# Leveraging conditional IKMC alleles: Cre driver strain resources

- Enabling access: critical role for Repositories
  - Live versus cryo
  - Quality control: transfer of responsibility
  - Directed versus "laissez faire" promotion strategies
- Detailed characterization
  - Add to and complement published data
  - Particularly important for Cres developed in large sets
  - Positive AND negative data
- Data dissemination
  - Centralized sources of Cre functional data
 - CREATE BioMART and CrePortal

Cre strain distribution
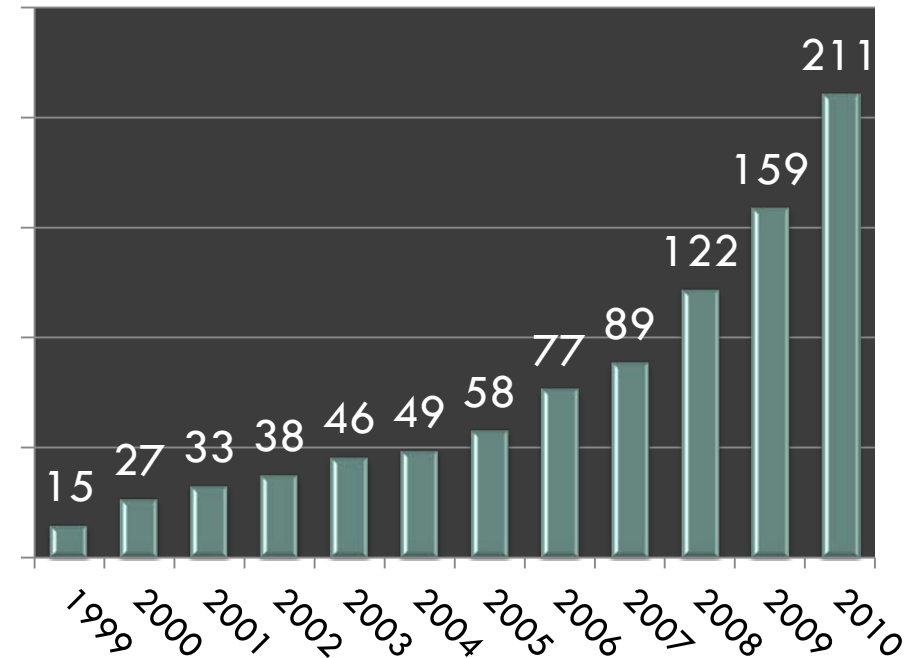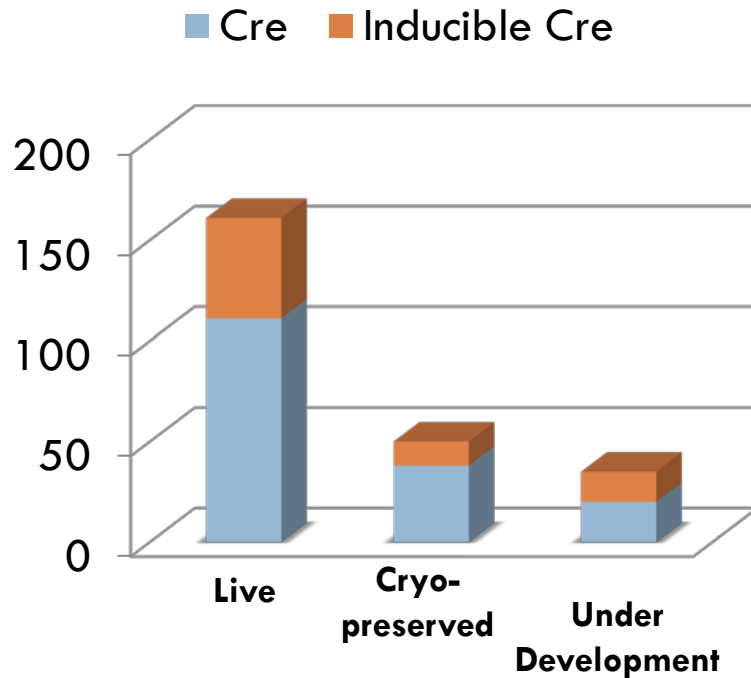
Growth increasingly driven by large sets (e.g. Neuroscience Blueprint) that have limited community use prior to distribution.

Open question: how do we best manage our Cre strain distribution to best serve the community?

