ALLEN INSTITUTE for BRAIN SCIENCE

TECHNICAL WHITE PAPER:
RESOURCES: GENOTYPES OF MICE USED IN THE ALLEN BRAIN OBSERVATORY

OVERVIEW

This table describes the specimens used for the Allen Brain Observatory calcium imaging data. The full genotype is shown, with both alleles noted per gene; Ai93 refers to the reporter gene, which contains the reporter TITL-GCaMP6f. The experiment containers, along with area and depth of imaging, are shown that correspond to each specimen. Special notes are provided on particular specimens where applicable.

Epileptiform events refers to the occurrence of abnormal calcium activity detected in conjunction with widespread expressionof GCaMP6. This refers to the presence of unusually large (>1 mV), long (width >10 ms) and correlated events in large portions of the dorsal cortex in affected animals, that resemble epileptiform inter-ictal events (Steinmetz et al., 2017). It is important to note that no seizures have been observed, and a screening step to exclude such animals from the pipeline has now been implemented.

Localized Deformation refers to the indentation of cortex or cerebellum observed after brain dissection and tissue analysis. These deformations appear to be related to the surgery. Any specimen with an overly large deformation, or deformation affecting the area of the surgical window was excluded from the dataset. A preliminary analysis showed no differences between the deformed and normal brains.

Enlarged Brain Ventricle may be due to either an existing enlargement in vivo, or a deformation that occurred during dissection. The impact on analysis is unknown.

Table 1. Genotypes and notes about specimens in the Allen Brain Observatory.

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
221470	Scnn1a-Tg3-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		511507811	VISp	350
222179	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		511506664	VISp	275
			511507602	VISpm	275
222181	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		511507144	VISp	275
			511510733	VISpm	275
222420	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93		511510664	VISal	175
			511509529	VISp	175
			511510667	VISp	275
222424	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93		511507650	VISp	175
			511510817	VISpm	175
			511510776	VISpm	275

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
222425	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511510695	VISal	175
			511510650	VISp	175
			511510927	VISp	275
222426	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93	Localized Deformation	511510715	VISal	175
			511510640	VISl	175
			511510736	VISp	175
222431	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		511510723	VISal	275
			511510627	VISl	275
			511510989	VISp	275
225036	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93		511510797	VISal	175
			511510779	VISp	275
			511510753	VISpm	175
225037	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93		511510670	VISp	175
			511510699	VISp	275
			511510822	VISpm	175
225039	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93		511510688	VISl	175
			511510645	VISpm	175
226219	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt	Localized Deformation	511510710	VISal	375
			511510896	VISp	375
			511510658	VISpm	375
228378	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93		511511052	VISal	275
			511510884	VISp	175
228379	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511510867	VISal	275
			511510994	VISl	175
228786	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		511510860	VISal	275
			511510729	VISl	275
			511510675	VISp	275
			511511001	VISpm	275
229105	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93	Epileptiform Events	511510998	VISal	175
			511510681	VISpm	175
229106	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511510855	VISp	175
			511510914	VISpm	175
			511510940	VISpm	275
229107	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511510917	VISl	175
			511510945	VISl	275

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
229109	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511510848	VISl	275
			511510836	VISpm	275
229470	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511510893	VISpm	175
229482	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		511511029	VISl	275
230570	Scnn1a-Tg3-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		511510911	VISp	350
231120	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		511510794	VISal	275
231584	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511510788	VISl	175
			511510718	VISp	175
231585	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511856567	VISal	275
			511510870	VISl	275
			511498500	VISpm	275
231951	Scnn1a-Tg3-Cre/wt;Camk2a-tTA/wt;Ai93/wt		511510955	VISp	275
231953	Scnn1a-Tg3-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		511498742	VISp	350
232623	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		511500480	VISal	275
			511511011	VISl	275
			511510748	VISpm	275
233214	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511976252	VISpm	175
233215	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		511854338	VISal	275
			511511083	VISpm	175
233442	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/Ai93		511499656	VISal	375
			511510758	VISp	375
			511511006	VISpm	375
234584	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/Ai93		511511089	VISl	375
			511511015	VISpm	375
234589	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		511510763	VISl	375
234831	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		512124562	VISp	275
237706	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93	Epileptiform Events	517328083	VISp	175
			527676429	VISp	275
243293	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		524691282	VISp	275

