Hydin Cas9-CKO *Strategy*

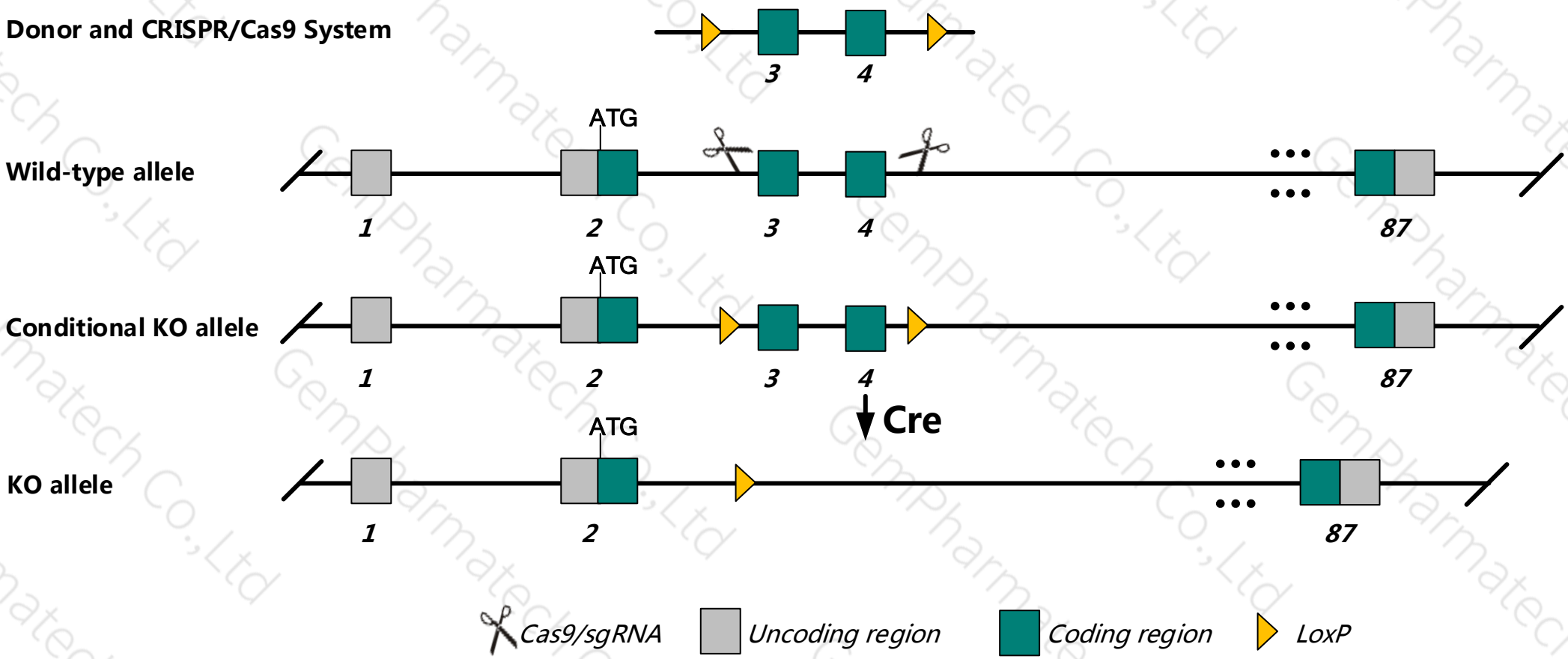
Designer: **Daohua Xu**

Project Overview

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

Conditional Knockout strategy

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



Technical routes

- The *Hydin* gene has 3 transcripts.According to the structure of *Hydin* gene, exon3-exon4 of *Hydin*-201 (ENSMUST00000043141.6) transcript is recommended as the knockout region.The region contains 284bp coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Hydin* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed.Cas9, sgRNA 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 was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

Notice

- According to the existing MGI data，Mice homozygous for a mutation in this gene develop hydrocephaly after birth. Symptoms develop after 3-5 days. Affected animals usually die before 2 months of age.
- The *Hydin* gene is located on the Chr8. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

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Hydin HYDIN, axonemal central pair apparatus protein [*Mus musculus* (house mouse)]

Gene ID: 244653, updated on 2-Apr-2019

Summary

Official Symbol	Hydin provided by MGI
Official Full Name	HYDIN, axonemal central pair apparatus protein provided by MGI
Primary source	MGI:MGI:2389007
See related	Ensembl:ENSMUSG00000059854
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	hy3; hy-3; hyrh; 672398; Gm9558; 4932703P14; A830061H17; 1700034M11Rik; 4930545D19Rik; AC069308.21gm4
Expression	Biased expression in testis adult (RPKM 10.5), lung adult (RPKM 1.1) and 1 other tissue See more
Orthologs	human all

