Abl1 Cas9-KO Strategy

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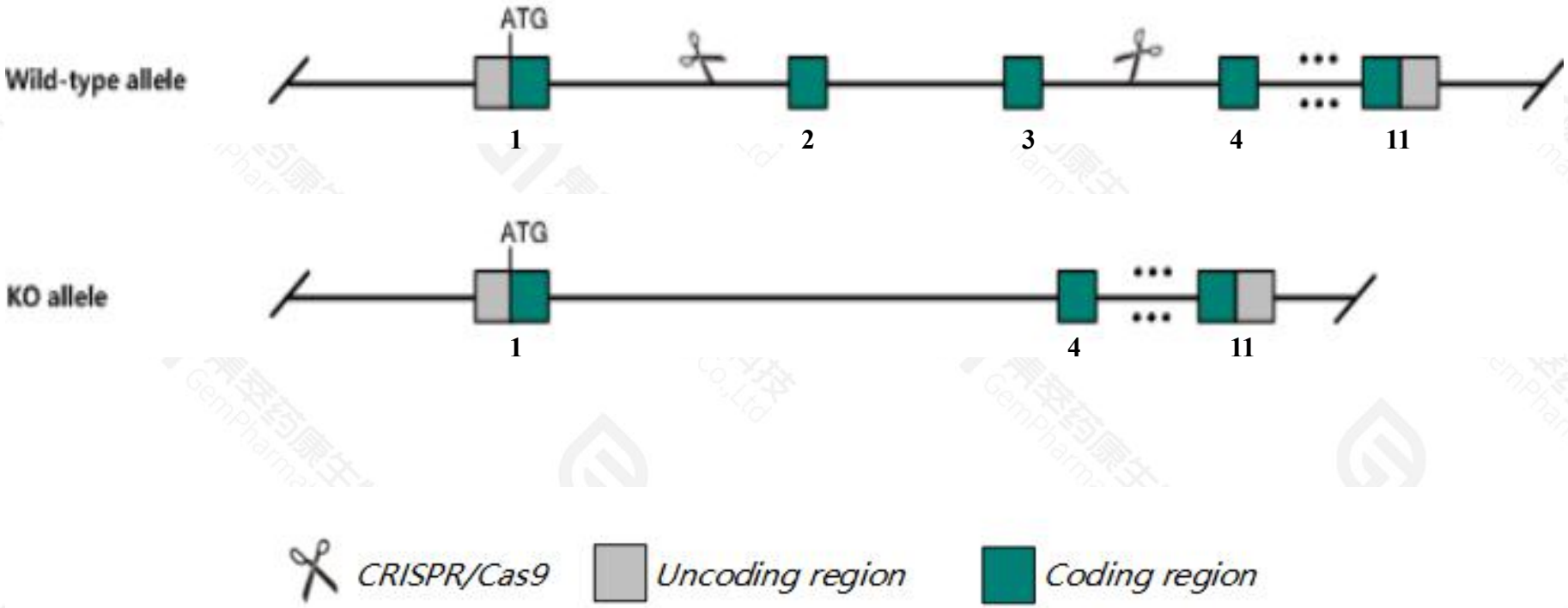
Design Date: 2021-7-26

Project Overview

Project Name	***Abl1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Abl1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Abl1* gene has 10 transcripts. According to the structure of *Abl1* gene, exon2-exon3 of *Abl1-202*(ENSMUST00000075759.13) transcript is recommended as the knockout region.The region contains 470bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Abl1* gene. The brief process is as follows: CRISPR/Cas9 system were microinjected into the fertilized eggs of C57BL/6JGpt mice. Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.

Notice

➢ According to the existing MGI data,mice homozygous for targeted mutations that inactivate the gene have increased perinatal and postnatal mortality and may display foreshortened crania, abnormal development of spleen, head, heart and eye, reduced B and T cell populations, and osteoporosis.

➢ The *Abl1* gene is located on the Chr2. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.

