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Study of segmental regeneration and healing of ventral nerve cord in *Eisenia fetida*

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Abstract : *The regeneration in a lumbricid earthworm, Eisenia fetida was studied by amputating the earthworms at different regions. Also, the healing of Ventral Nerve Cord (VNC) was studied in them by using Rapid Escape Response (RER) Assay. Further the role of an extracellular pathway, namely the Wnt/β- catenin in the regeneration of earthworms was verified using the chemicals Lithium Chloride (LiCl) and Sodium Chloride (NaCl).*

Keywords : *Regeneration , Amputation , Ventral Nerve Cord, Rapid Escape Response , Wnt/β- cateninin.*

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Introduction :

Earthworms are extremely important in the formation and maintenance of soil structure and turnover of dead organic matter. Therefore, the factors that affect their survival are important in their ecology. Regeneration is a process in which damaged tissues grow again. Annelids exhibit extensive variation in their regenerative ability (Bely and Sikes, 2010). Earthworms are unique and valuable model to study regeneration (Park et.al., 2013). Among earthworms, the lumbricid earthworm *Eisenia fetida* has been used commonly for research, because it is easy to culture and handle them in the laboratory.

The earthworm, *Eisenia fetida* shows sensitivity towards various chemicals in the environment (Edwards and Bohlen, 1996). Ventral Nerve Cord (VNC) is a vital part of the nervous system of the earthworm that is involved in motor coordination. It consists of the medial giant axon (MGA) and two electrically coupled lateral giant axon (LGA). Rapid Escape Response (RER) in *Eisenia fetida* can be used to study the regeneration in the Ventral Nerve Cord (VNC) (Drewes et al., 1988).