

Hexb Cas9-KO Strategy

Designer:

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Project Overview



Project Name

Hexb

Project type

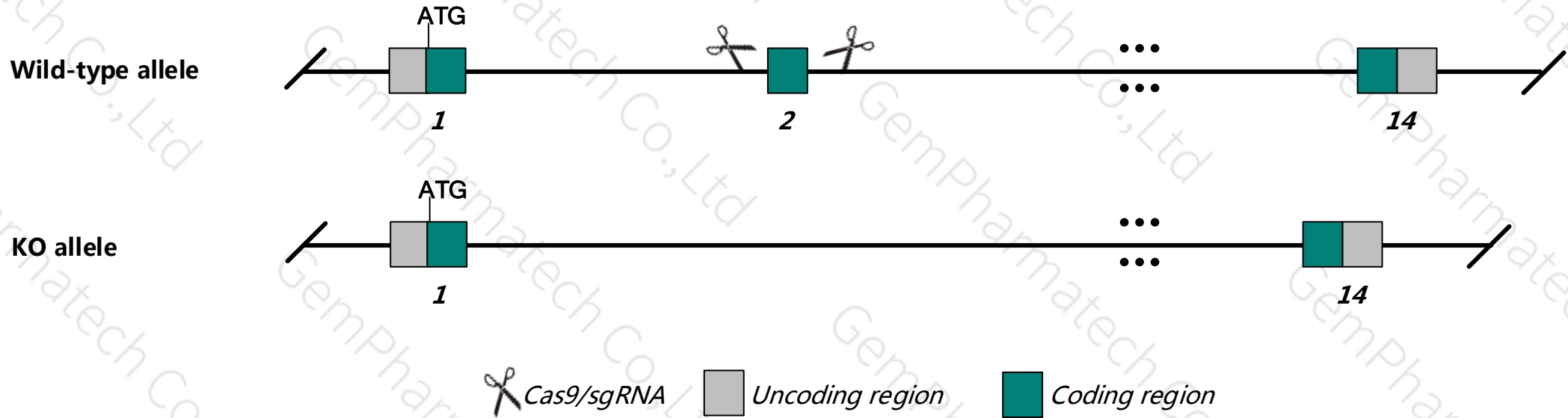
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



Technical routes

- The *Hexb* gene has 2 transcripts. According to the structure of *Hexb* gene, exon2 of *Hexb*-201 (*ENSMUST00000022169.9*) transcript is recommended as the knockout region. The region contains 146bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hexb* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data , Homozygous mutants exhibit spasticity, muscle weakness, rigidity, tremors, and ataxia beginning around 4 months of age and resulting in death about 6 weeks later. Mutants accumulate GM2 ganglioside and glycolipid GA2 in brain.
- The *Hexb* gene is located on the Chr13. 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, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)



Hexb hexosaminidase B [*Mus musculus* (house mouse)]

Gene ID: 15212, updated on 31-Jan-2019

Summary

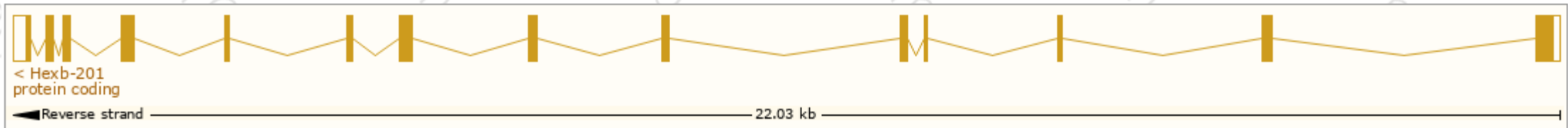
Official Symbol	Hexb provided by MGI
Official Full Name	hexosaminidase B provided by MGI
Primary source	MGI:MGI:96074
See related	Ensembl:ENSMUSG00000021665
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Ubiquitous expression in colon adult (RPKM 103.1), genital fat pad adult (RPKM 82.6) and 27 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