# Comprehensive characterization of Cre driver pipeline (cre.jax.org)

-R26R-LacZ Reporter strain

-Four time points: E10.5, E15.5, P7 and P56 (adult)

-Whole-mount (E10.5) or frozen sections

-Full necropsy at P7 and P56 (11 organ systems, 30 organs/structures, 89 substructures)

-NanoZoomer slide scanner to capture data at 20X

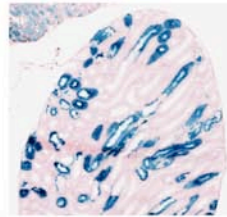-Data collected for 45 strains, 44 in progress

-Data delivered to creportal.org

20X Lung

10X Heart

20X Skin
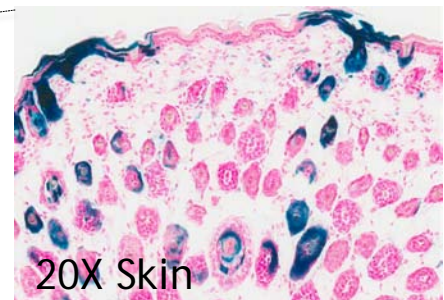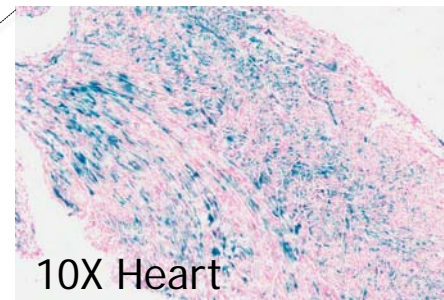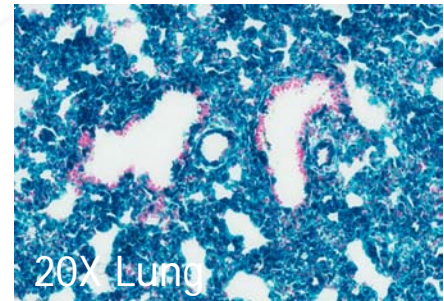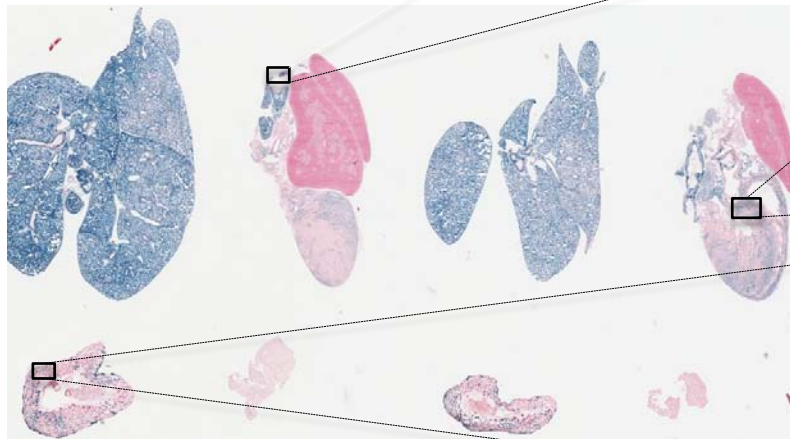
129(Cg)-*Foxg1$^{tm1(cre)Skm}$/J Characterized with R26R LacZ Reporter*

