wu J; Huang J; Powell WC; Zhang J; Matusik RJ; Sangiorgi FO; Maxson RE; Sucov HM; Roy-Burman P. Generation of a prostate epithelial cell-specific Cre transgenic mouse model for tissue-specific gene ablation. Copyright 2001</p> <p>Drag image to compare to others or to data in the table below. Drag corners to resize image for more detail.</p> </div>																		
Recombinase Activity	<p>Click heading to re-sort table. i</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Structure</th> <th style="width: 15%;">Assayed Age</th> <th style="width: 15%;">Level</th> <th style="width: 15%;">Pattern</th> <th style="width: 15%;">Reference, Source</th> <th style="width: 15%;">Assay Type</th> <th style="width: 15%;">Reporter Gene</th> <th style="width: 15%;">Detection Method</th> <th style="width: 15%;">Assay Note</th> </tr> </thead> <tbody> <tr> <td>ductus deferens</td> <td>postnatal week 8</td> <td>Ambiguous</td> <td>Not Specified</td> <td>J:68167 Fig. 2A</td> <td>Recombinase reporter</td> <td>lacZ</td> <td>direct</td> <td></td> </tr> </tbody> </table>	Structure	Assayed Age	Level	Pattern	Reference, Source	Assay Type	Reporter Gene	Detection Method	Assay Note	ductus deferens	postnatal week 8	Ambiguous	Not Specified	J:68167 Fig. 2A	Recombinase reporter	lacZ	direct	
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ductus deferens	postnatal week 8	Ambiguous	Not Specified	J:68167 Fig. 2A	Recombinase reporter	lacZ	direct												

Finally, we learn about phenotypes observed when mice carrying a particular cre transgene/knock-in are mated to mice carrying different genes with loxP sites (genes that will be knocked-out when exposed to cre recombinase).

Phenotype data can be accessed either :

1. By clicking on the [phenotype data](#) link in the cre search summary page (see page 5 of the tutorial).

OR 2. By clicking on the [transgene or knock-in symbol](#) on the Recombinase Detail page (starting at page 5 of the tutorial)

You searched for...
Driver equals **Pbsn**
Click column headings to sort table data. Drag headings to rearrange columns.

Driver	Allele Symbol Gene; Allele Name	Recombinase Data	Nervous System	Reproductive System	Find Mice (IMSR)	Refs
Pbsn	Hprt ^{tm1(Pbsn-cre)RT2} Ir hypoxanthine guanine phosphoribosyl transferase; targeted mutation 1; Frank R Jirik (phenotype data)	No data available				2
Pbsn	Tg(Pbsn-cre)20Fwan transgenic insertion 20; Fen Wang (phenotype data)	► Detected in 1 system. ► Not detected in 2 systems.		Detected		6
Pbsn	Tg(Pbsn-cre)4Prb transgenic insertion 4; Pradip Roy-Burman (phenotype data)					
Pbsn	Tg(Pbsn-cre)8113ANG transgenic insertion 8113A; Norman M Greenberg (phenotype data)					

Tg(Pbsn-cre)4Prb - Reproductive System
Recombinase Specificity Detail

[Allele Information](#) | [Tissue Information](#) | [Images](#) | [Recombinase Specificity](#) | [References](#)

Allele Information	Allele: Tg(Pbsn-cre)4Prb transgenic insertion 4; Pradip Roy-Burman	Driver: Pbsn Type: Transgenic (Cre/Flp)
Synonym:	ARR2PB-Cre, PB-Cre, PB-Cre4, PbCre4	
Molecular description:	The transgene is composed of the cre recombinase gene under the control of a composite promoter derived from rat Pbsn. The rat Pbsn promoter drives postnatal transgene expression in the prostatic epithelium. The transgene is expressed postnatally in prostatic epithelium with the highest level of expression in the lateral lobe of the prostate gland. A very low level of transgene expression was detected in the seminal vesicles, testes, and ovaries. No transgene expression was detected in any of the other tissue types examined.	
Find mice (IMSR):	Mouse Strains: 1 lines available Cell Lines: 0 lines available	

Tissue Information	Reproductive System	Other recombinase alleles with activity in Reproductive System tissues: ► Atp^{tm1(cre)Nagy} , Amhr2^{tm3(cre)Cbn} , Cdkn2a^{tm3(cre)Cbn} , Chat^{tm1(cre)Low} ... (more)
Images	Drag images to compare to others or to data in the table below. Drag corners to resize images for more detail. Reset Images	