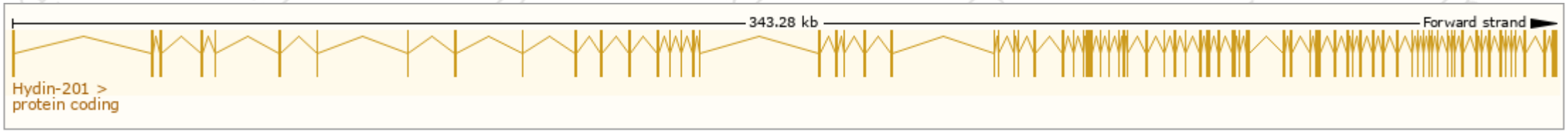
Transcript information（Ensembl）

The gene has 3 transcripts, and all transcripts are shown below:

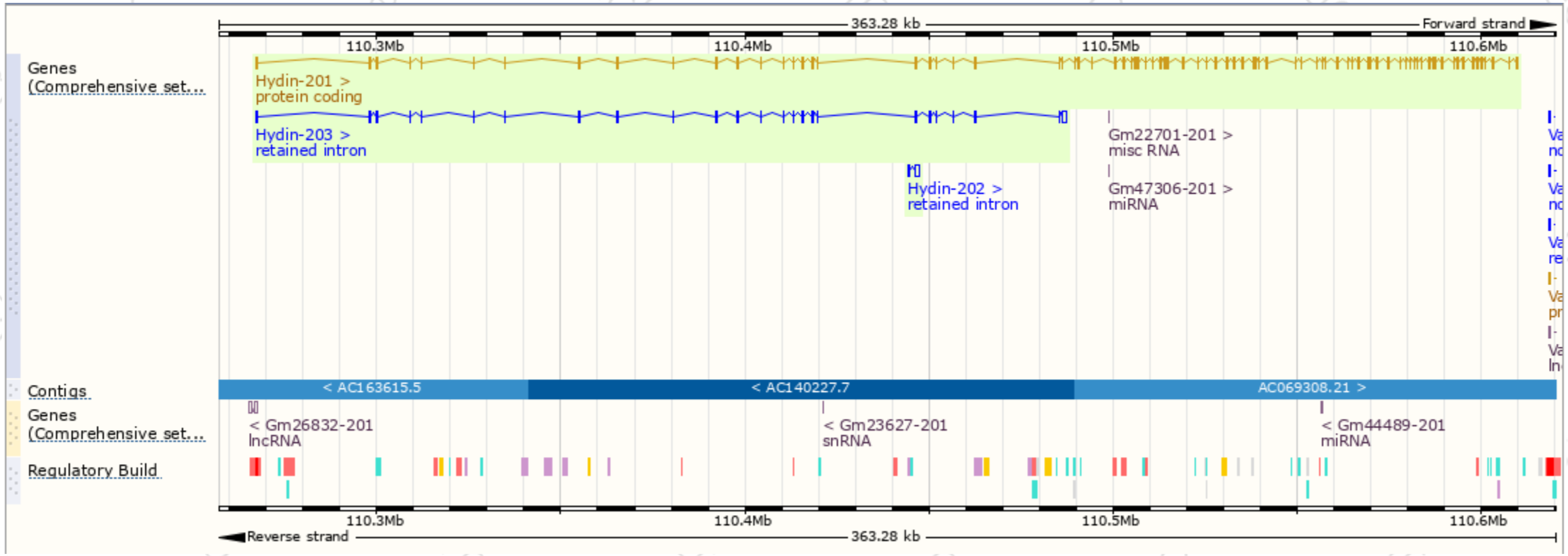
Show/hide columns (1 hidden) Filter

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hydin-201	ENSMUST00000043141.6	15783	5154aa	Protein coding	CCDS40476	Q80W93	TSL:1 GENCODE basic APPRIS P1
Hydin-203	ENSMUST00000212218.1	5330	No protein	Retained intron	-	-	TSL:1
Hydin-202	ENSMUST00000212034.1	1267	No protein	Retained intron	-	-	TSL:1

