Hint1 Cas9-CKO Strategy

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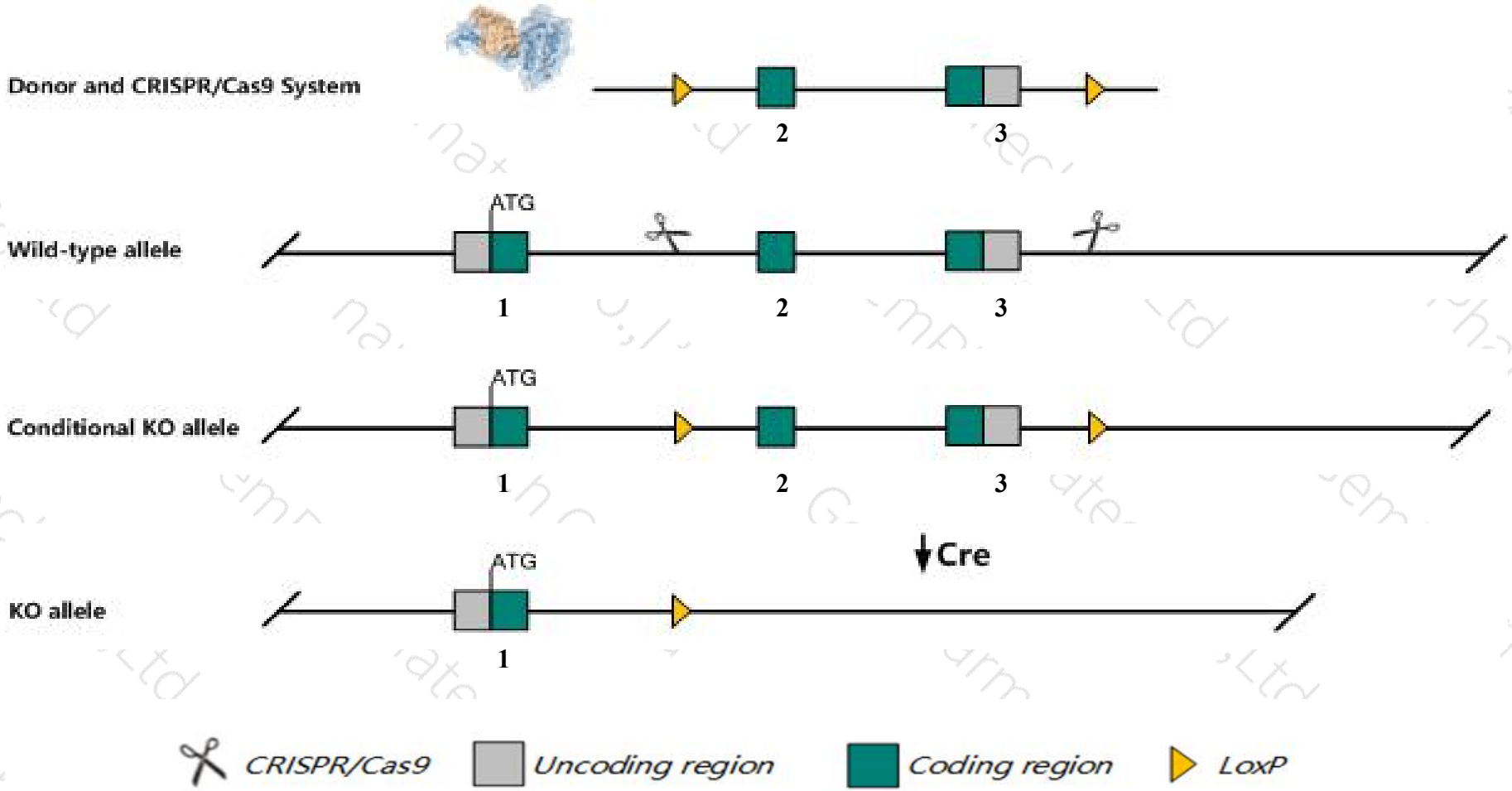
Project Overview

Project Name	***Hint1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hint1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Hint1* gene has 2 transcripts. According to the structure of *Hint1* gene, exon2-exon3 of *Hint1-201*(ENSMUST00000020504.5) transcript is recommended as the knockout region.The region contains most of the coding sequence.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Hint1* gene. The brief process is as follows:CRISPR/Cas9 system and Donor 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.