➢ This strategy is designed based on genetic information in existing databases.Due to the complexity of biological processes,all risk of the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

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Abl1 c-abl oncogene 1, non-receptor tyrosine kinase [Mus musculus (house mouse)]

Gene ID: 11350, updated on 13-Mar-2020

Summary

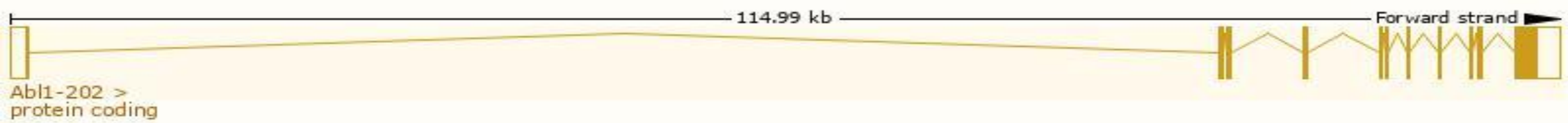
Official Symbol	Abl1 provided by MGI
Official Full Name	c-abl oncogene 1, non-receptor tyrosine kinase provided by MGI
Primary source	MGI:MGI:87859
See related	Ensembl:ENSMUSG00000026842
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI325092, Abl, E430008G22Rik, c-Abl
Expression	Ubiquitous expression in ovary adult (RPKM 24.4), limb E14.5 (RPKM 24.2) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

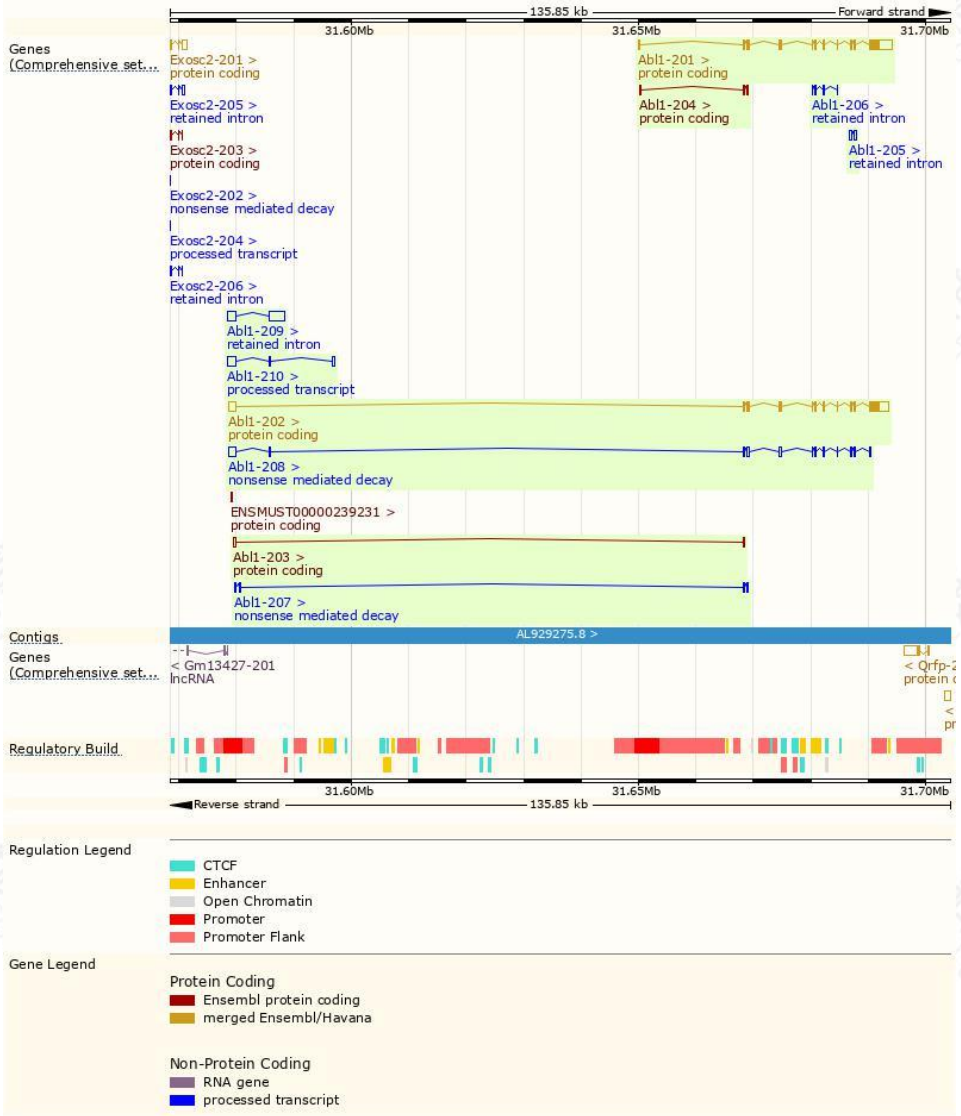
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Abl1-202	ENSMUST00000075759.12	6327	1142aa	Protein coding	CCDS50563	P00520 Q3SYK5	TSL:1 GENCODE basic APPRIS ALT2
Abl1-201	ENSMUST00000028190.12	5794	1123aa	Protein coding	CCDS15901	P00520	TSL:1 GENCODE basic APPRIS P3
Abl1-204	ENSMUST00000124089.1	561	114aa	Protein coding	-	A2AV23	CDS 3' incomplete TSL:1
Abl1-203	ENSMUST00000123471.1	534	64aa	Protein coding	-	A0A0A6YY65	CDS 3' incomplete TSL:5
Abl1-208	ENSMUST00000142554.7	3268	78aa	Nonsense mediated decay	-	A0A0A6YXS9	TSL:1
Abl1-207	ENSMUST00000135233.2	815	71aa	Nonsense mediated decay	-	A0A0A6YVY6	TSL:1
Abl1-210	ENSMUST00000156736.3	2017	No protein	Processed transcript	-	-	TSL:1
Abl1-209	ENSMUST00000146537.1	4155	No protein	Retained intron	-	-	TSL:1
Abl1-205	ENSMUST00000124726.1	847	No protein	Retained intron	-	-	TSL:3
Abl1-206	ENSMUST00000127714.1	577	No protein	Retained intron	-	-	TSL:5

