Astn1 Cas9-CKO Strategy

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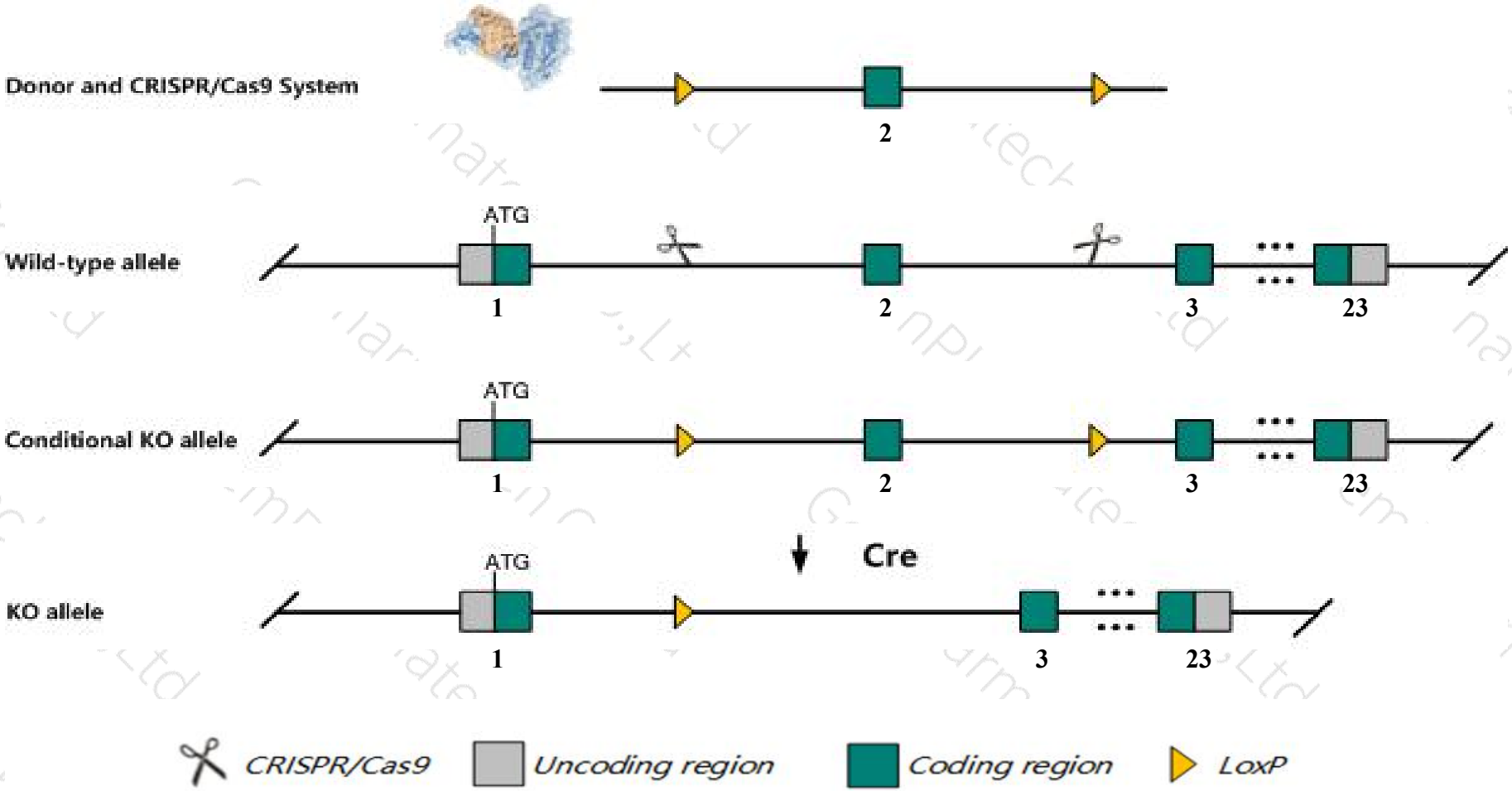
Project Overview

Project Name	***Astn1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Astn1* gene. The schematic diagram is as follows:



Technical routes

- The *Astn1* gene has 11 transcripts. According to the structure of *Astn1* gene, exon2 of *Astn1-205* (ENSMUST00000193042.5) transcript is recommended as the knockout region.The region contains 188bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Astn1* 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 mutation of this gene results in reduced cerebellum size, abnormal Purkinje cell morphology, and reduced coordination performance on the Rotarod test.