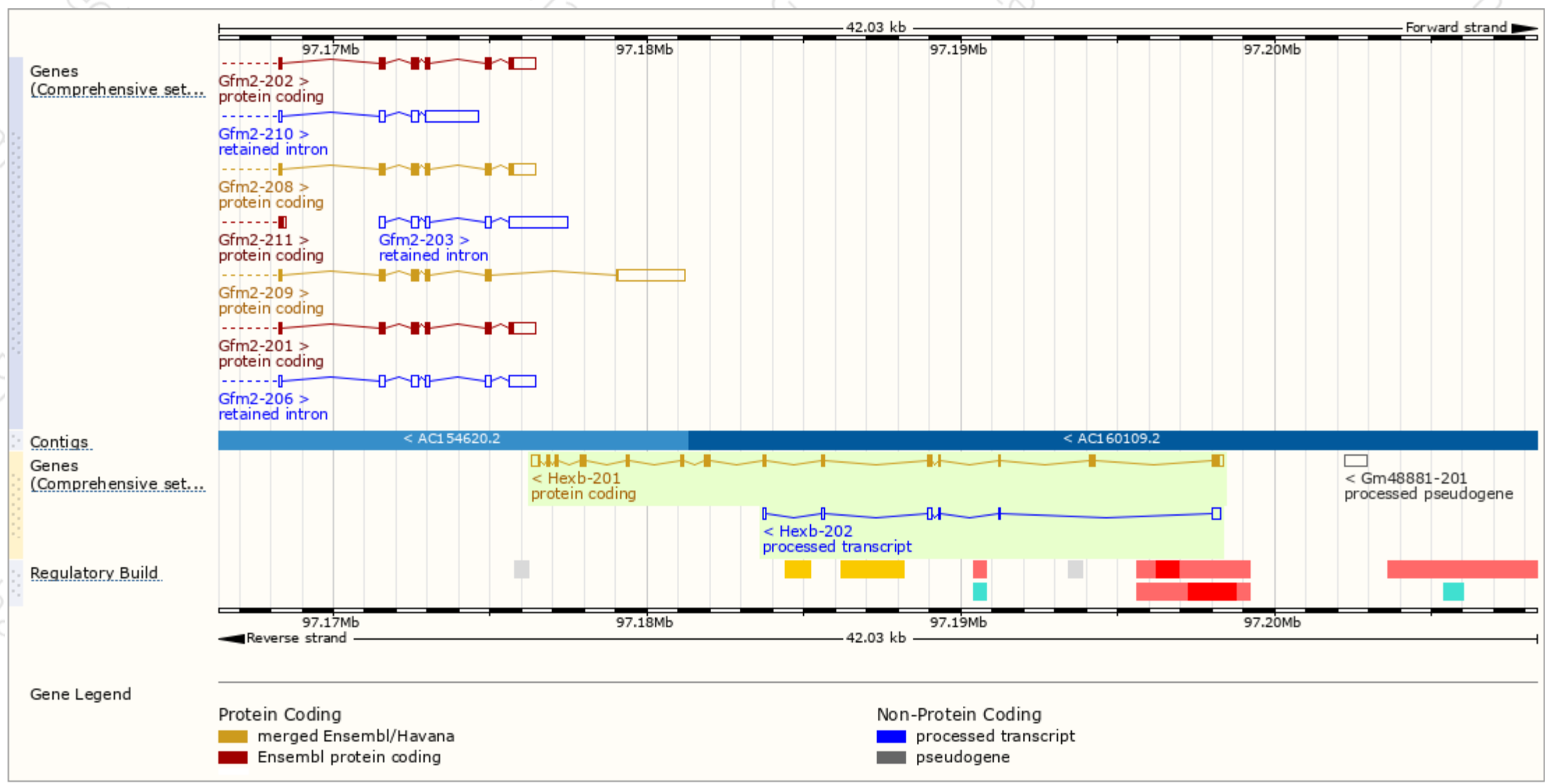
The gene has 2 transcripts, and all transcripts are shown below:

Show/hide columns (1 hidden)		Filter					
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hexb-201	ENSMUST0000022169.9	1905	536aa	Protein coding	CCDS26709	P20060 Q3TXR9	TSL:1 GENCODE basic APPRIS P1
Hexb-202	ENSMUST00000222700.1	727	No protein	Processed transcript	-	-	TSL:3

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



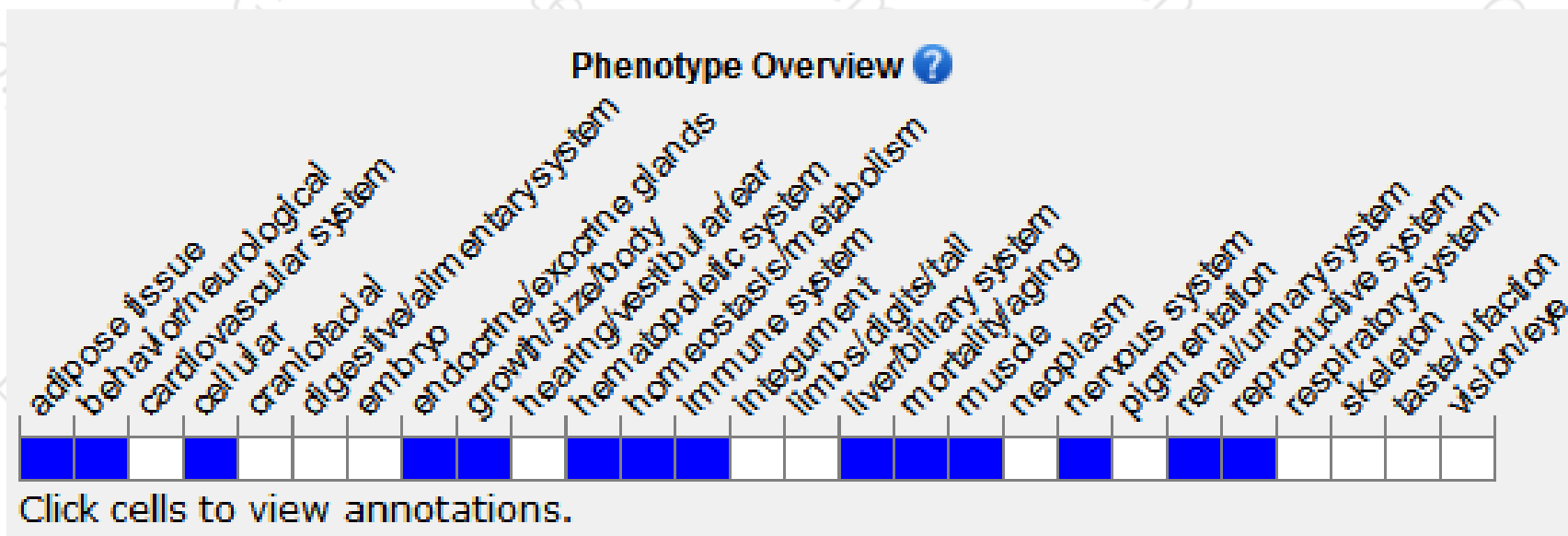
Genomic location distribution



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/>).

According to the existing MGI data, Homozygous mutants exhibit spasticity, muscle weakness, rigidity, tremors, and ataxia beginning around 4 months of age and resulting in death about 6 weeks later. Mutants accumulate GM2 ganglioside and glycolipid GA2 in brain.

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