➢ The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Notice

➢ According to the existing MGI data,homozygous mutant animals do not exhibit an overt phenotype, though one line of mutant mice was shown to be more susceptible to carcinogen-induced tumors than wild-type.

➢ The *Hint1* gene is located on the Chr11. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

集萃药康 GemPharmatech

Hint1 histidine triad nucleotide binding protein 1 [Mus musculus (house mouse)]

Gene ID: 15254, updated on 13-Mar-2020

Summary

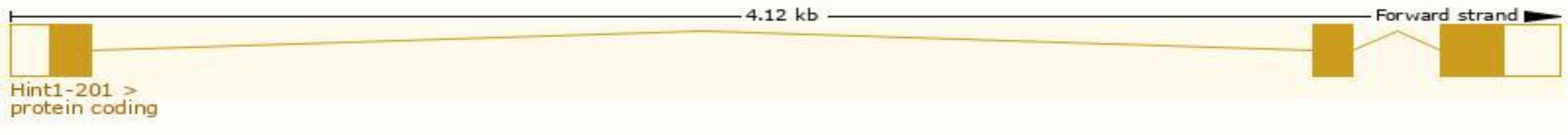
Official Symbol	Hint1 provided by MGI
Official Full Name	histidine triad nucleotide binding protein 1 provided by MGI
Primary source	MGI:MGI:1321133
See related	Ensembl:ENSMUSG00000020267
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA673479, Hint, Ipk1, PKCI-1, PRKCNH1
Expression	Ubiquitous expression in kidney adult (RPKM 346.0), duodenum adult (RPKM 283.7) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

