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Genetical and Pathological Studies on the Mutant Mice as an Animal Model for Deafness Disease

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A new neurological mutant has been found in the ICR outbred strain mouse. Affected mice display profound deafness and a head-tossing and bidirectional circling behavior, showing an autosomal recessive mode of inheritance. It was, therefore, named *cir*/Kr with the gene symbol *cir*. The auditory tests identified clearly the hearing loss of the *cir* mice when compared to wild type mice. Pathological studies confirmed the developmental defects in the middle ear, cochlea, cochlear nerve, and semicircular canal areas, which were correlated to the abnormal behavior observed in the cir mice. Thus, cir mice may be useful as a model for studying inner ear abnormalities and deafness. We have constructed a genetic linkage map by positioning 14 microsatellite markers across the (*cir*) region and intraspecific backcross between *cir* and C57BL/6J mice. The *cir* mouse harbors an autosomal recessive mutation on mouse chromosome 9. The *cir* gene was mapped to a region between *D9Mit116* and *D9Mit38*. Estimated distances between cir and *D9Mit116,* and between *cir* and *D9Mit38* are 0.7 and 0.2 cM, respectively. The gene in order was defines: centromere-*D9Mit182-D9Mit51/D9Mit79/D9Mit310-D9Mit212/D9Mit184-D9Mit116-cir-D9Mit38-D9Mit20-D9Mit243-D9Mit16-D9Mit55/D9Mit125- D9Mit281*. The mouse map location of the cir locus appears to be in a region homologous to human 3q21. Our present date suggest that the nearest flanking marker *D9Mit38* provides a useful anchor for the isolation of the *cir* gene in a yeast artificial chromosome contig.

(Key words) **Neurological Mutant Mice, *cir*/Kr, Autosomal Recessive Mode, Microsatellite Markers.**