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
244884	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		526481129	VISp	275
244896	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93	Epileptiform Events	527550471	VISp	275
244898	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93		529487170	VISl	275
			528959519	VISp	275
246775	Scnn1a-Tg3-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93	Localized Deformation	531134088	VISp	335
			528889127	VISp	350
248894	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		528792730	VISp	350
248895	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		528799602	VISp	350
249122	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		530739574	VISp	275
249136	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/Ai93	Localized Deformation	529770662	VISp	375
250605	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		529763300	VISp	350
250606	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt	Enlarged Brain Ventricle	539291370	VISp	335
			531100608	VISp	350
250789	Scnn1a-Tg3-Cre/wt;Camk2a-tTA/wt;Ai93/wt	Localized Deformation	535575493	VISp	275
			540993888	VISp	350
251214	Cux2-CreERT2/Cux2-CreERT2;Camk2a-tTA/wt;Ai93/Ai93	Epileptiform Events, Localized Deformation	530243910	VISp	275
252174	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		536323956	VISp	175
253302	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		531823088	VISp	275
255445	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		532233174	VISp	350
257786	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		538803515	VISp	350
260936	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt	Localized Deformation	547315012	VISl	175
			543677425	VISp	175
			545578995	VISp	375
261458	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		540168835	VISp	375
261967	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt	Localized Deformation	553452260	VISal	350
			550922597	VISl	350
			555749366	VISpm	350
261969	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		546328009	VISal	350

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
			551412362	VISam	350
			549855418	VISpm	350
262562	Scnn1a-Tg3-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		546724786	VISp	350
265161	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		551412603	VISam	275
			547561986	VISl	275
265164	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		547476353	VISal	275
			550127305	VISam	275
			546085409	VISl	275
266396	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		555042465	VISal	300
			556936862	VISpm	300
268133	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		552760668	VISam	275
			551888517	VISpm	275
			553568029	VISrl	275
268773	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/wt		556899621	VISam	175
			551657958	VISl	175
			552749238	VISl	275
270341	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		553007101	VISal	350
			560821337	VISam	325
			554037268	VISpm	350
271727	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		556665479	VISam	350
			558476280	VISl	350
			557986062	VISpm	335
271729	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		556639822	VISal	350
			554219902	VISl	350
			560782654	VISrl	350
271732	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		560722730	VISam	350
271750	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/Ai93	Localized Deformation	555327033	VISam	375
			555040113	VISp	375
			554014018	VISpm	375
273576	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/Ai93		555700037	VISal	175
			556936291	VISal	275
			557984490	VISl	275
273904	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		560821491	VISpm	325
274234	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		560820973	VISam	435

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
276947	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		558471484	VISl	175
276948	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt	Localized Deformation	557520762	VISl	175
			559792042	VISl	275
276949	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt	Localized Deformation	561463418	VISpm	175
			565039910	VISpm	375
277933	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		560578597	VISl	350
			560809200	VISpm	350
277938	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/wt		564791582	VISam	320
			566480479	VISl	325
279430	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		567919555	VISl	300
			569811199	VISp	300
279437	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		559645337	VISam	350
			560363325	VISrl	350
280638	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		561312433	VISp	275
280639	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		560753319	VISal	175
			561472631	VISal	275
			562536151	VISal	375
280643	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		560876149	VISal	175
			564791547	VISal	265
			564791561	VISal	365
282817	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/wt		565216521	VISam	175
			566307034	VISam	275
282820	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/wt		569287964	VISam	175
			566674370	VISl	275
283147	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		563364151	VISal	375
			564425775	VISl	175
283278	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/wt	Localized Deformation	570994450	VISam	175
			571541563	VISrl	175
283284	Cux2-CreERT2/wt;Camk2a-tTA/wt;Ai93/wt		566759225	VISam	275
			569645688	VISrl	175
			570008442	VISrl	275
284417	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		569251675	VISam	275
			569611977	VISpm	275