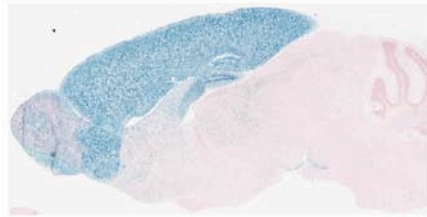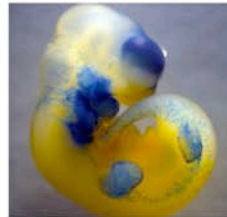# Off-target Cre activity: a surprisingly common problem
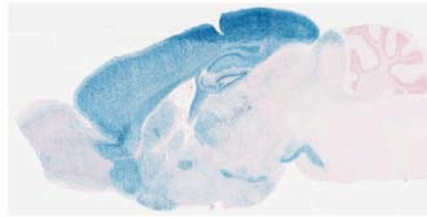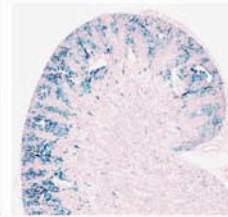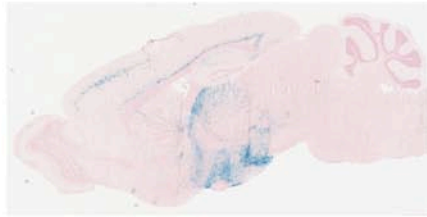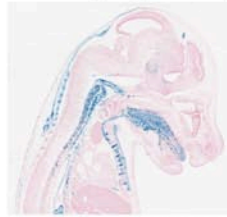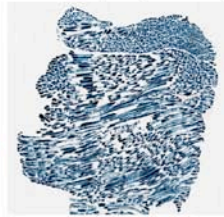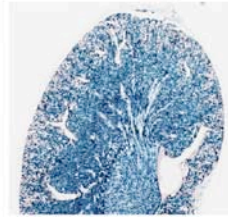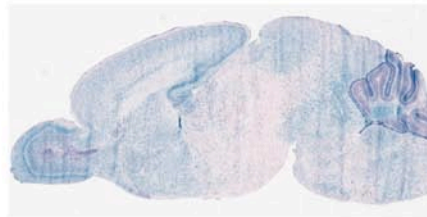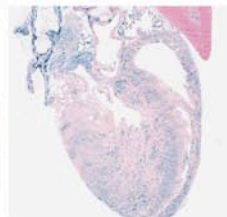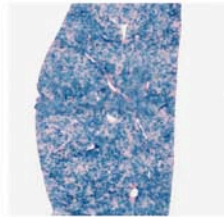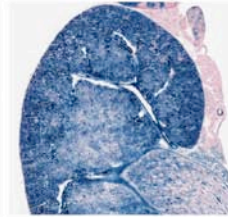
Ectopic* activity continued
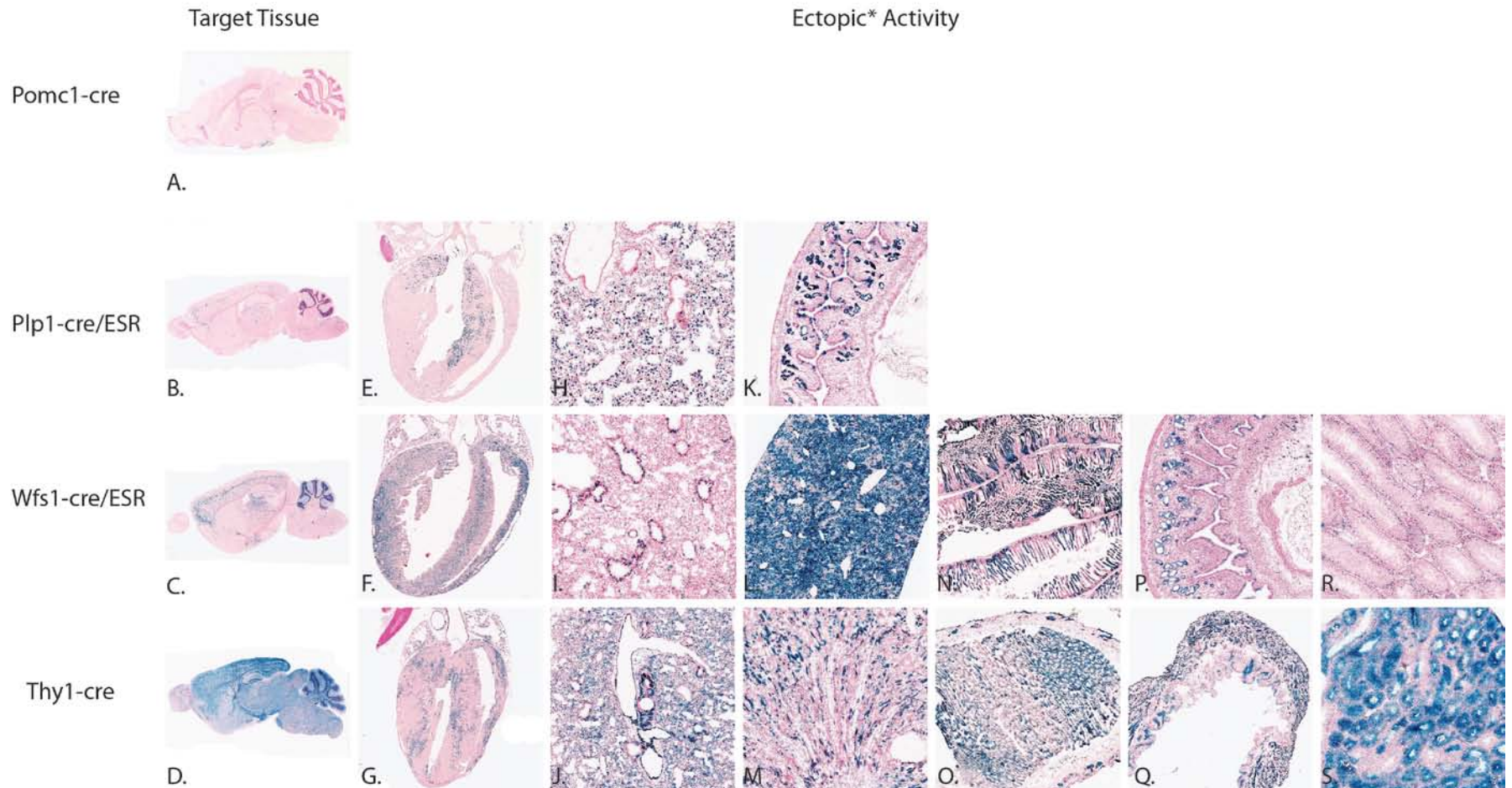
Inconsistent activity

