Avp Cas9-CKO Strategy

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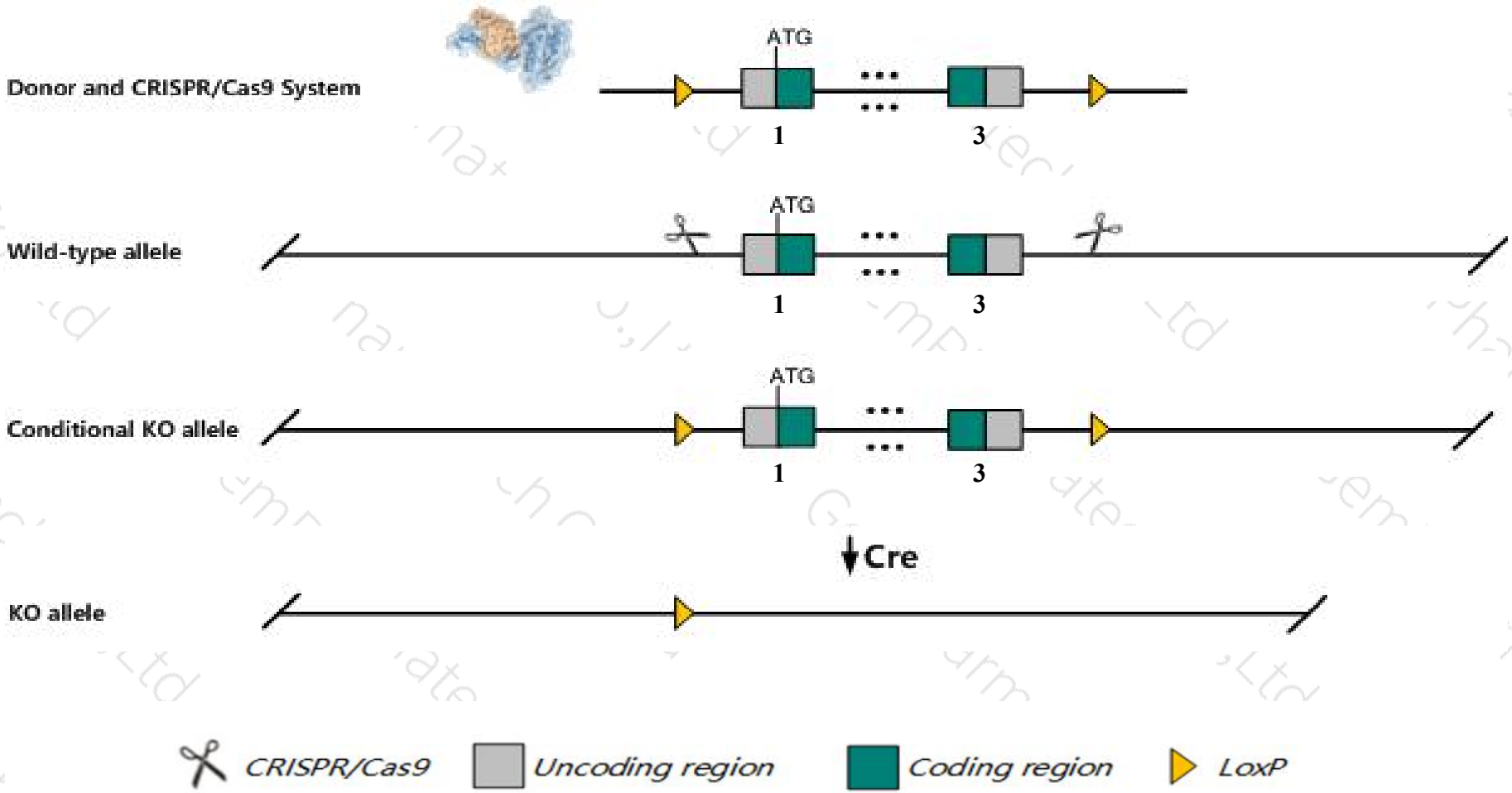
Project Overview

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

Conditional Knockout strategy

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



Technical routes

➢ The *Avp* gene has 1 transcript. According to the structure of *Avp* gene, exon1-exon3 of *Avp-201*(ENSMUST00000046001.6) transcript is recommended as the knockout region.The region contains all 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 *Avp* 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,mice homozygous for a premature stop mutation display postnatal lethality. Heterozygous mice display polyuria, increased water intake, decreased urine osmolality, and hypothalamic abnormalities.