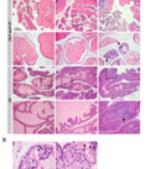
Recombinase Specificity		Click heading to resort table. i						
Structure	Assayed Age	Level	Pattern	Reference, Source	Assay Type	Reporter Gene	Detection Method	Assay Note
ductus deferens	postnatal week 2	Ambiguous	Not Specified	J:68167 Fig. SD	Recombinase reporter	lacZ	Direct Detection	
ductus deferens	postnatal week 8	Ambiguous	Not Specified	J:68167 Fig. 2A	Recombinase reporter	lacZ	Direct Detection	

This is the **Transgene detail page for Tg(Pbsn-cre)4Prb**, which contains the phenotype data. Like the Recombinase Activity page for the Reproductive System, the information at the top of the page is basic information on nomenclature, the description of the molecular construct and includes links to IMSR to obtain mice carrying this transgene. There is also a section summarizing recombinase activity with links to the Recombinase Activity pages as we have reviewed previously. Two phenotype sections on this page, labeled

Tg(Pbsn-cre)4Prb
Transgene Detail

[Your Input Welcome](#)

Nomenclature | Transgene origin | Transgene description | Expression | Recombinase activity | Phenotypes | Disease models | Find Mice (IMSR) | References

Nomenclature	Symbol: Tg(Pbsn-cre)4Prb Name: transgene insertion 4, Pradip Roy-Burman MGI ID: MGI:2385927 Synonyms: ARR2PB-Cre, PB-Cre, PbCre4, PB-Cre4 Transgene: Tg(Pbsn-cre)4Prb Location: unknown	Prostate hyperplasia and low-grade prostate intraepithelial neoplasia in <i>Brcac2^{tm1Bm}/Brcac2^{tm1Bm}</i> Tg(Pbsn-cre)4Prb/0 mice Show the 9 phenotype image(s) involving this allele. 																																																																																																																																																																																					
Transgene origin	Strain of Origin: (C57BL/6 x DBA/2)F1																																																																																																																																																																																						
Transgene description	Transgene Type: Transgenic (Recombinase) Mutation: Insertion	▼ Mutation details: The transgene is composed of the cre recombinase gene under the control of a composite promoter derived from rat Pbsn. The rat Pbsn promoter drives postnatal transgene expression in the prostatic epithelium. The transgene is expressed postnatally in prostatic epithelium with the highest level of expression in the lateral lobe of the prostate gland. A very low level of transgene expression was detected in the seminal vesicles, testes, and ovaries. No transgene expression was detected in any of the other tissue types examined. (J:68167)																																																																																																																																																																																					
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(A) Phenotypes and (B) Genotypes are described below.

Affected Systems	cn1	cn2	cn3	cn4	cn5
Sex:	♂	♂	♂	♂	♀ ♂
cellular	▶				
endocrine/exocrine glands	▶		✓	✓	
homeostasis/metabolism	▶				
immune system	▶				
mortality/aging	▶				
renal/urinary system	▶				
reproductive system	▶	circled		✓	✓
tumorigenesis	▶	✓	✓	✓	✓
reproductive system					
reproductive system phenotype					
abnormal bulbourethral gland morphology					
abnormal prostate gland morphology					
enlarged prostate gland anterior lobe					
abnormal prostate gland branching morphogenesis					
abnormal prostate gland epithelium morphology					
prostate gland epithelial hyperplasia					
decreased prostate gland weight					
enlarged prostate gland					
increased prostate gland weight					
prostate gland hyperplasia					
abnormal prostate gland physiology					
prostate gland inflammation					
female infertility					
MGI					
Rfwd2 ^{tm2.1Vmd} /Rfwd2 ^{tm2.1Vmd}					
Tg(Pbsn-cre)4Prb/0					
B6N.Cg-Rfwd2 ^{tm2.1Vmd} Tg(Pbsn-cre)4Prb					
Key:					
♀ phenotype observed in females					
♂ phenotype observed in males					
N normal phenotype					
Wellcome Trust Sanger Institute					
EuPh Europhenome					

A. The Phenotypes Section provides a high-level look at the kinds of systems affected in mice carrying this transgene in conjunction with other genes (the genotype). This section displays a matrix of 'Affected systems' (left column) by Genotype (row), where each abbreviation along the top of the matrix represents a unique genotype. As in other examples, there is a toggle (▶) that expands the table to more detailed data. Left, a copy of the table from the Phenotype Page (page 10) with the toggle circled. Below, the expansion of the reproductive system terms attributed to various genotypes.

