

**Gene:** Lrguk

**Colony prefix:** DAJW

**Allele:** *Lrguk*<sup>em1(IMPC)Wtsi</sup>

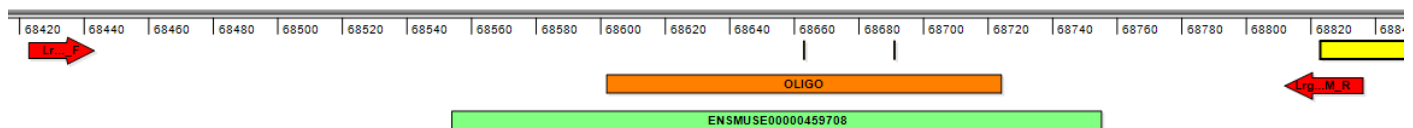
**Allele type:** Crispr/Cas9 mediated Point mutation

**Intended allele description:** R552H

**Allele information:**

Further information about the allele can be found on the 'International Mouse Phenotyping Consortium' (IMPC) web site at

<http://www.mousephenotype.org/data/alleles/MGI:1921604/em1%2528IMPC%2529Wtsi?>



**Mouse QC information**

<b>Loss of WT Allele (LOA) qPCR</b>	na	<b>Mutation Sequence confirmed</b>	pass
<b>Mutant Specific SR-PCR</b>	na	<b>Off-target analysis complete</b>	na

**Guide RNAs and mutant oligos used in initial experiment**

Sequence	Chr	Chr Start	Chr End
AATCGAAATTGCCGTCTCCA(GGG)	6	34092853	34092875
GTATTTCTGATTAACTTAACATAAAGGTCCA CTGGAGACG GCAATTTGATTTCTGCGTGACTGAACAATCCCTTTCTCCGCAA GTATCCCTCATATTTTCTTGCCATAGGCACCAC	6	34092785	34092907

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## Mutant allele sequence:

AAGTTTGAATATTCTTATTTTGAGCCTCGATATATCTTGGTGGTGCCTATGGACAAGGAAAAATATGAGGGATACTTGCGGAGA  
AAGGGATTGTTCAAGTC[G/A]CGCAGAAATCGAAATTGCCGTCTCCAG[G/A]GTGGACCTTTATGTTAAAGTTAATCAGAAATACC  
CAGGATATTTTATGATGCAGTAATCAATGCAGGTGAGTAATGCCAGAGTTTAATTATTTTTTATTTATGTTTTTCATG

## Genotyping by end-point PCR

### PCRs primer pairs and expected size bands

Assay Type	Assay	Forward Primer	Reverse Primer	Expected Size Band (bp)
Standard PCR	Screening*	Lrguk_PM_WT_F	Lrguk_PM_R	414

\*The screening PCR flanks the SNP region and can be used for sequence verification of the allele. The PCR will not distinguish wild type from mutant mice, however, as a product will be amplified in all cases.

**We recommend that mice are sequence-verified with the screening primers to confirm the genotyping qPCR results when establishing the colony, in case of any cross-talk between the assays.**

### Primer sequences

Primer Name	Primer Sequence (5' > 3')
Lrguk_PM_WT_F	GGAAAAGTAATCCAGCCTTGG
Lrguk_PM_R	CCCTGACTAATATAGCAGTGATTGT

### Reaction setup

Reagent	µl
DNA (~50-100 ng)	1
10x Buffer	2
MgCl <sub>2</sub> (50 mM)	0.6
Platinum Taq (Invitrogen)	0.2
dNTPs (100 mM)	0.2
Primer 1 (10 µM)	0.4
Primer 2 (10 µM)	0.4
ddH <sub>2</sub> O	15.2
Total	20

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### Amplification conditions

Step	Conditions	Time
1	94°C	5 min
2	94°C	30 sec
3	58°C	30 sec
4	72°C	1:30 sec
5	Go to '2' + 34 cycles	-
6	72°C	5 min
7	12°C	Forever