➢ The *Avp* 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 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

Avp arginine vasopressin [Mus musculus (house mouse)]

Gene ID: 11998, updated on 13-Mar-2020

Summary

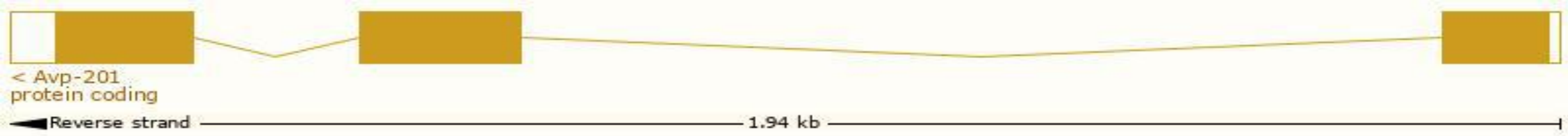
Official Symbol	Avp provided by MGI
Official Full Name	arginine vasopressin provided byMGI
Primary source	MGI:MGI:88121
See related	Ensembl:ENSMUSG00000037727
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Vp, Vsp
Summary	This gene encodes a member of the vasopressin/oxytocin family and preproprotein that is proteolytically processed to generate multiple protein products. These products include the neuropeptide hormone arginine vasopressin, and two other peptides, neurophysin 2 and copeptin. Arginine vasopressin binds to vasopressin receptors and functions as a vasopressor, to constrict blood vessels and increase blood pressure, and as an antidiuretic, to reduce the production of urine. Neurophysin 2 functions as a carrier protein in the transport of arginine vasopressin. This gene is present in a gene cluster with the related gene oxytocin on chromosome 2. [provided by RefSeq, Aug 2015]
Expression	Biased expression in CNS E18 (RPKM 15.5), whole brain E14.5 (RPKM 1.7) and 1 other tissueSee more
Orthologs	human all