reproductive system	
prostate gland hyperplasia (J:172653)	
♂ • In 3 of 4 mice at 40 weeks of age (J:172653)	
• In all mice at 52 weeks of age (J:172653)	
abnormal prostate gland physiology (J:172653)	
♂ • cells in the ventral and lateral prostate exhibit increased proliferation compared to in wild-type mice (J:172653)	
tumorigenesis	
prostate intraepithelial neoplasia (J:172653)	
♂ • low grade in 2 of 6 mice at 52 weeks of age (J:172653)	
endocrine/exocrine glands	
prostate gland hyperplasia (J:172653)	
♂ • In 3 of 4 mice at 40 weeks of age (J:172653)	
• In all mice at 52 weeks of age (J:172653)	
abnormal prostate gland physiology (J:172653)	
♂ • cells in the ventral and lateral prostate exhibit increased proliferation compared to in wild-type mice (J:172653)	

B. Genotypes. Each genotype includes its allelic composition and genetic background. The third conditional genotype described, cn3, includes the Tg(Pbsn-cre)4Prb transgene and Rfwd2 targeted alleles on a congenic B6N background. Click on the cn3 button to open a new window containing phenotypic details reported in the mice (shown at left).

4. Return to the Cre Portal main page & view the data report for ‘all cre transgenes/knock-ins’

Find the Cre Portal main page using <http://www.creportal.org>. Locate the “Retrieve All Alleles Section” and choose either the MGI Recombinase Alleles Report (an html page view format) or the Tab-delimited version if you wish to copy the file into Excel or some other analysis program.

Recombinase (cre) Activity

MGI collects and annotates expression and activity data for recombinase-containing transgenes and knock-in alleles.

Access Data

FIND RECOMBINASE-CARRYING ALLELES

Search for alleles assayed for specificity/activity in an anatomical structure.

Recombinase activity in: Go

Search for alleles by promoter/driver activity.

Recombinase driven by: (choose one) Go

RETRIEVE ALL ALLELES

Retrieve a list of all recombinase-containing transgenes and knock-in alleles.

[MGI Recombinase Alleles Report](#)
[Tab-delimited version](#)

FAQs

How do I...

- .. find existing recombinase-expressing transgenes and knock-ins that have a given promoter (driver)? [FAQ](#)
- .. find the promoter (driver) that I'm looking for if it is not on the selection list? [FAQ](#)
- .. find a recombinase-containing transgene or knock-in that is expressed in a specific tissue? [FAQ](#)
- .. get a full list of all transgenes and knock-ins that express recombinase? [FAQ](#)
- .. order mice with a desired recombinase construct? [FAQ](#)

[More FAQs](#)
[Cre Portal Tutorial](#)

Recombinase Allele Data Include

12 Jun 2013

560 Recombinase-containing knock-in alleles
1,383 Recombinase-containing transgenes
1,943 Total recombinase transgenes and alleles
544 Drivers in recombinase transgenes

Step 1. Locate the file link of interest.

Step 2. Follow the link. Here a few lines of the html web page version are shown.

MGI Recombinase Alleles Report

This report provides a list of all recombinase-containing alleles in the MGI database.

Each allele symbol is linked to its respective MGI Allele Detail page, containing phenotypic and disease model data; each Anatomical System for an allele is linked to its MGI Recombinase Detail page. A link is provided to the International Mouse Strain Resource (IMSR) strain if a repository holds mice carrying the listed allele.

To search for floxed, frt, or other recombinase target-containing alleles in MGI, use the [Phenotype and Alleles Query Form](#).

To search repositories for specific strains carrying mutations of all types, use the [IMSR Search Form](#).

