New spontaneous mutation in the Wheels region

Leona H Gagnon, Sandra J. Gray, Ken R. Johnson

Source of Support: This research was supported by NIH/NCRR grant RR01183 to the Mouse Mutant Resource (M.T. Davisson, PI) and DC04301 (K.R. Johnson. P.I.)

Mutation (allele) symbol: *Whll*

Mutation (allele) name: wheels-like

Gene symbol: *Whll*

Strain of Origin: C57L/J

Current strain name: B6.L-*Whll*/J

Stock #004620 (jaxmice.jax.org)

Phenotype categories: moderate circler, mild hearing impairment

Origin and Description

The dominant mutation wheels-like (*Whll*) arose spontaneously in the C57L/J inbred strain. Due to poor viability, male mutants were backcrossed to C57BL/6J and the strain is now maintained by mating female C57BL/6J mice to male *Whll*/+ mutants. ABR test results showed that heterozygous mutants have a 10 - 25 dB hearing impairment compared with +/+ littermate controls, but are not deaf.

ABR Thresholds for click, 8 kHz, 16 kHz, and 32 kHz stimuli

Genotype	Age (days)	Sex	Click	8 kHz	16 kHz	32 kHz
+/+	66	f	40	35	15	40
+/+	66	f	40	35	15	40
+/+	66	m	35	35	15	45
+/+	85	f	35	30	15	45
+/+	85	f	40	35	15	50
+/+	85	m	40	35	15	45
+/+	**Average**		**38**	**34**	**15**	**44**
Whll/+	66	f	50	65	30	70
Whll/+	66	m	50	55	30	70
Whll/+	85	f	45	55	30	60
Whll/+	85	m	50	65	35	60
***Whll*/+**	**Average**		**49**	**60**	**31**	**65**

Genetic Analysis

Mutant F1 hybrids with CAST/Ei were backcrossed to C57BL/6J mice (+/+), and 25 N2 generation animals were analyzed for linkage. The new mutation was localized to Chromosome 4, proximal to *D4Mit5* (3/25 recombinants), and non-recombinant with

D4Mit235, D4Mit181, and *D4Mit315*. This map location corresponds with that of wheels (*Whl*), a previously described dominant mutation with a similar heterozygous phenotype. Because the map position, inheritance, and phenotype of the new mutation matched that of wheels, we presumed it to be allelic and named it wheels-like (*Whll*).

Acknowledgements
We thank Julia Stadler for identification of the first mutant, Susan Cook and Ken Bosom for colony establishment and maintenance, and Coleen Marden, Heping Yu, Qing Yin Zheng and Norm Hawes for their technical expertise.