Overview

Also Known As: SYNGAP1^fl

The SYNGAP1^fl floxed allele has loxP sites flanking exons 6-7 of the synaptic RasGAP (SynGAP) gene. Removal of the floxed
sequence disrupts expression of full-length SynGAP and results in expression of a truncated/inactive SynGAP protein. These mice may be useful in Cre-lox studies of synapse development (specifically in dendritic spine), cognitive and behavioral maturation, intellectual disability and autism spectrum disorder.

Donating Investigator
Gavin Rumbaugh, The Scripps Research Institute

**GENETIC OVERVIEW**

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
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<tbody>
<tr>
<td><strong>Syngap1&lt;sup&gt;tm1.1Geno&lt;/sup&gt;</strong></td>
<td></td>
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<tr>
<td>Allele Type</td>
<td>Gene Symbol</td>
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<tr>
<td>Targeted (Conditional ready (e.g. floxed), No functional change)</td>
<td><strong>Syngap1</strong></td>
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**RESEARCH APPLICATIONS**

Neurobiology Research  
Research Tools  
Developmental Biology Research

**BASE PRICE**
Starting at:

$2,854.50 Domestic price Cryo Recovery

**Details**

Mutations that cause intellectual disability (ID) and autism spectrum disorder (ASD) are commonly found in genes that encode for synaptic proteins. *Syngap1* encodes a synaptic RasGAP (SynGAP) that is largely localized to dendritic spines in neocortical pyramidal neurons, where it suppresses signaling pathways linked to NMDA receptor (NMDAR)-mediated synaptic plasticity and...
AMPAR receptor (AMPAR) membrane insertion. Synap1 has alternative transcriptional start sites and several alternatively spliced C-terminal exons that result in many possible SynGAP isoforms. Human SYNGAP1 haploinsufficiency results from a truncation of the full-length protein. Exon 7 contains the first common methionine present in the shortest splice variant.

The SYNGAP1<sup>fl</sup> allele has flox sites flanking exons 6-7 of the Synap1 gene. Mice homozygous for the SYNGAP1<sup>fl</sup> allele are viable and fertile with no reported abnormalities. When bred to mice that express Cre recombinase, the resulting offspring may be useful in generating tissue-specific disruption of full-length SynGAP and expression of a truncated/inactive SynGAP protein. For example, when SYNGAP1<sup>fl</sup> are bred to germline Cre-expressing mice, the resulting heterozygous offspring express a SynGAP protein truncated after exon 5 (known to be an inactive SynGAP protein), as well as diminished levels of functional SynGAP (from the wildtype allele). Therefore, the heterozygous phenotype is the same as mice heterozygous for the global knockout allele, and both are a model of human SYNGAP1 haploinsufficiency - exhibiting normal synaptic transmission, modest defects in synaptic plasticity, enhanced synaptic function (accelerated rate of glutamatergic synapse maturation) during early neural development and profound cognitive and behavioral abnormalities. Specifically, heterozygous SynGAP-deficiency significantly disrupts excitatory/inhibitory (E/I) balance in the neural networks that support cognition and behavior. Abnormal behavioral phenotypes can be observed as early as 21 days of age with ~100% penetrance (although physiological abnormalities can be measured even earlier through other methods such as electrophysiological recordings). Furthermore, mice homozygous for the germline deletion of exons 6-7 are phenotypically the same as global knockout homozygotes - exhibiting complete postnatal lethality between 2-5 days of age.

In addition, to explore the behavioral contribution of in vivo Synap1 dysfunction in distinct cellular populations, SYNGAP1<sup>fl</sup> mice may be bred to Emx1<sup>IRES-cre</sup> mice (forebrain glutamatergic neurons and glia; Stock No. 005628), Gad2-IRES-Cre mice (developing GABAergic neurons; see Stock Nos. 010802 / 028867) and/or PV-Cre mice (parvalbumin-positive neurons; see Stock Nos. 008069 / 017320).
Related Products and Services

Frozen Mouse Embryo

STOCK Syngap1<tm1.1Geno>/RumbJ

$2595.00

Genotyping Protocols

Standard PCR: Syngap1<tm1.1Geno>

Genotyping resources and troubleshooting

Breeding Considerations

Mice homozygous for the floxed allele are viable and fertile with no reported abnormalities. When maintaining a live colony, heterozygous mice may be bred together, to wildtype mice from the colony or to C57BL/6J inbred mice (Stock No. 000664). Alternatively, homozygous mice may be bred together.

Additional Breeding and Husbandry Support

Mating System

Homozygote x homozygote

Citation

When using the SYNGAP1<tm1.1Geno> mouse strain in a publication, please cite the originating article(s) and include JAX stock #029303 in your Materials and Methods section.

Animal Health Reports

Facility Barrier Level Descriptions

Production of mice from cryopreserved embryos or sperm occurs in a maximum barrier room, G200

Pricing & Availability

Cryo Recovery

Typically mice are recovered in 10-14 weeks. Contact Customer Service to place an order or for more information.

Domestic Pricing

<table>
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<th>SERVICE</th>
<th>GENOTYPE</th>
<th>PRICE</th>
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<tr>
<td>Cryo Recovery</td>
<td>Heterozygous for Syngap1&lt;tm1.1Geno&gt;</td>
<td>$2,854.50</td>
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</tbody>
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We will fulfill your order by providing at least two carriers for each strain ordered. The total number, sex, and genotypes provided will vary, although typically 8 or more animals are provided. Please check genotypes which will be recovered. While the genotypes of all animals produced will be communicated to you prior to scheduling shipment, the genotypes of animals provided may not reflect the mating scheme and genotypes described in the strain description. Animals are typically ready to ship in 11-14 weeks. If a second recovery is required to produce the minimum number of animals, then delivery time would increase to approximately 25 weeks. If we fail to produce animals of the correct genotype, you will not be charged. We cannot guarantee the reproductive success of mice shipped to your facility. If the mice are lost after the first three days (post-arrival) or do not produce progeny at your facility, a new order and fee will be necessary.

Cryorecovery to establish a Dedicated Supply for greater quantities of mice. Mice recovered can be used to establish a dedicated colony to contractually supply you mice according to your requirements. Price by quotation.

Payment Terms and Conditions

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