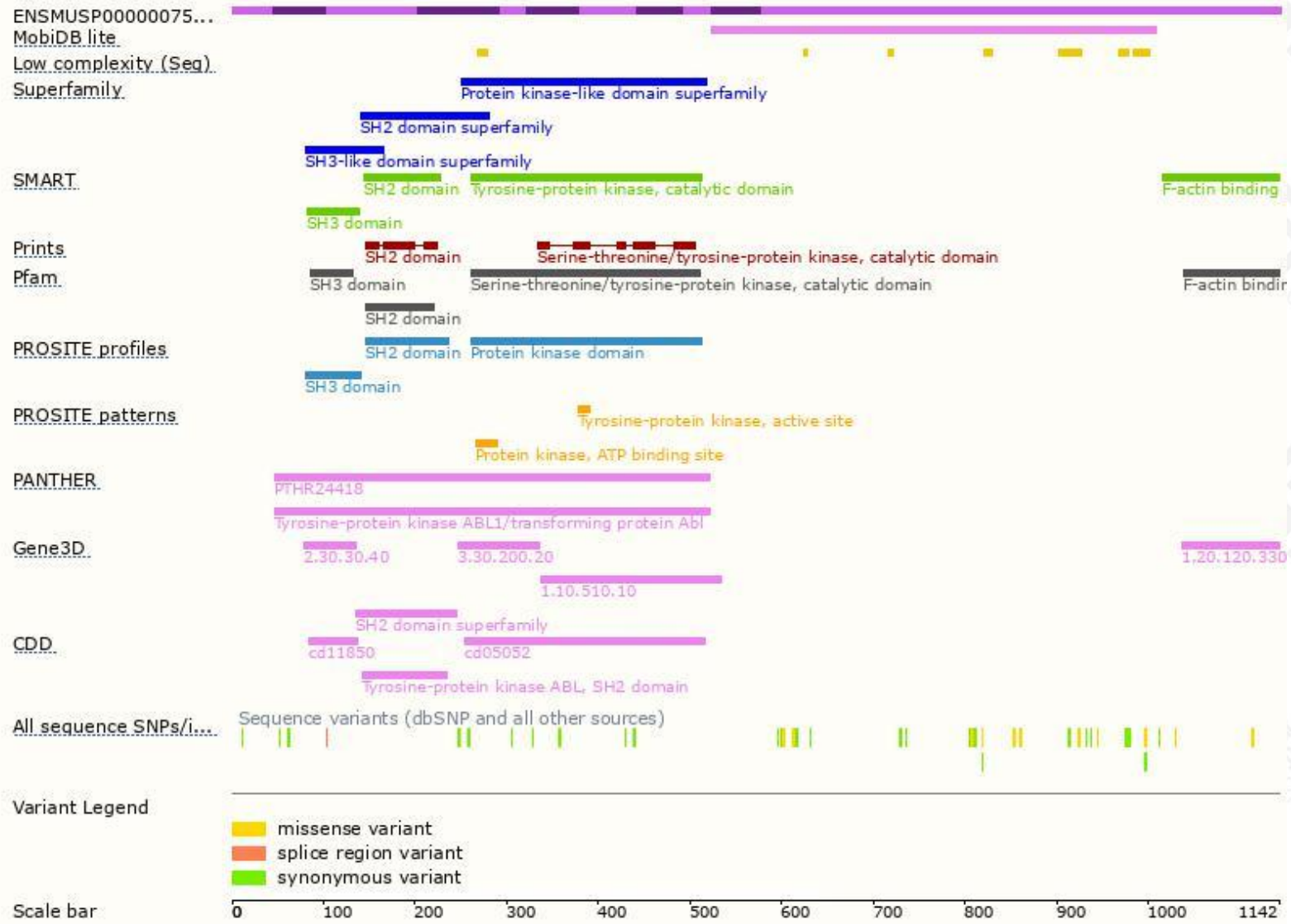
The strategy is based on the design of *Abl1-202* transcript,the transcription is shown below:



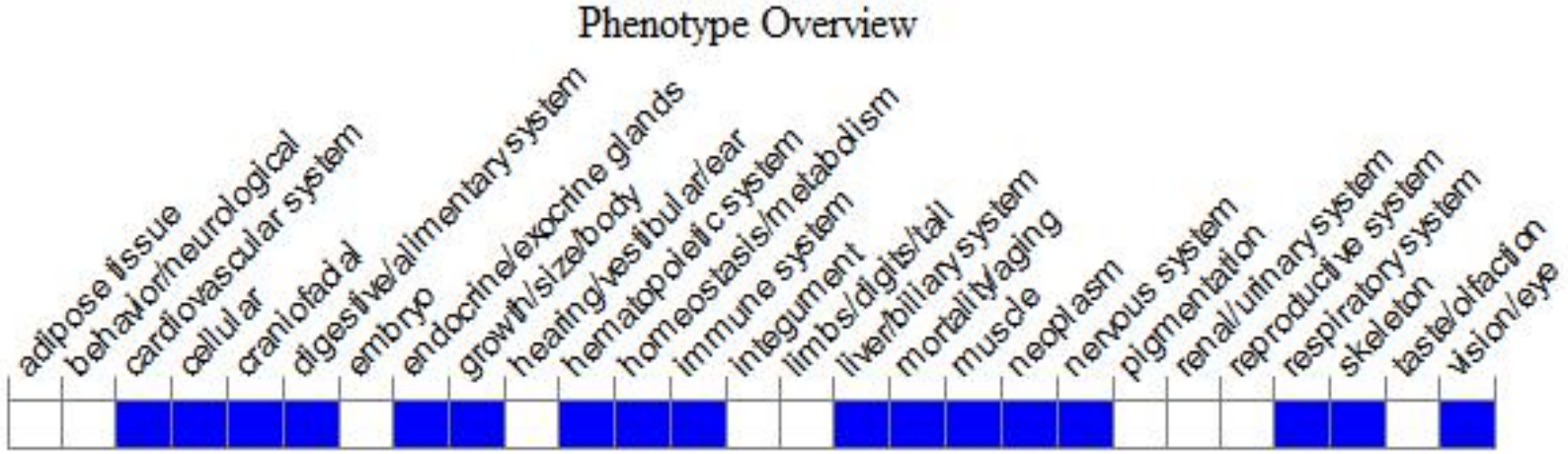
Genomic location distribution



Protein domain



Mouse phenotype description(MGI)



Phenotypes affected by the gene are marked in blue.Data quoted from MGI database(http://www.informatics.jax.org/).

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If you have any questions, you are welcome to inquire.
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