➢ Transcript 204 CDS 5' incomplete the influences is unknown.

➢Transcripts 206 maybe unaffected.

➢ The *Astn1* gene is located on the Chr1. 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）

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Astn1 astrotactin 1 [Mus musculus (house mouse)]

Gene ID: 11899, updated on 31-Jan-2019

Summary

Official Symbol	Astn1 provided by MGI
Official Full Name	astrotactin 1 provided by MGI
Primary source	MGI:MGI:1098567
See related	Ensembl:ENSMUSG00000026587
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	Astn, GC14, mKIAA0289
Expression	Biased expression in frontal lobe adult (RPKM 19.5), cortex adult (RPKM 15.6) and 6 other tissues See more
Orthologs	human all

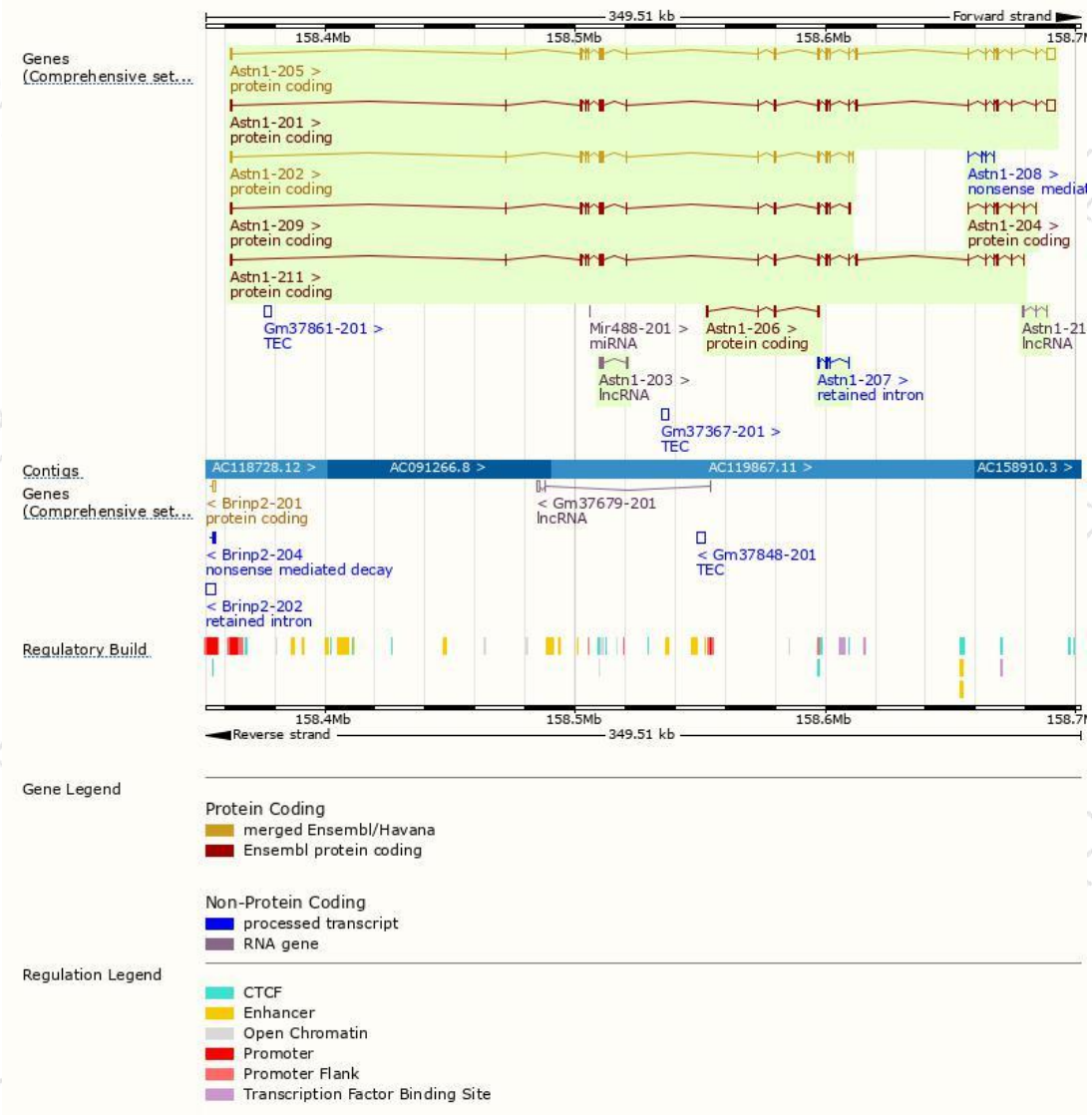
Transcript information（Ensembl）

The gene has 11 transcripts,all transcripts are shown below:

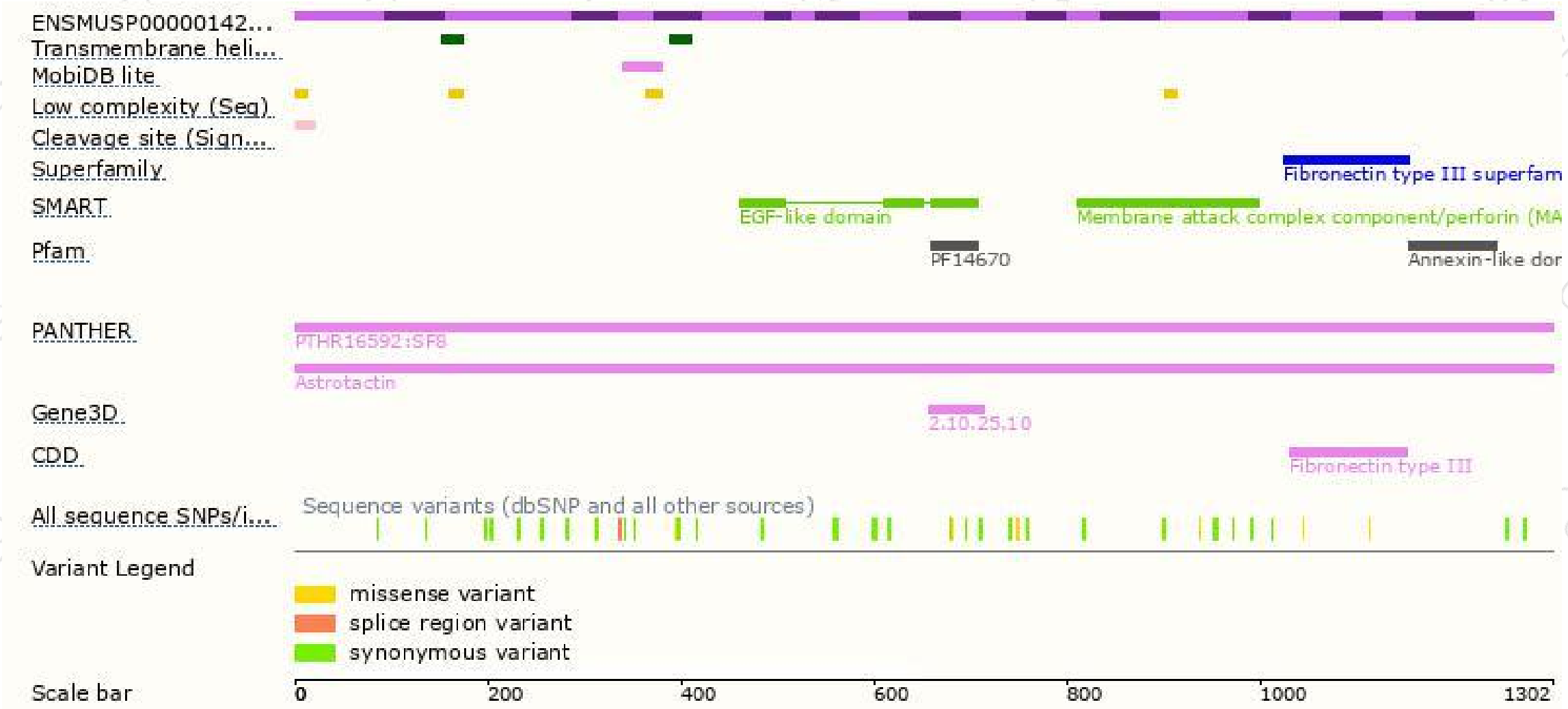