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
			569981238	VISrl	275
284418	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		569396922	VISal	275
			569718095	VISam	275
284669	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		566458503	VISam	175
			568461662	VISam	275
			569792815	VISam	375
286360	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93	Localized Deformation	570278595	VISp	350
			571039045	VISrl	350
286366	Nr5a1-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93		570428250	VISrl	350
288600	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		571137444	VISp	375
			571684731	VISpm	375
291462	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		572606380	VISl	375
291465	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		572607996	VISal	375
			575302106	VISam	375
291865	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		572376866	VISal	375
			573378109	VISl	375
292490	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		577720109	VISam	375
			575771818	VISl	375
295995	Rorb-IRES2-Cre/wt;Camk2a-tTA/wt;Ai93/wt		576411244	VISam	275
296702	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		573261513	VISl	275
			573864648	VISrl	175
			575892535	VISrl	275
296704	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/wt		574034739	VISrl	175
			575710989	VISrl	275
			576714442	VISrl	375
296708	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93-hyg/wt		574529963	VISpm	175
			575766605	VISpm	275
			576208803	VISrl	175
300663	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/wt		580051757	VISrl	375

Non-Cre-Specific Phenotype refers to the observation of widespread, non-Cre specific, GCaMP6 expression that occurs due to germline recombination that results in STOP deletion from the LoxP-STOP-LoxP cassette.

Experiments from the animals listed below had been published in earlier releases, before further analysis revealed the deletion and resulting widespread (rather than Cre-restricted) expression of the reporter gene.

For this reason, these data have been marked as failed. Operational measures have now been implemented to prevent any mice with the deletion from being used for experiments and no further data from these mice will be produced. The data from these mice will not be returned in any search results in the http://observatory.brain-map.org web application. Note that new analysis and images for the latest data release are not available for these failed data sets. The experiment data can still be viewed with a URL referencing the experiment id. Here is an example for experiment id 526787625:

http://observatory.brain-map.org/visualcoding/search/experiment?id=526787625

SDK users can choose to include this data in their analysis by including experiment_containers where the 'failed' attribute = TRUE. The affected animal records have been assigned the label "non Cre-specific phenotype".

Table 2. Previously released and subsequently failed specimens.

Mouse Id	Full Genotype	Specimen Notes	Experiment Container ID	Area	Depth (µm)
232269	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/Ai93-STOPdel	Epileptiform Events,Non Cre-specific Phenotype	511510632	VISal	375
			511510705	VISl	375
			511510635	VISp	375
			511510653	VISpm	375
232270	Rbp4-Cre_KL100/wt;Camk2a-tTA/wt;Ai93/Ai93-STOPdel	Epileptiform Events,Non Cre-specific Phenotype	511510770	VISal	375
			511510742	VISl	375
			511510974	VISp	375
243303	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93-STOPdel	Epileptiform Events,Non Cre-specific Phenotype	526787625	VISp	175
			540650206	VISp	250
			527683915	VISp	275
			528544341	VISp	375
252105	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93-STOPdel	Epileptiform Events,Non Cre-specific Phenotype	528694719	VISp	175
			529676887	VISp	275
			530688634	VISp	375
252106	Emx1-IRES-Cre/wt;Camk2a-tTA/wt;Ai93/Ai93-STOPdel	Epileptiform Events,Non Cre-specific Phenotype	530078243	VISp	175
			530738229	VISp	275
			528521086	VISp	375

REFERENCES

Steinmetz NA, Buetfering C, Lecoq J, Lee CR, Peters AJ, et al. 2017. Aberrant cortical activity in multiple GCaMP6-expressing transgenic mouse lines. *bioRxiv* 138511; doi: https://doi.org/10.1101/138511