Driver	Allele Symbol	Name	Detected in	Absent in	IMSR Strain	Allele ID
8430408G22Rik	B430408G22Rik^{m1(EGFP)cre}Shn	RIKEN cDNA 8430408G22 gene; targeted mutation 1, Donghun Shin				MGI:3526084
A930038C07Rik	Tg(A930038C07Rik-cre)4Aibs	transgene insertion 4, Ed Lein			B6;C3-Tg(A930038C07Rik-cre)4Aibs/J	MGI:3850200
AAT	Tg(AAT-cre)31Rbrc	transgene insertion 31, RIKEN BioResource Center			C57BL/6J-Tg(AAT-cre)31Rbrc/Rbrc	MGI:4415186
AAT	Tg(AAT-cre)43Rbrc	transgene insertion 43, RIKEN BioResource Center			C57BL/6J-Tg(AAT-cre)43Rbrc/Rbrc	MGI:4415189
AAT	Tg(AAT-cre)50Rbrc	transgene insertion 50, RIKEN BioResource Center			C57BL/6J-Tg(AAT-cre)50Rbrc/Rbrc	MGI:4415191
Abpa	Tg(Abpa-cre)1Cm1	transgene insertion 1, Charles M Allan	reproductive system			MGI:4431035
Acan	Acan^{m1(cre)ERT2Cm}	aggrecan; targeted mutation 1, Benoit de Crombrughe	embryo-other limbs postnatal-other respiratory system sensory organs	cardiovascular system liver & biliary system nervous system renal & urinary system		MGI:4420223
Acp5	Tg(Acp5-cre)4Rda	transgene insertion 4, Rachel A Davey	alimentary system cardiovascular system head liver & biliary system postnatal-other respiratory system			MGI:3053813
Acp5	Tg(Acp5-cre)3Rda	transgene insertion 3, Rachel A Davey	alimentary system head hemolymphoid system liver & biliary system postnatal-other			MGI:3053816

Self Directed Tasks

1. Using the Cre Portal, find cre carrying transgenes or knock-ins that are driven by *AMH*.

How many are there?

Which one do you think has been used most experimentally?

Are any mice available with these cre transgenes from public repositories? If so, from where?

For the *AMH* driven cre transgenes, what tissues are listed as “not detected” for cre recombinase activity?

What ages were assayed?

(explanation note: You will note that the search is case in-sensitive. In your results you will see *AMH* and *Amh* cre alleles. This is because nomenclature follows that of the species where the gene originated. *AMH* is the human gene (all capital letters); *Amh* is the mouse gene (first letter only capitalized).

2. For *Plekha5^{Tg(AMH-cre)1Flor}*, what tissues were reported with staining ‘Present’ (indicating cre activity) at postnatal day 35?

What reporter gene was used in the assays for *Plekha5^{Tg(AMH-cre)1Flor}* and *Tg(Amh-cre)8815Reb*?

3. For *Plekha5^{Tg(AMH-cre)1Flor}*, when mated to other targeted mutations, what other classes of phenotypes are observed in addition to “reproductive” related?

Answers (These are likely to change due to database updates, etc.)

1. From www.creportal.org, select the driver *Amh* in the ‘search for alleles by promoter/driver specificity’ and then click ‘GO’.

There are 6 cre transgenes with an *Amh* driver. Two are driven by the human *AMH* promoter, the other 4 by the mouse *Amh* promoter. These symbols follow species’ nomenclature convention. You can also learn this by reading the molecular description in the transgene detail pages.

Because there are 107 references for *Plekha5^{Tg(AMH-cre)1Flor}*, this allele is likely to have been used most frequently.

Yes, 2 of these cre transgenes are available from public repositories.

Plekha5^{Tg(AMH-cre)1Flor} is available from the EMMA repository (EM) in Europe as frozen embryos.

Tg(Amh-cre)8815Reb is available from the Jackson Laboratory repository (JAX) as sperm.

On the summary page, for the *Plekha5^{Tg(AMH-cre)1Flor}* transgene, in the Recombinase Activity Not Detected column, the data indicate recombinase (cre) activity is not detected in the anatomical class “embryo-other”. Following this link to this ‘anatomical class’ one sees that cre activity was not detected at embryonic day 12.5 and 13.5.

2. For *Plekha5^{Tg(AMH-cre)1Flor}* at day 35, staining was found in ovary antral follicle, ovary secondary follicle and ovary stratum granulosum.

The reporter gene for cre transgene *Plekha5^{Tg(AMH-cre)1Flor}* was *lacZ*; for cre transgene *Tg(Amh-cre)8815Reb*, the reporter gene was hemagglutinin.

3. Through the “phenotype data” link for *Plekha5^{Tg(AMH-cre)1Flor}*, you can see that there are cellular, endocrine/exocrine gland, homeostasis/metabolism, and immune system phenotypes observed.

We welcome your feedback in improving this resource. Contact us through the “Contact Us” link in the navy blue navigation bar at the far right; or email mgi-help@jax.org