Regionally Restricted | Widespread

B6.Cg-Tg(Tek-cre)12Flv/J

A. | B.
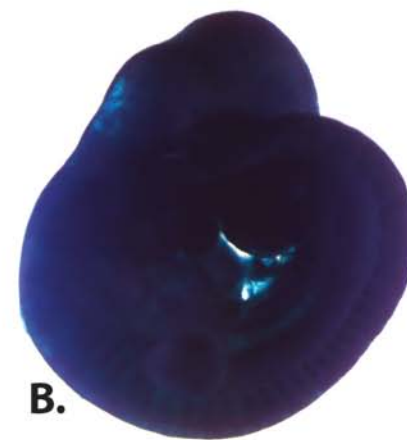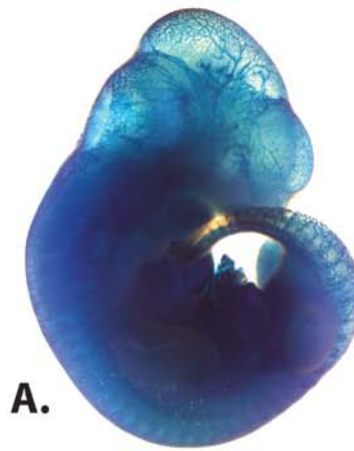
B6.Cg-Tg(Vav1-cre)A2Kio/J

C. | D.

Recombinase (cre) Home (www.creportal.org)

Recombinase (cre) Specificity

MGI collects and annotates expression and activity data for recombinase-containing transgenes and knock-in alleles.
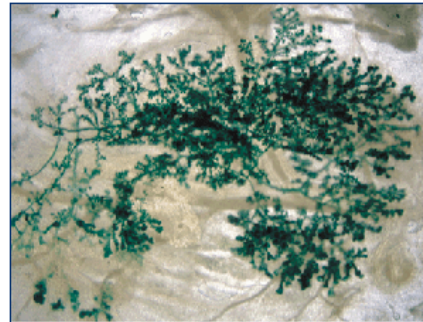
Image reproduced with permission of the Journal of Cell Science.
Rijnkels M and Rosen, JM, J Cell Sci 2001, 114(17): 3147-3153.

Access Data

FIND RECOMBINASE-CARRYING ALLELES

Search for alleles assayed for specificity/expression in a particular anatomical system.

Recombinase specificity in: (choose one) | Go

Search for alleles by promoter/driver specificity.

Recombinase driven by: (choose one) | Go

Search for cre activity by anatomical system or by driver/promoter

RETRIEVE ALL ALLELES

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

MGI Recombinase Alleles Report

Tab-delimited version

Get a report of all recombinase knock-ins and transgenes

FAQs

How do I...

.. find existing recombinase-expressing transgenes and knock-ins that have a given promoter (driver)? FAQ

...e? FAQ

12 Mar 2010

Drivers in recombinase knock-in alleles

issued in recombinase specificity assays

More...

1,516 total Cre driver strains

~50% fully curated for Cre activity

October 29, 2009

curated from the scientific literature and integrated from projects underway at collaborating organizations. (See the **Collaborators** tab, below).
...lleles) consortium.

