Longjohn 3 Jackson (*lgj-3J*); a remutation in the *Npr3* gene

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Mutation (allele) symbol: $Npr3^{lgj\text{-}3J}$

Mutation (allele) name: longjohn 3 Jackson

Gene symbol: *Npr3*

Strain of origin: C57BL/6J

Current strain name: C57BL/6J-$Npr3^{lgj\text{-}3J}$/GrsrJ

Stock #008188 (jaxmice.jax.org)

Phenotype categories: skeleton/limbs

Abstract
This new spontaneous remutation has been identified and mapped to Chromosome 15 in the same region as $Npr3^{lgj}$. A direct test for allelism was set up with $Npr3^{lgj\text{-}2J}$ and the results confirmed that this new mutation is a remutation of *Npr3*.

Origin and Description
The $Npr3^{lgj\text{-}3J}$ mutation arose at the Jackson Laboratory in a colony of C57BL/6J mice in 2005 and was discovered by Sara C. Connolly. Like the previously described longjohn (*lgj*) mutation, homozygous $Npr3^{lgj\text{-}3J}$ mutant mice are easily distinguishable as early as 5-7 days of age by their elongated bodies, kinked tails and conical extension of the body. Older homozygous mice are thinner than their littermates and display severe thoracic kyphosis and their digits are often banded, twisted and deformed. Mice carrying the $Npr3^{lgj\text{-}3J}$ mutation are viable and fertile.

Genetic Analysis
Using our standard MMR mapping procedures, a mouse homozygous for the $Npr3^{lgj\text{-}3J}$ mutation was mated to a CAST/EiJ mouse. The F1 progeny from this cross were then intercrossed and produced 53 affected mice of which 21 were utilized for linkage analysis. The $Npr3^{lgj\text{-}3J}$ mutation maps to Chromosome 15 proximal to *D15Mit131* (NCBI 36 position 30.3 Mb) and is non-recombinant with *D15Mit12* (NCBI 36 position 3.16 Mb), *D15Mit11* (NCBI 36 position 9.6 Mb), and *D15Mit177* (NCBI 36 position 12.3 Mb). Based on phenotype and map position similarities, a direct test for allelism test was set up by mating an $Npr3^{lgj\text{-}3J}$ homozygous female with an $Npr3^{lgj\text{-}2J}$ heterozygous male. This

mating produced 13 pups of which 4 had the mutant phenotype proving allelism.

Pathology

Our standard pathological screen of two *Npr3*$^{lgj\text{-}3J}$ mutant mice at 6 weeks of age reports no lesions. Hearing assessment by auditory brainstem response testing (ABR) of two *Npr3*$^{lgj\text{-}3J}$ mutant mice and two controls, all at 3 months of age, showed that both controls had normal hearing, one mutant had a mild hearing loss and the other mutant had severe hearing loss. ABR testing performed on four *Npr3*$^{lgj\text{-}3J}$ mutant mice at 3.5 months of age and two *Npr3*$^{lgj\text{-}3J}$ mutant mice at 5 months of age showed all with elevated thresholds at all frequencies.

The eyes of two *Npr3*$^{lgj\text{-}3J}$ mutant mice were electroretinogram (ERG) tested at age 5.5 months and were normal. The eyes of two homozygous *Npr3*$^{lgj\text{-}3J}$ mice at 7 months of age were examined with an ophthalmoscope, and the results were normal except one eye had a cornea.

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