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Astn1-205	ENSMUST00000193042.5	7248	1302aa	Protein coding	CCDS56648	Q61137	TSL:1 GENCODE basic
Astn1-201	ENSMUST00000046110.15	7195	1294aa	Protein coding	CCDS78721	Q3UHD7 Q61137	TSL:1 GENCODE basic APPRIS P1
Astn1-211	ENSMUST00000195311.5	3642	1172aa	Protein coding	-	A0A0A6YWE6	TSL:1 GENCODE basic
Astn1-209	ENSMUST00000194369.5	3344	893aa	Protein coding	-	A0A0A6YXJ4	TSL:1 GENCODE basic
Astn1-202	ENSMUST00000170718.6	2927	840aa	Protein coding	-	Q3TPU9	TSL:1 GENCODE basic
Astn1-204	ENSMUST00000192821.1	756	236aa	Protein coding	-	A0A0A6YVT7	CDS 5' incomplete TSL:5
Astn1-206	ENSMUST00000193599.1	719	150aa	Protein coding	-	A0A0A6YWD1	CDS 3' incomplete TSL:3
Astn1-208	ENSMUST00000194217.1	508	76aa	Nonsense mediated decay	-	A0A0A6YWJ9	CDS 5' incomplete TSL:3
Astn1-207	ENSMUST00000194041.1	760	No protein	Retained intron	-	-	TSL:3
Astn1-210	ENSMUST00000194658.1	808	No protein	lncRNA	-	-	TSL:5
Astn1-203	ENSMUST00000192619.1	680	No protein	lncRNA	-	-	TSL:3