Tg(AMH-cre)1Flor - Reproductive System
Recombinase Specificity Detail

Allele Information | Tissue Information | Images | Recombinase Specificity | References
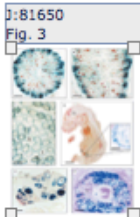
Allele Information		
Allele:	**Tg(AMH-cre)1Flor** transgene insertion 1, Florian Guillou	**Driver:** AMH **Type:** Transgenic (Cre/Flp)
Synonym:	AMH-	
Molecular description:	The t...	...ene, and genomic sequences from MT1 to... show... ...male mice and granulosa cells of 16 day o...
Find mice (IMSR):	Mou...	...able
Additional Tissues:	Tg(A... alim...	

• Molecular description of the transgene or knock-in
• Links to mice in IMSR
• Other tissues with cre activity

Tissue Information		
Reproductive System	Othe... ...em tissues: ▶ Alp... ...m1(cre)Lowl ...(more)	

Other recombinase knock-ins/Tgs with activity in reproductive system

Images

Drag images to compare to others o... ...e detail. **Reset Images**

J:81650
Fig. 3

Gallery of images for this cre in this tissue/organ

Recombinase Specificity

Click heading to resort table. ℹ

Structure	Assayed				Assays	Genotypic Background	Result Notes
					Assay Type	Reporter Gene	Detection Method	Assay Note
testis	embryo... 15				Recombinase reporter	lacZ	Direct Detection	
seminiferous tubule	postnatal week 9	Present	Regionally restricted	J:157337 Fig. S1C right panel *Figure not shown*	Recombinase reporter	lacZ	Direct Detection	

Recombinase activity data

| References	
All for this allele:	34 reference(s)

Link to References

Cre strains for KOMP2, IMPC

- Cre deleter
  - C57BL/6N background
  - Highly efficient
  - Maternal deletion 'feature' (Sox2-Cre; ICS Cre-GFP)

- FLPe germline deleter strains on B6N needed to convert to conditional alleles

- Inducible Cre (ERT2) and tissue specific Cre strains for use with lethals

- Need to move well-characterized, well-published Cres to B6N

JAX Cre deleter choice: Sox2-Cre

Sox2-Cre♀   Chimera ♂

X

KO+/-; Cre -

X
Cohort breeding
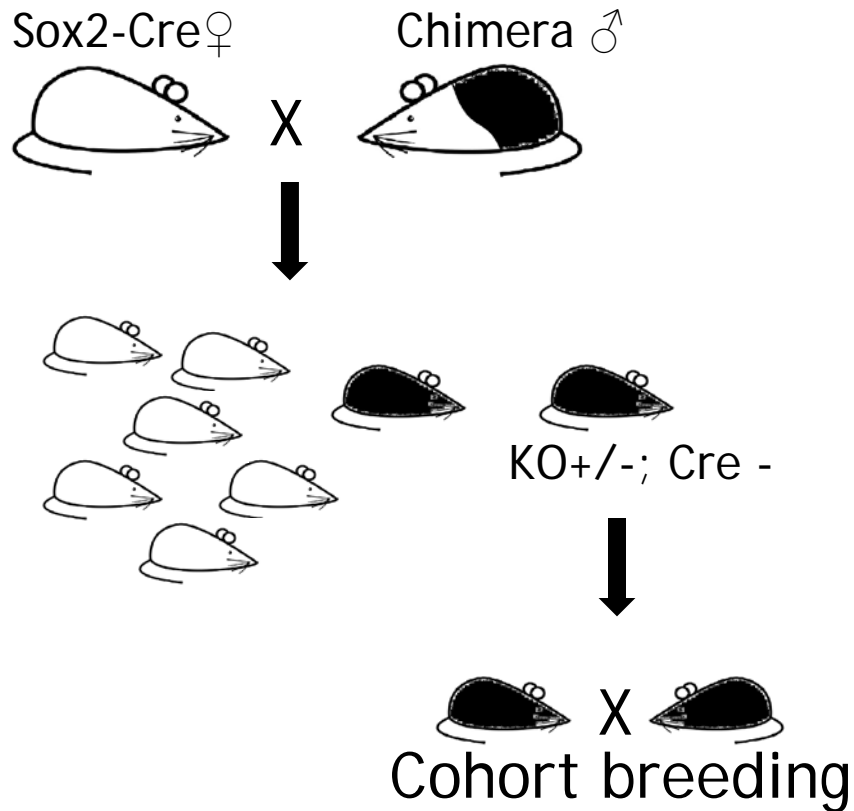
- Deletion activity independent of Cre allele segregation
  - Speed congenic to C57BL/6N using new N/J SNP panel

