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Neha Gogia
University of Dayton, stander@udayton.edu

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Role of axial patterning genes in growth regulation during eye development

Neha Gogia¹, Madhuri Kango-Singh¹,²,³
Amit Singh¹,²,³

1) Department of Biology, University of Dayton, 300 College Park Drive, Dayton, OH; 2) Premedical Program, University of Dayton; 3) Center for Tissue Regeneration & Engineering (TREND), University of Dayton, 300 College Park Drive, Dayton, OH.

Abstract

An important step in developmental biology is how axial patterning genes work in growth and patterning to form unique 3D structures, including eyes. In Drosophila, axis determination is achieved through the interaction of the dorsal organizer and the Hox genes. The key players are dve and pnr which are known to determine the eye-antennal region. The current study investigates the role of dve and pnr in growth regulation during eye development. These genes play a crucial role in the regulation of growth through the Hippo pathway. The results suggest that the loss-of-function of these genes leads to an increase in eye size, while the gain-of-function leads to a decrease in eye size. This study provides a better understanding of the molecular mechanisms underlying eye development and growth regulation.

Conclusions:

- *dve* and *pnr* play important roles in growth regulation during eye development.
- Loss-of-function of *dve* and *pnr* may suppress hippo signaling in their expression domain to determine head specific fate.
- LOF of *dve* and *pnr* may activate ectopic hippo signaling in dorsal cells which results in downregulation of wingless in these cells and leads to change of head to eye specific fate.
- Both these pathways may interact with each other by regulating Wg signaling.

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