The strategy is based on the design of *Astn1-205* transcript,The transcription is shown below

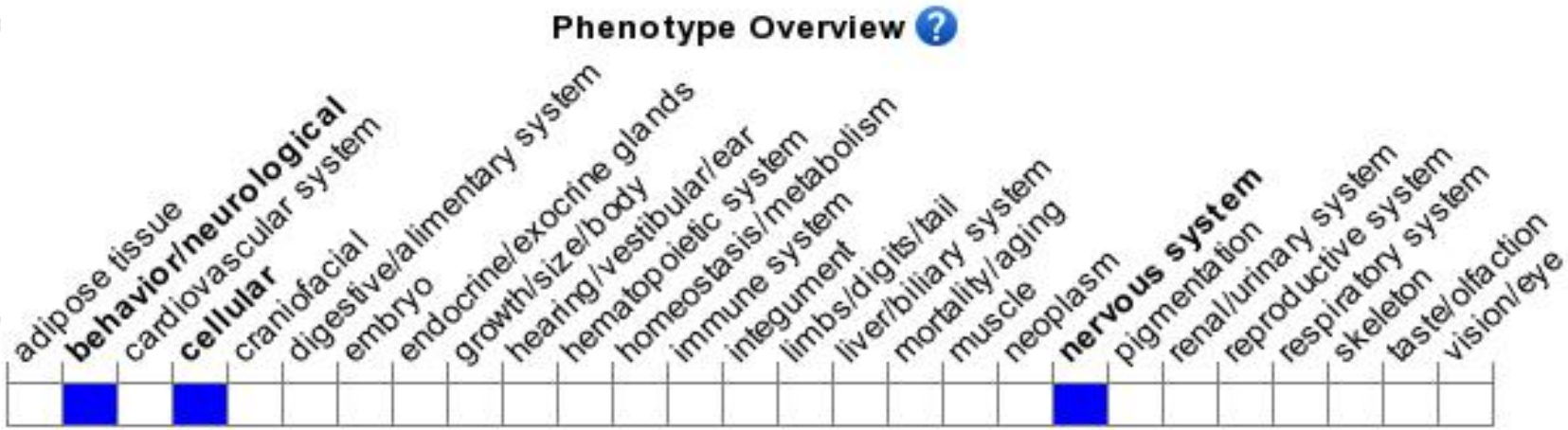
Genomic location distribution



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 mutation of this gene results in reduced cerebellum size, abnormal Purkinje cell morphology, and reduced coordination performance on the Rotarod test.

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

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