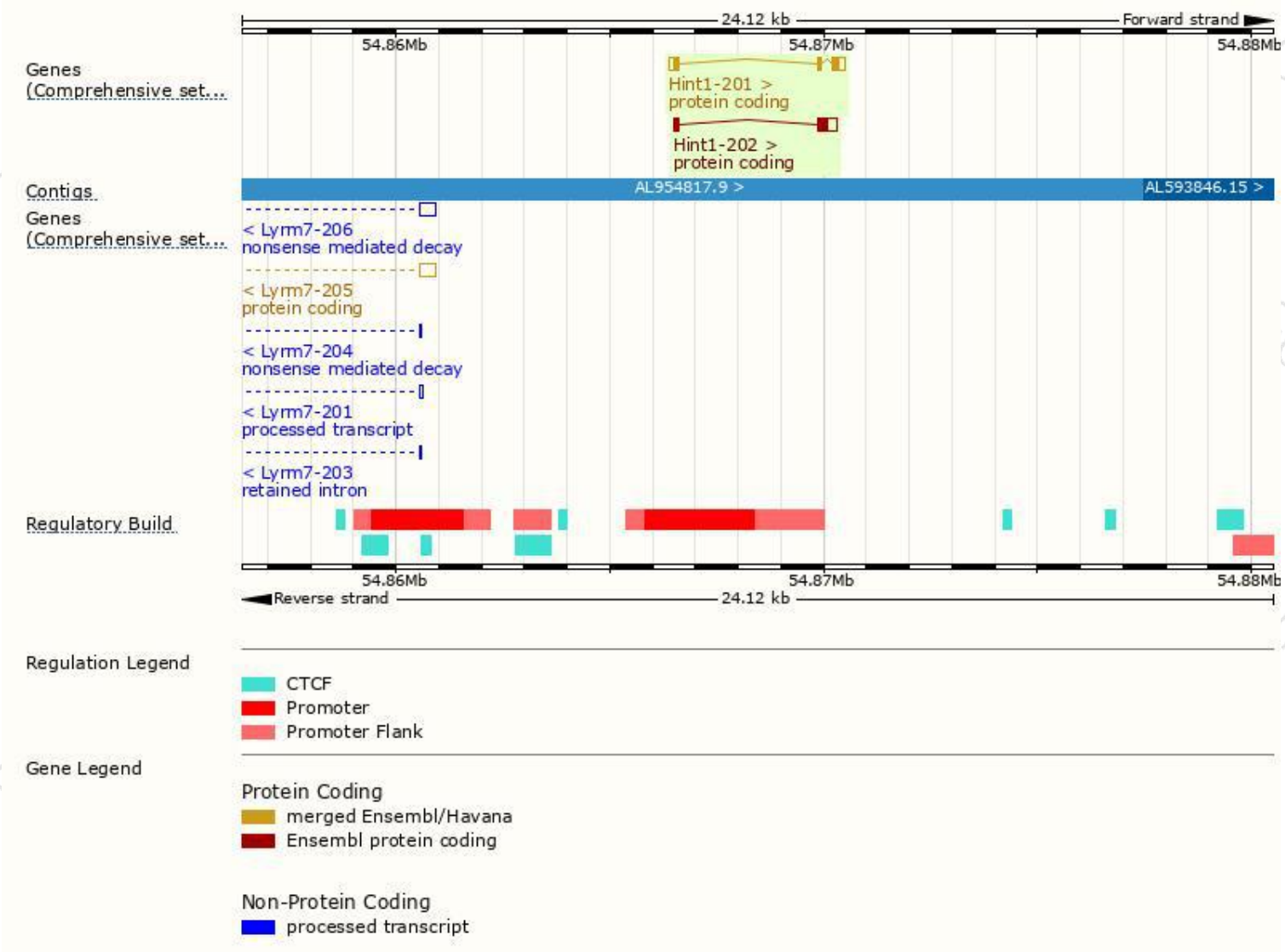
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hint1-201	ENSMUST00000020504.5	636	126aa	Protein coding	CCDS24702	P70349	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Hint1-202	ENSMUST00000117710.1	580	119aa	Protein coding	-	B0R1E3	TSL:2 GENCODE basic

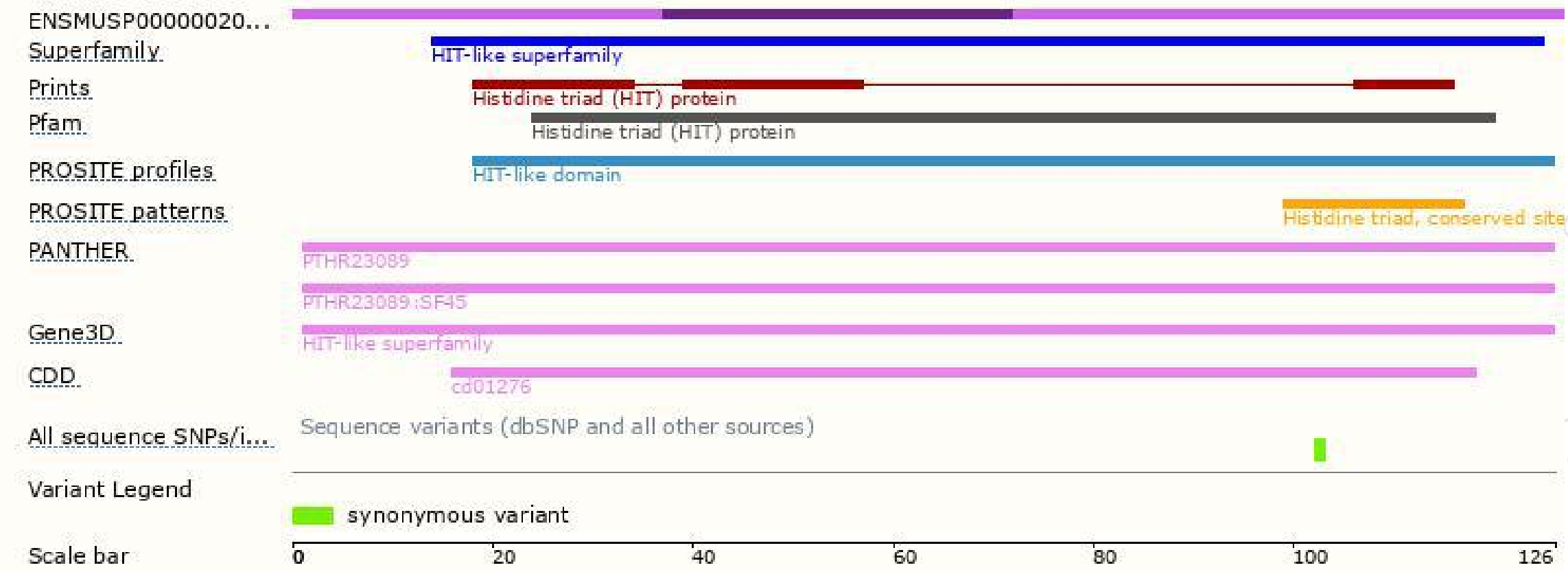
The strategy is based on the design of *Hint1-201* transcript,the transcription is shown below:



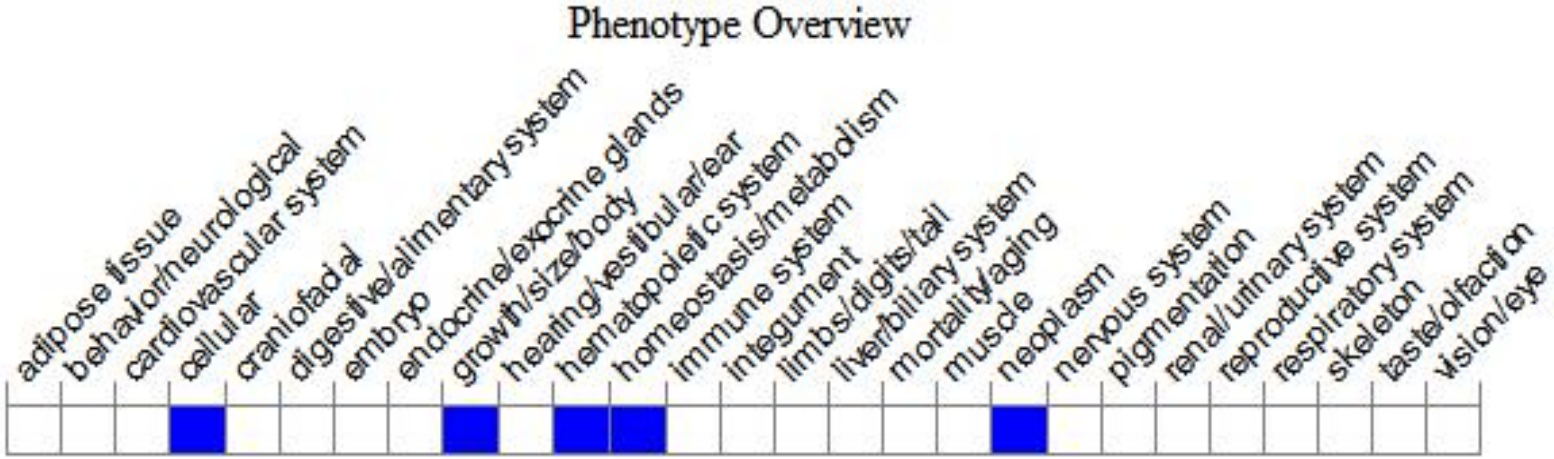
Genomic location distribution



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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