A new allele of myosin XV (*Myo15*)

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Source of Support: This research was supported by NIH/NCRR grant RR01183 to the Mouse Mutant Resource (M.T. Davisson, PI), NIH/NIDCD grant DC04301 (KR Johnson, PI), and *Summer Student internship program, supported by: The Clark Endowment, The Horace W. Goldsmith Foundation, and Elizabeth S. Russell Scholarship Fund.

Mutation (allele) symbol: *Myo15*$^{sh2\text{-}3J}$

Mutation (allele) name: shaker 2, 3 Jackson

Gene symbol: *Myo15*

Strain of origin: C57BL/6J

Current strain name: C57BL/6J-*Myo15*$^{sh2\text{-}3J}$/J

Stock #005218

Phenotype categories: neurological/behavioral: motor capabilities / coordination/ movement anomalies / deafness/head bobbing

Origin and Description
Mutant mice were obtained from the NIH-funded Neuroscience Mutagenesis Facility at the Jackson Laboratory in August 2000. The mutant mice exhibit a head bobbing and moderate circling behavior and a failure to swim. Auditory-evoked brain stem response (ABR) analysis determined that phenotypic mutant mice are deaf. The mode of inheritance was determined to be autosomal recessive and the strain of origin was C57BL/6J.

Genetic Analysis
F1 hybrids produced by mating a CAST/Ei female mouse with a homozygous mutant male were intercrossed and a total of 57 phenotypic mutant F2 mice were collected. Using our standard mapping procedure, the mutation was mapped to the region of Chromosome 11 where the *Myo15* gene is located. A complementation test was performed between a female mouse heterozygous for the new mutation and a mutant male homozygous for the shaker 2, 2 Jackson, mutation of the *Myo15* gene. The test cross produced a total of 10 phenotypic mutant mice out of a total of 17 progeny from three litters, thus confirming allelism.

Pathology
Auditory brain stem response was performed on four homozygous mutants and four heterozygous controls at three months of age and three homozygous mutants at one month of age. The homozygotes were completely deaf while the heterozygotes retained good hearing.

The Mouse Mutant Resource standard pathology screen of a 7-month-old mutant mouse

revealed no lesions in major organs, except for the inner ear. An absence of hair cells and a reduced number of spiral ganglion cells were observed in the mutant inner ear as compared to a control. Examination of whole-mount preparations of inner ears from three homozygous mutants revealed no gross morphological changes and the presence of normal otoconia in the vestibular maculae.

Discussion

Shaker 2 and shaker 2^{2J} were previously identified as mouse mutations in the *Myo15* gene. The human ortholog of unconventional myosin XV has been described as the gene that underlies the human sensorineural hearing disorder DFNB3. Therefore, the new shaker 2, 3 Jackson, ($Myo15^{sh2\text{-}3J}$) mouse mutation of *Myo15* described here provides an additional mouse model for this human hereditary hearing impairment disorder.

Acknowledgements

We thank Rod Bronson and Coleen Marden for pathological screening and Heping Yu and Norm Hawes for assistance in phenotypic characterization.

References

MGD 2005, Mouse Genome Database, Mouse Genome Informatics Project, The Jackson Laboratory, Bar Harbor, ME. (URL: www.informatics.jax.org)