Transcript information（Ensembl）

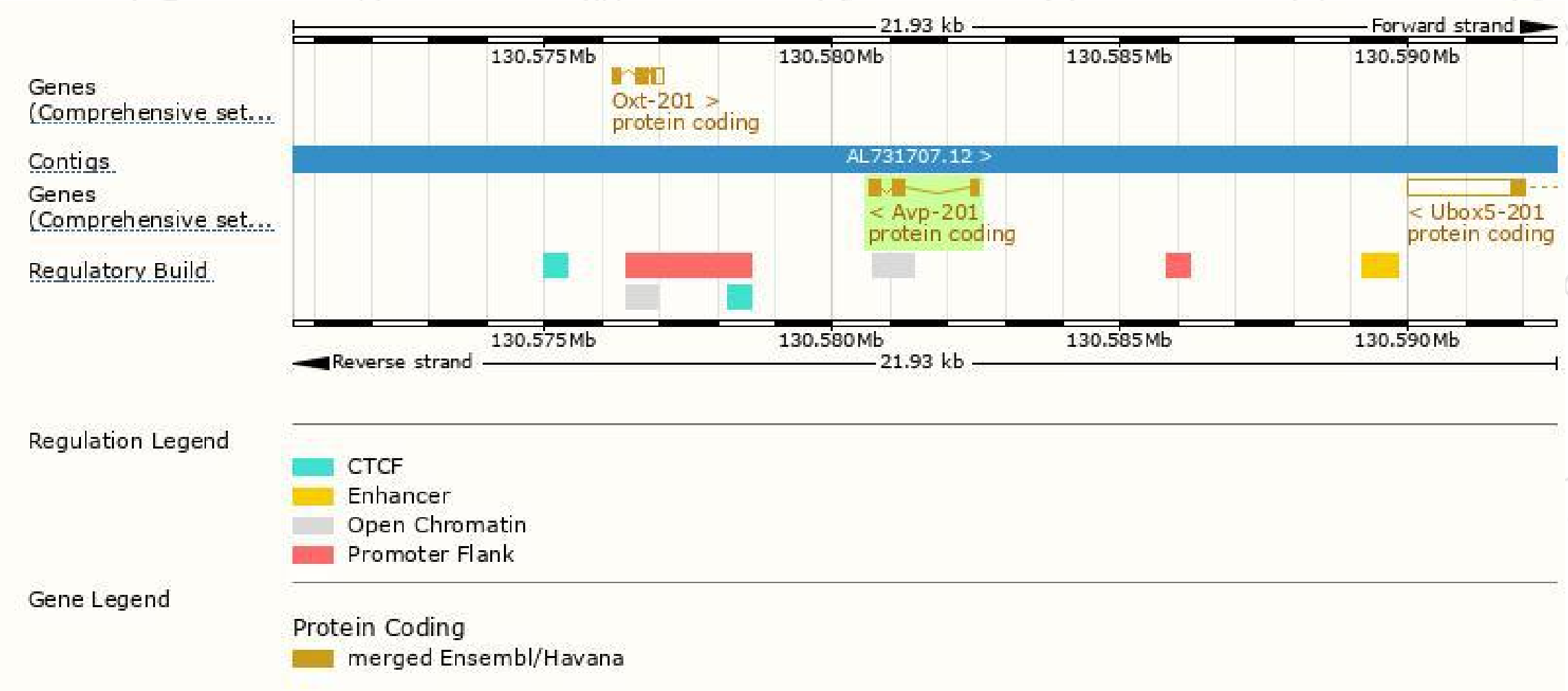
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Avp-201	ENSMUST00000046001.6	577	168aa	Protein coding	CCDS16746	P35455 Q3UUQ5	TSL:1 GENCODE basic APPRIS P1

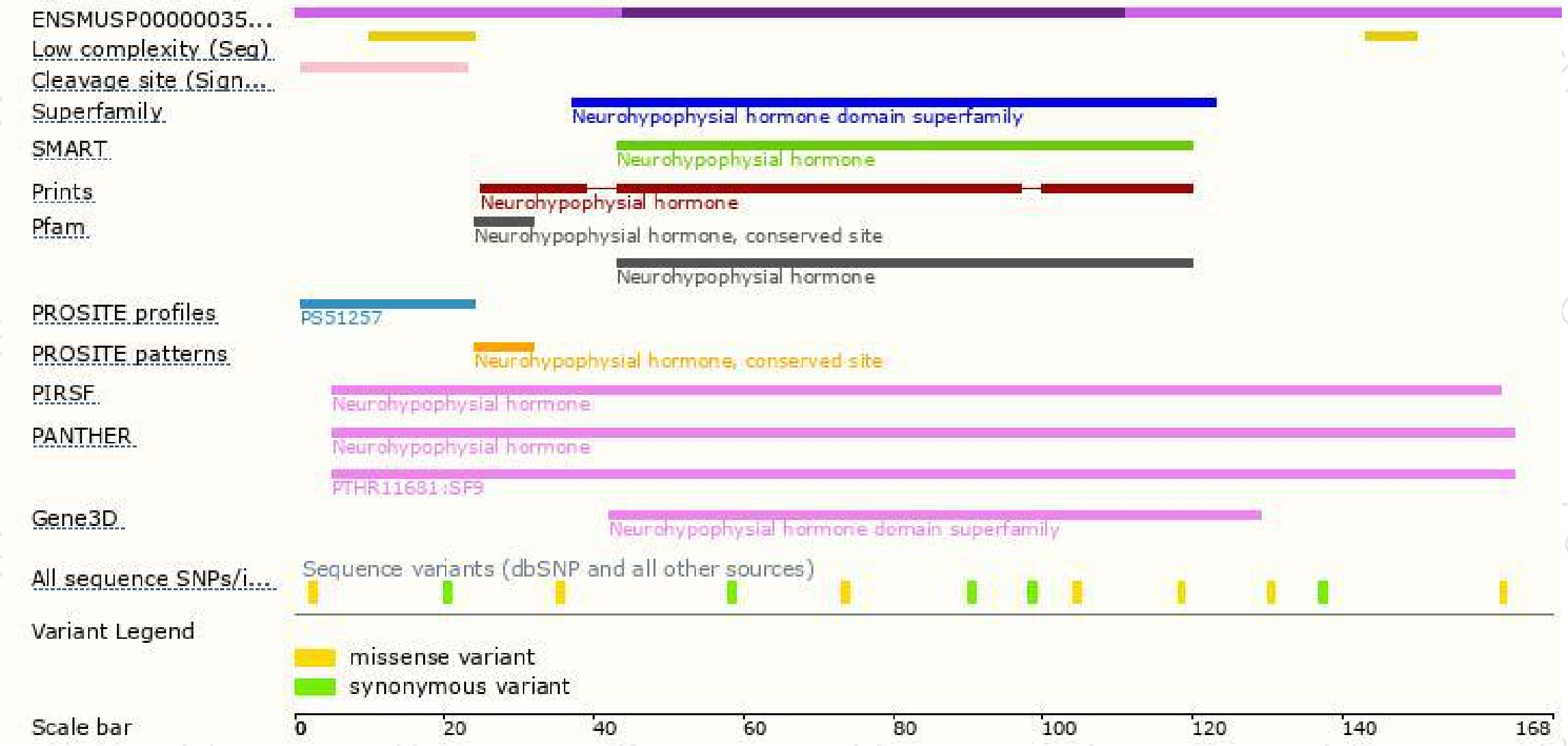
The strategy is based on the design of *Avp-201* transcript,the transcription is shown below:



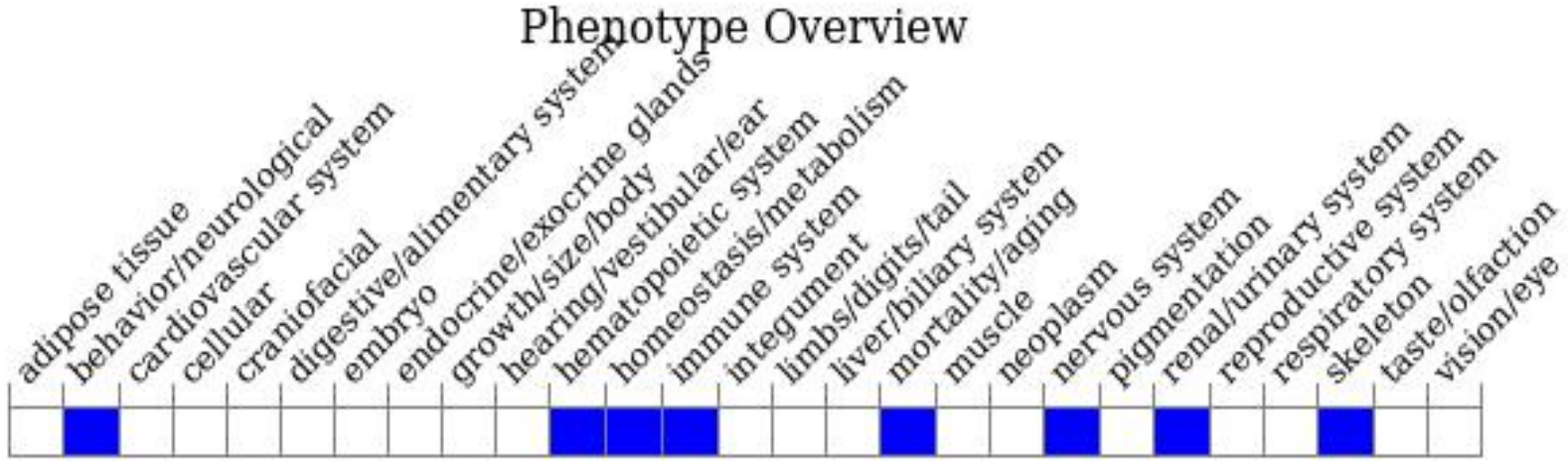
Genomic location distribution



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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