### Genotyping by SNP qPCR

#### Primers for LoA qPCR assay

Gene	Source	Forward Primer Seq.	Reverse Primer Seq.	Probe Primer Seq.
Lrguk_SNP	Life Technologies	GAGGGATACTTGC GGAGAA AGG	CTGGAGACGGCAATTCGAT	[VIC]TTGTTTCAGTCGCGCAGAA [FAM]ATTGTTTCAGTCACGCAGAA

Reactions are performed in a 10µl volume using an Applied Biosystems 7900HT Fast Real-Time PCR System or Applied Biosystems Vii7 with DNA prepared using the Sample-to-SNP™ kit (Applied Biosystems) from mouse ear biopsies. GTXpress™ buffer is also used (Applied Biosystems).

Reagent	µl
2x GTXpress™ buffer	5
40x target assay	0.25
ddH2O	3.75
DNA	1

### Amplification conditions

Step	Conditions	Time
Pre-read	60°C	30 sec
1	95°C	20 sec
2	95°C	10 sec
3	60°C	30 sec
4	Go to '2' + 34	-
Post-red	60°C	30 sec

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## Links to information and frequently asked questions

MGP mouse phenotype data:

<http://www.mousephenotype.org>

How the "critical" exon is decided:

<http://www.i-dcc.org/kb/entry/102/>

## Relevant publications

White, J.K., Gerdin, A.-K., Karp, N.A., Ryder, E., Buljan, M., Bussell, J.N., Salisbury, J., Clare, S., Ingham, N.J., Podrini, C., et al. (2013). Genome-wide Generation and Systematic Phenotyping of Knockout Mice Reveals New Roles for Many Genes. *Cell* 154, 452–464.

Mali P, Yang L, Esvelt KM, et al (2013) RNA-guided human genome engineering via Cas9. *Science* 339:823–6. doi: 10.1126/science.1232033

Jinek M, Chylinski K, Fonfara I, et al (2012) A programmable dual-RNA-guided DNA endonuclease in adaptive bacterial immunity. *Science* 337:816–21. doi: 10.1126/science.1225829

Cong L, Ran FA, Cox D, et al (2013) Multiplex genome engineering using CRISPR/Cas systems. *Science* 339:819–23. doi: 10.1126/science.1231143

Singh P, Schimenti JC, Bolcun-Filas E (2014) A Mouse Geneticist's Practical Guide to CRISPR Applications. *Genetics* genetics.114.169771–. doi: 10.1534/genetics.114.169771

Brandl C, Ortiz O, Röttig B, et al (2015) Creation of targeted genomic deletions using TALEN or CRISPR/Cas nuclease pairs in one-cell mouse embryos. *FEBS Open Bio* 5:26–35. doi: 10.1016/j.fob.2014.11.009

Zhou J, Wang J, Shen B, et al (2014) Dual sgRNAs facilitate CRISPR/Cas9 mediated mouse genome targeting. *FEBS J*. doi: 10.1111/febs.12735

Kraft K, Geuer S, Will AJ, et al (2015) Deletions, Inversions, Duplications: Engineering of Structural Variants using CRISPR/Cas in Mice. *Cell Rep*. doi: 10.1016/j.celrep.2015.01.016

Shen B, Zhang J, Wu H, et al (2013) Generation of gene-modified mice via Cas9/RNA-mediated gene targeting. *Cell Res* 23:720–3. doi: 10.1038/cr.2013.46

Wang H, Yang H, Shivalila CS, et al (2013) One-step generation of mice carrying mutations in multiple genes by CRISPR/Cas-mediated genome engineering. *Cell* 153:910–8. doi: 10.1016/j.cell.2013.04.025

Yang H, Wang H, Shivalila CS, et al (2013) One-Step Generation of Mice Carrying Reporter and Conditional Alleles by CRISPR/Cas-Mediated Genome Engineering. *Cell* 154:1370–1379. doi: 10.1016/j.cell.2013.08.022

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