

**Role for Homeodomain-Interacting Protein Kinase (HIPK)
on the Corepressor Activity of Groucho During
Drosophila Development**

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Groucho function is essential for *Drosophila* development, acting as a corepressor for transcription factors that are downstream targets of various signaling pathways. Here we provide evidence that Groucho is phosphorylated by the DHIPK2 protein kinase. Phosphorylation modulates Groucho corepressor activity by attenuating its protein-protein interaction with a DNA-bound transcription factor. During eye development, DHIPK2 modifies Groucho activity and eye phenotypes generated by forced expression of Groucho differ depending on its phosphorylation state. Furthermore, size fractionation of nuclear extracts of embryos by column chromatography, followed by Western blot analysis shows that phospho-Groucho associates poorly with the corepressor complex, whereas the unphosphorylated form binds tightly. We propose that Groucho phosphorylation by DHIPK2, and its subsequent dissociation from the corepressor complex, transduce extracellular signals that relieve the Groucho-mediated transcriptional repression of target genes during development.