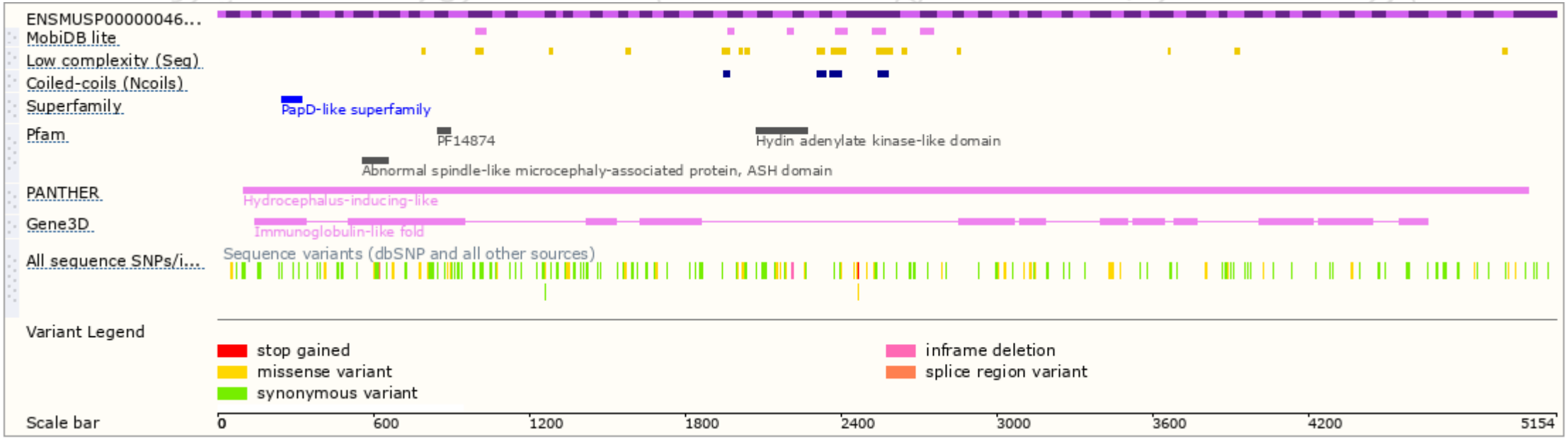
The strategy is based on the design of *Hydin*-201 transcript,The transcription is shown below



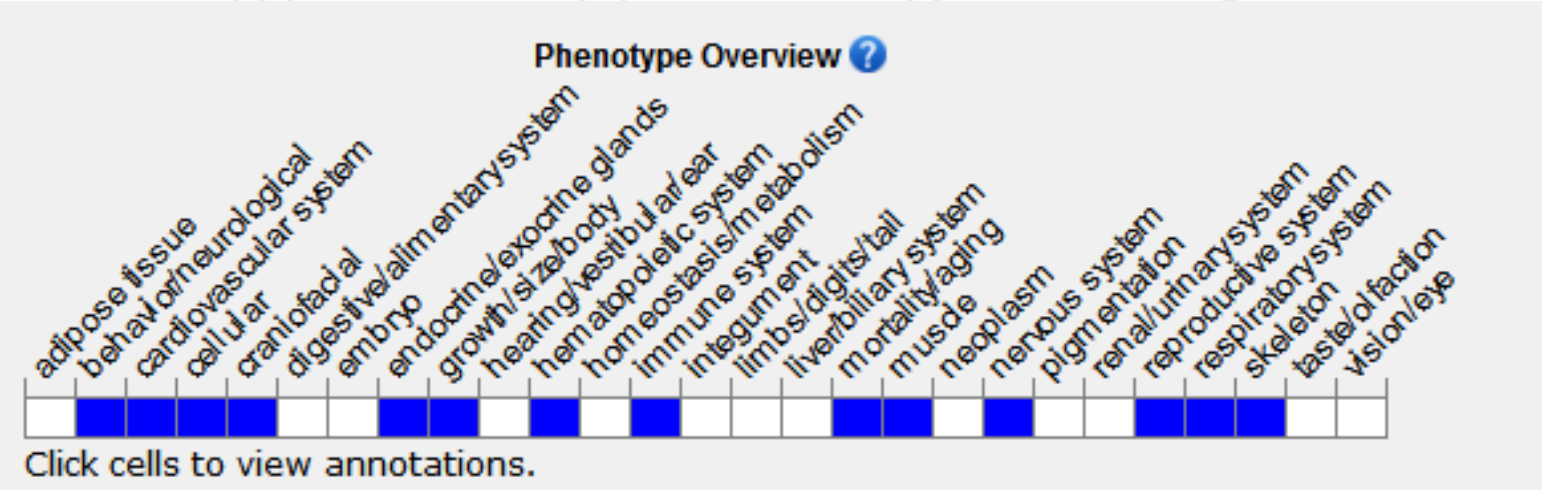
Genomic location distribution



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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