Comparison of ubiquitous CreER lines

	Brain	Heart	Muscle/Skin	Kidney	Liver
UBC-cre/ERT2					
CAG-cre/Esr1					
ROSA26-cre/ERT					
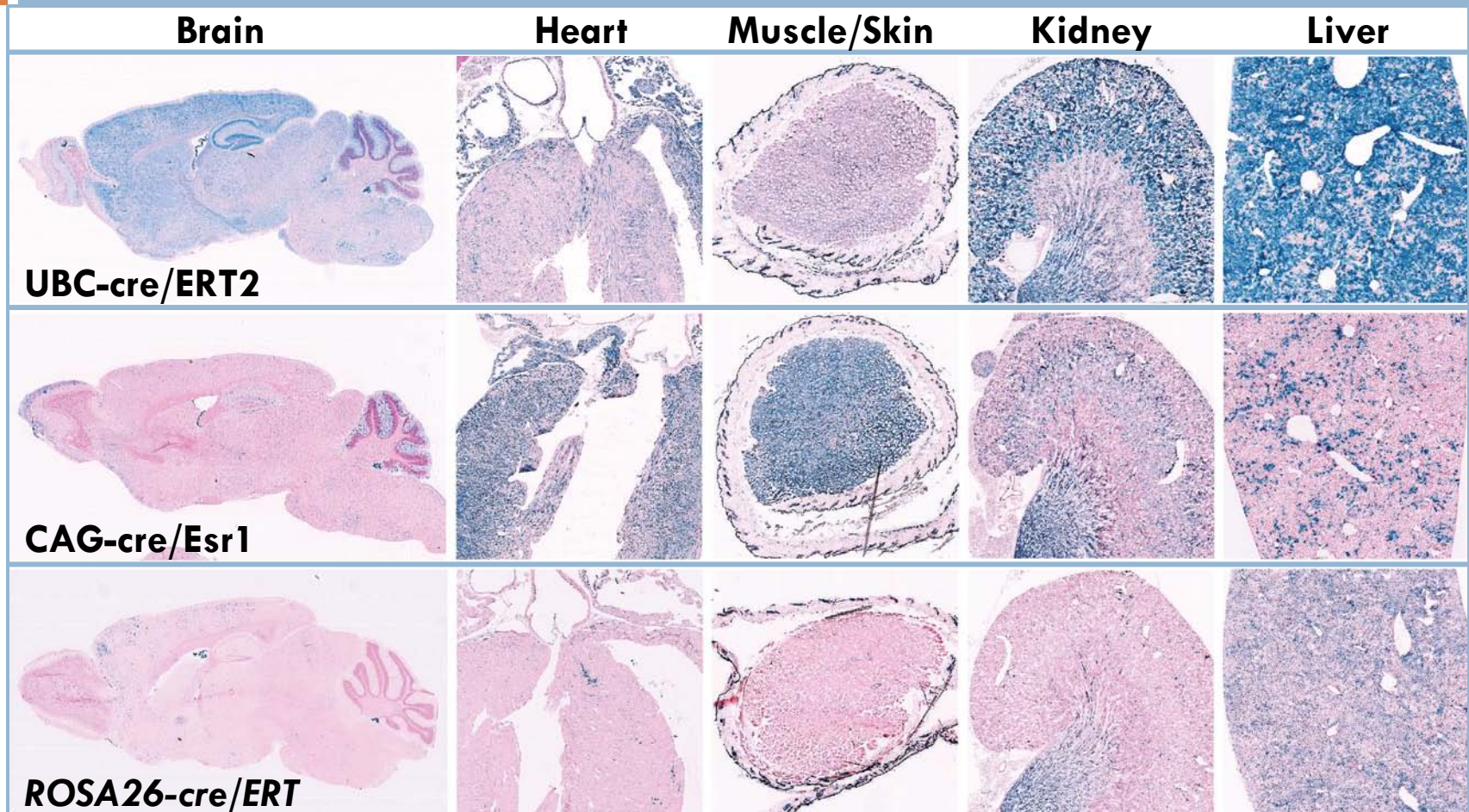
Thanks to…

Cre Characterization Pipeline
Caleb Heffner
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Leah Rae Donahue
Cat Lutz
Steve Rockwood
Mike Sasner

CrePortal
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Kim Forthofer
Peter Frost
Martin Ringwald
James Kadin