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Studies on the Genetic Linkage of Bilirubin and Androsterone UDP-Glucuronyltransferases by Cross-breeding of Two Mutant Rat Strains*

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Gunn rats, which have defects in bilirubin and 4-nitrophenol UDP-glucuronyltransferase (GT), were crossed with LA Wistar rats, which have a defect in androsterone GT. The F_1 hybrids showed normal GT activities towards androsterone, bilirubin and 4-nitrophenol, demonstrating that Gunn and LA (low activity) Wistar rats inherit a homozygous dominant trait for androsterone GT and bilirubin GT, respectively. The F_2 offsprings showed four different combinations of bilirubin and androsterone GT activities : defects in both GT activities, a single defect in bilirubin GT activity, a single defect in androsterone GT activity and two normal GT activities. They were segregated in the approximate ratio of 1 : 3 : 3 : 9, which is compatible with Mendel's Principle of Independent Assortment. These results provide evidence that androsterone GT and bilirubin GT are located on different chromosomes. In the F_2 generation, defective bilirubin and 4-nitrophenol GT activities were not segregated, indicating that these two mutant genes are closely linked on the same chromosome.

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