

## Developmental Biology

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A large targeted deletion of *Hoxb1-Hoxb9* produces a series single-segment anterior homeotic transformationsOlga Medina-Martínez<sup>\*</sup> ... Ramiro Ramírez-Solis<sup>\*, ‡, §, ¶</sup> [Show more](#)<https://doi.org/10.1006/dbio.2000.9683>[Get rights and content](#)Under an Elsevier [user license](#)[open archive](#)

*Hox* genes regulate axial regional specification during animal embryonic development and are grouped into four clusters. The mouse *HoxB* cluster contains 10 genes, *Hoxb1* to *Hoxb9* and *Hoxb13*, which are transcribed in the same direction. We have generated a mouse strain with a targeted 90-kb deletion within the *HoxB* cluster from *Hoxb1* to *Hoxb9*. Surprisingly, heterozygous mice show no detectable abnormalities. Homozygous mutant embryos survive to term and exhibit an ordered series of one-segment anterior homeotic transformations along the cervical and thoracic vertebral column and defects in sternum morphogenesis. Neurofilament staining indicates abnormalities in the IXth cranial nerve. Notably, simultaneous deletion of *Hoxb1* to *Hoxb9* resulted in the sum of phenotypes of single *HoxB* gene mutants. Although a higher penetrance is observed, no synergistic or new phenotypes were observed, except for the loss of ventral curvature at the cervicothoracic boundary of the vertebral column. Although *Hoxb13*, the most 5' gene, is separated from the rest by 70 kb, it has been suggested to be expressed with temporal and spatial colinearity. Here, we show that the expression pattern of *Hoxb13* is not affected by the targeted deletion of the other 9 genes. Thus, *Hoxb13* expression seems to be independent of the deleted region, suggesting that its expression pattern could be achieved independent of the colinear pattern of the cluster or by a regulatory element located 5' of *Hoxb9*.

## Key Words

chromosomal engineering; *Hox* clusters; large targeted deletion



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